

Emotion Dysregulation, Impulsivity, Mindfulness, and Attachment Orientation in People
with Symptoms of Bulimia Nervosa and Binge Eating Disorder.

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Abstract

Emotion dysregulation has been implicated in over half the DSM-IV Axis I diagnoses and all the Axis II disorders, and greater dysregulation has been associated with more severe psychopathology in clinical populations (Bradley, 2003; Fischer, Smith, Spillane, & Cyders, 2005; Gross, 1998; Hayes, Wilson, Strosahl, Gifford, & Follett, 1996). Despite this, there is still much research to do in order to understand the causes of emotion dysregulation and to consider its association with other theories that incorporate perspectives on emotional recognition and regulation, such as mindfulness.

In some theories emotion dysregulation is believed to stem from poor quality early attachment relationships (Bowlby, 1962/69, 1973, 1980) which are believed to affect both inter- and intra-personal functioning. For example, individuals receiving mental health treatment tend to have higher proportions of individuals with attachment insecurity than community populations. Moreover, individuals with greater attachment insecurity have been found to resort to binge eating and purging which are sometimes referred to as *secondary attachment strategies* (Evans & Wertheim, 2005; Flores, 2004; Mikulincer, Shaver, & Pereg, 2003; Orzolek-Kronner, 2002; Polivy & Herman, 2002; Schore, 2003; Zvolensky & Forsyth, 2002). Binge eating and purging have also been associated with impulsivity in general, but may actually be more closely aligned with ‘urgency’, a facet of impulsivity (Fischer, Smith, Spillane, & Cyders, 2005).

Attachment insecurity, emotion dysregulation and impulsivity have all been associated with bulimia nervosa and binge eating disorder (Cassin & von Ranson, 2005; Claes, Vandereycken, & Vertommen, 2005; Polivy & Herman, 2002). However, relatively few treatments for these disorders focus on addressing emotion dysregulation

or impulsivity. The current treatment of choice, cognitive behavioural interventions, report relatively low rates of complete recovery and have high relapse rates (Openshaw, Waller, & Sperlinger, 2004). Mindfulness-based interventions have gained increasing recognition as promising treatments for disorders of emotion dysregulation, impulsivity, and eating disorders with a binge component e.g. Dialectical Behaviour Therapy (Linehan, 1993; Safer, Telch & Agras, 2001) and MB-EAT (Kristeller & Hallett, 1999). It has been suggested that mindfulness interventions are used for disorders of emotion dysregulation (Sloan & Kring, 2007).

In the two studies reported here, the general purpose was to examine the relationships between the primary variables of emotion dysregulation, impulsivity, mindfulness, and eating disorder symptoms and to examine how they are associated with the secondary variables of mood, attachment orientation, and general dysfunction. An additional purpose in the second study was to test the impact of a mindfulness intervention on primary variables, mood, and general dysfunction for women with bulimia nervosa or binge eating disorder. Relationships between variables were examined first in a university sample of males and females (Study 1; $N = 199$), then associations between variables were tested with pre-treatment data collected from females attending the mindfulness treatment (Study 2a; $N = 55$). A further study (Study 2b; $N = 51$), assessed pre-treatment to post-treatment change in emotion dysregulation, mindfulness, and eating disorder symptoms for the 8-week mindfulness intervention.

In Study 1, greater emotion dysregulation and less mindfulness were consistently associated with poor psychological functioning. Attachment insecurity was uniquely significantly related to eating disorder symptoms. Urgency was significantly related to

emotion dysregulation and eating disorder symptoms. Impulsivity was uniquely related to emotion dysregulation but not to eating disorder symptoms.

In Study 2, emotion dysregulation, mindfulness and poor psychological functioning were consistently related. Attachment orientation was not significantly related to emotion dysregulation or eating disorder symptoms. Urgency was significantly and uniquely related to emotion dysregulation and eating disorder symptoms but impulsivity was not. Post mindfulness intervention participants reported significant improvements on all measures of poor psychological functioning except impulsivity.

The findings from the studies indicate that emotion dysregulation has a pervasive effect on multiple psychological difficulties (Aldeo, Noelen-Hoeksema, & Schweizer, 2009; Bradley, 2003; Gratz & Roemer, 2004; Smith, Fischer, Cyders, Annus, Spillane & McCarthy, 2007).

Results suggested that mindfulness may be a means of emotion regulation and indicated that mindfulness interventions could be effective for disorders of emotion regulation. When treating people with eating disorders, it is possible that the length of mindfulness practice may need to be extended and more comprehensive mindfulness skills taught to address impulsivity as well as the eating disordered cognitions related to body dissatisfaction and drive for thinness.

The emotion dysregulation, mindfulness and eating disorder literature would benefit from examining these relationships in a longitudinal design to establish direction of causation. Examining ways in which either an adaptation of mindfulness skills or alternative treatment modalities could improve impulsivity would benefit not only eating

disordered individuals but could generalise to all disorders where emotion dysregulation and impulsivity were comorbid.

STATEMENT OF ORIGINALITY

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Michelle Hanisch

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Chapter 1

Introduction and Overview

Emotion regulation difficulties have been implicated in over half the DSM-IV Axis I diagnoses and all the Axis II disorders (Gross, 1998). It has been suggested that deficits in the ability to identify, manage, and regulate emotions underlies all psychopathology (Bradley, 2003). Research also demonstrates that emotion dysregulation and related concepts (experiential avoidance, and the *urgency* facet of impulsivity) have been associated with more severe psychopathology in clinical populations (Eftekhari, Zoellner, & Vigil, 2008; Fischer, Smith, Spillane, & Cyders, 2005; Hayes, Wilson, Strosahl, Gifford, & Follett, 1996).

Individuals with dysregulated emotions and maladaptive emotion regulation strategies suffer across a range of areas. They tend to have high intensity of negative emotions, have slower decay of negative emotions, and have fewer internal resources available for repairing and regulating negative emotional states (Diamond & Aspinwall, 2003; Eftekhari, Zoellner, & Vigil, 2008; Schulman, Augustine, & Hemenover, 2006). Advancing theory of emotion regulation, with the aim of better informing treatment for individuals with emotion regulation difficulties, is clearly important in order to assist in reducing suffering as a result of emotion dysregulation.

Although there is certainly evidence that physiology and early temperamental traits play a role in emotion dysregulation (Diamond & Aspinwall, 2003; Levine, Marziali, & Hood, 1997; Schore, 2003), there is also evidence that emotion dysregulation stems from early social experiences, particularly early attachment relationships (Bowlby, 1962/69, 1973, 1980). Attachment theory is considered one of the most important

conceptual frameworks for understanding the process of emotion regulation (Mikulincer, Shaver, & Pereg, 2003). A secure attachment orientation has been associated with improved general functioning, low levels of depression, anxiety and hostility, few somatic symptoms, high quality and satisfying relationships, better performance in career and work roles (Shaver & Mikulincer, 2007) and may therefore be a protective factor against poor psychological functioning, emotion dysregulation and impulsivity. Both emotion dysregulation and impulsivity are believed to be affected by an individual's adult attachment system (Scott, Levy, & Pincus, 2009) and it has been consistently found that clinical populations have higher proportions of insecurely attached, and emotionally dysregulated individuals than non-clinical populations (Evans & Wertheim, 2005; Orzolek-Kronner, 2002; Polivy & Herman, 2002; Schore, 2003).

In contrast to securely attached individuals, individuals with an insecure attachment orientation have been found to be emotionally dysregulated and have poor psychological health outcomes (e.g. high levels of depression, anxiety, and hostility, less internal coherence, and less satisfying and lower quality relationships; Shaver & Mikulincer, 2007). They also have a tendency to resort to secondary attachment strategies such as binge eating and purging, substance abuse, and deliberate self-harm to regulate emotions when there is a belief in the unavailability of attachment figures to provide relief from distress (Flores, 2004; Mikulincer, Shaver, & Pereg, 2003; Orzolek-Kronner, 2002; Zvolensky & Forsyth, 2002). While these behaviours have historically been associated with impulsivity, there is a growing body of research that suggests that they are associated with emotion dysregulation and a particular facet of impulsivity called *urgency* (the tendency to engage in impulsive behaviour in order to alleviate negative

affect (Fischer, Smith, Spillane, & Cyders, 2005). However, the relationship between urgency and emotion dysregulation has not been previously explored and changes to urgency have not been examined pre-to-post intervention. Additionally, examining the relationships between impulsivity, emotion dysregulation and attachment orientation has not been investigated. If attachment orientation was highly related to impulsivity, and especially urgency, there would be support for the theory of impulsive behaviours as secondary attachment strategies. Understanding the nature of these relationships would advance theory of both urgency, which is a relatively new construct, and add to the burgeoning emotion regulation literature. Through advancing theory more effective treatment options could be developed.

In addition to exploring the relationships between emotion dysregulation, impulsivity and attachment orientation, it has been suggested that investigation of the relationships between emotion regulation, impulsivity and binge eating disorders is warranted (Stratton, 2006). Bulimia nervosa (BN) is a disorder characterised by both impulsivity and emotion dysregulation (Polivy & Herman, 2002). Binge eating and bulimia are believed to be misguided attempts at emotion regulation or maladaptive emotion regulation strategies (Aldeo, Noelen-Hoeksema, & Schweizer, 2009; Flores, 2004). Individuals with eating disorders, and specifically bulimia, also have a higher representation of insecure attachment orientation than non-clinical populations (Polivy & Herman, 2002; Ward, Ramsay, & Treasure, 2000). Individuals with binge eating disorder (BED) share similar characteristics to individuals with bulimia (Davis, et al., 2008; Fairburn, Cooper, & Shafran, 2003; McElroy & Kotwal, 2006; Julyanna, 2007).

Relatively few treatments for these disorders focus on addressing emotion regulation or impulsivity (Fischer, et al., 2004). Most have been based on cognitive-behavioural models which place negative self-evaluations based on weight and eating-related behaviour as the core psychopathology of the disorders (Fairburn, Cooper, & Cooper, 1986). Cognitive behavioural interventions, the current treatment of choice, are not considered sufficiently effective, with treatment participants having low rates of complete recovery and high rates of relapse (Openshaw, Waller, & Sperlinger, 2004). If emotion dysregulation provides the platform, and impulsivity is a secondary strategy for managing emotional distress, addressing food and weight related cognitions alone may not provide the most effective treatment strategy. It has been suggested that cognitive treatments for people with eating disorders are useful but not necessary elements to treatment (Blouin, et al., 1994), and that several risk factors for eating disorders need to be examined simultaneously in order to achieve a comprehensive understanding of the processes involved in eating disorders (Kiang & Harter, 2005). Examining multiple risk factors (emotion dysregulation, impulsivity, insecure attachment orientation, mood disturbance, and general dysfunction) is thus suggested in the literature to contribute to a more comprehensive understanding of these processes.

While emotion dysregulation, impulsivity, insecure attachment orientation, mood disturbance, and general dysfunction are considered risk factors for eating disorders, and more generally for poor psychological functioning, mindfulness research indicates that mindfulness may be a protective factor (Chambers, Gullone, & Allen, 2009; Coffey & Hartman, 2008; Leahey & Crowther, 2008). Mindfulness-based interventions have gained increasing recognition as promising treatments for disorders of emotion dysregulation,

impulsivity, and eating disorders with a binge component e.g. Dialectical Behaviour Therapy (Linehan, 1993; Safer, Telch & Agras, 2001) and MB-EAT (Kristeller & Hallett, 1999). Mindfulness is hypothesised to assist emotion regulation, impulsivity and disordered eating through increasing the ability for adaptive, flexible responding to events, with greater acceptance and tolerance of emotional distress (Bishop, et al., 2004; Kabat-Zinn, 1990; Linehan, 1993). Increased tolerance for distress improves the ability to resist impulsive urges while deconditioning habitual destructive responses (Hayes, Strosahl, & Wilson, 1999; Kristeller & Hallett, 1999). Furthermore, the attitudes and skills of mindfulness (non-judgement, non-reactivity, awareness, decentred observation, patience, beginner's mind, self-trust, non-striving, acceptance, and letting go) assist in addressing both the behaviours and cognitions related to bulimia nervosa and binge eating disorder (Baer, Fischer, & Huss, 2006; Kabatznick, 1998; Kristeller & Hallett, 1999; Shapiro, Carlson, Astin & Freedman, 2006; Stewart, 2004). Mindfulness interventions have been suggested as being important in the treatment of disorders of emotion regulation including eating disorders (Sloan & Kring, 2007)

Mindfulness is also hypothesised to be a protective factor through its association with attachment security. Mindfulness and attachment security are reported to share many positive psychological outcomes such as affective self-regulation, insight, and empathy (Siegel, 2005, 2006) as well through an awareness of self from a non-judgemental stance, an openness and acceptance of experience, and the ability to self-soothe (Shaver, Lavy, Saron, & Mikulincer, 2007; Wallin, 2007). An additional shared underlying process is the ability to mentalise or take a reflective stance to experience (Fonagy, Gergeley, Jurist, & Target, 2002; Wallin, 2007). This ability to reflect on mental representations of the

psychological functioning of self is closely tied to attachment style and is believed to improve both emotion regulation and impulsivity (Fossati et al., 2005) and potentially disordered eating. If mindfulness and attachment orientation share strong relationships and therefore similar underlying processes as hypothesised, it is possible that mindfulness interventions may be able to address the deficits to functioning associated with an insecure attachment orientation. Understanding these relationships in more depth will contribute to the theory of both mindfulness, attachment theory, and their relation to emotion dysregulation and impulsivity.

While previous research has examined individual aspects of these proposed relationships, there has been none to date (to the author's knowledge) that examines the relationships between emotion dysregulation, mindfulness, and multiple risk factors for disordered eating (impulsivity, insecure attachment orientation, mood disturbance, and general dysfunction) in both a clinical and non-clinical sample. Investigating the relationships between all these factors will arguably contribute to current theory and assist by informing treatment options. Examination of the ability of a mindfulness intervention to impact emotion dysregulation, impulsivity, mood disturbance, general dysfunction and disordered eating, contributes to the mindfulness, emotion regulation and eating disorder literature, and is speculated to assist in defining which aspects of disorders mindfulness is best applied to.

Overview of the Research Studies

Two studies were conducted. The first study examined associations between the constructs of emotion dysregulation, attachment style, impulsivity, mindfulness, and eating disordered behaviours and cognitions in a non-clinical population.

The second study consisted of two parts. The first examined these same relationships in a clinical population, specifically women who met the criteria for bulimia nervosa or binge eating disorder. Part two of the second study examined the impact of an 8-week mindfulness intervention for women with bulimia nervosa or binge eating disorder. The important outcomes assessed in this intervention were emotion dysregulation, mindfulness, eating disorder symptoms, impulsivity and urgency, and general dysfunction and mood.

More specifically, in Study1, the analyses began with a process of data reduction, which involved combining similar measures or omitting redundant measures. Following this, correlations between variables were examined to test expected relationships between emotion dysregulation, attachment style, impulsivity, mindfulness, and eating disorder symptoms in a non-clinical university population. General dysfunction and a mood composite (depression, anxiety) were included. As insecure attachment orientations are believed to result in emotion dysregulation and emotion dysregulation has been hypothesised to underlie all psychopathology (Bradley, 2003; Mikulincer, Shaver, & Pereg, 2003), it was expected that individuals who reported having more emotion dysregulation would also report having an insecure attachment, poor functioning and more psychological difficulties including eating disordered cognitions and behaviours and impulsivity. As mindfulness is considered the antithesis of emotion dysregulation and has been associated with cognitive and behavioural aspects of a secure attachment orientation (Chambers, Gullone, & Allen, 2009; Fonagy, Gergeley, Jurist, & Target, 2002), it was expected that individuals who reported being more mindful would also

report having a secure attachment orientation and also report having fewer psychological difficulties and better functioning.

Multivariate analyses were performed to examine the unique correlates of (1) emotion dysregulation and (2) eating disorder symptoms. It was expected that an insecure attachment orientation would be significantly uniquely related to emotion dysregulation and eating disorder symptoms as insecure attachment styles are over-represented in eating disordered populations, and emotion dysregulation is believed to be an outcome of early attachment insecurity (Bowlby, 1962/1969, 1973, 1980; Mikulincer, Shaver, & Pereg, 2003). It was predicted that urgency would have a stronger unique relationship to both emotion dysregulation and eating disorder symptoms than the combined impulsivity facets. Urgency has been associated with more psychopathology and problem behaviours in eating disorders and by definition is the emotionally dysregulated aspect of impulsivity (Smith et al., 2007). It was expected that mindfulness would be uniquely associated with both emotion dysregulation and eating disorder symptoms. Mindfulness has been found to be conceptually related to emotion regulation (Chambers, Gullone, & Allen, 2009) and to be inversely related to difficulties experienced by individuals with eating disorders (Leahey & Crowther, 2008).

Study 2a repeated the analyses in a clinical sample with women who met the criteria for bulimia nervosa or binge eating disorder. Similar relationships were expected. Statistical comparisons between the clinical and non-clinical samples were not made as participants were not matched, sample sizes were considerably different, and Study 2 contained women only. However, patterns of relationships were compared and contrasted. The potential for differences in relationships were considered as clinical

populations generally report higher levels of poor psychological and general functioning than non-clinical populations (Schulman, Augustine, & Hemenover, 2006) which may influence how constructs relate to each other. Due to the proposed importance of impulsivity in bulimia nervosa and binge eating disorder (Fischer, Anderson, & Smith, 2004; Reindl, 2001), it was considered that impulsivity may have stronger relationships with eating disordered behaviours and cognitions for individuals in Study 2.

Both Study 1 and Study 2a explored the relationships between subscales of emotion dysregulation, mindfulness and eating disorder symptoms in order to provide a deeper understanding of the relationships that had emerged from existing results. This was largely exploratory and no specific hypotheses about relationships were formed. Study 2b examined the impact of an 8-week mindfulness intervention for women with either bulimia nervosa or binge eating disorder. The intervention was co-developed and co-facilitated by the author. After considering multiple associations and models, mindfulness, emerged as an important protective factor against eating disorder symptoms, which provided a good rationale for its inclusion in treatments for people with eating disorders. The intervention was also assessed for its impact on emotion dysregulation, impulsivity and urgency, general dysfunction and mood problems. Attachment orientation was omitted from this analysis due to the high levels of reported temporal stability and the time limited nature of the intervention (Main, Hesse, & Kaplan, 2005; Scharfe, 2003). Additionally, attachment orientation was not uniquely significantly related to emotion dysregulation or eating disorder symptoms in the clinical sample.

It should be noted that this research was one part of a two-part project investigating mindfulness and eating disorders. The current thesis focused on an

examination of the relationships between variables that have been theoretically linked to eating disorders in both a clinical and non-clinical sample. As indicated, the relationships examined are between the primary variables of emotion dysregulation, impulsivity, mindfulness, and eating disorder symptoms and to examine how they are associated with the secondary variables of mood, attachment orientation, and general dysfunction. An additional purpose in the second study was to test the impact of a mindfulness intervention on primary variables, mood, and general dysfunction for women with bulimia nervosa or binge eating disorder. In contrast, the other part of the overall research program focussed on the mechanisms of change of the mindfulness intervention on a range of eating disorders experienced by the same Study 2 participants (see Morgan 2008).

Summary of Thesis Chapters

Chapter 1: Introduction and overview. A brief review of the literature and an overview of the research studies with rationale and brief hypotheses are presented in this chapter.

Chapter 2: Emotion regulation and dysregulation. This chapter presents a more comprehensive review of the emotion regulation literature including the development of emotion regulation through neurobiology and early attachment relationships. Adult attachment styles and their methods of emotion regulation are reviewed. Theories of impulsivity as a secondary attachment behaviour and an outcome of emotion dysregulation are reported. Impulsivity, and specifically *urgency*, the emotion dysregulation facet of impulsivity, are reviewed.

Chapter 3: Eating disorders – Bulimia Nervosa and Binge Eating Disorder. This chapter includes a description of models of both Bulimia Nervosa and Binge Eating Disorder. Transdiagnostic models of eating disorders are reviewed with a description of sufficient similarities for these disorders to be included in a single treatment program. Specific contributions of emotion dysregulation, impulsivity, and attachment orientation are considered with a review of treatment research relevant to both disorders included.

Chapter 4: Mindfulness. This chapter provides definitions of mindfulness and discusses relationships between mindfulness and emotion regulation, impulsivity, and attachment orientations. Research on relevant mindfulness-based interventions for outcomes related to emotion regulation, impulsivity, or attachment related outcomes is reviewed. A rationale for using mindfulness-based interventions for improving eating disordered symptomatology is provided with a review of the existing mindfulness-based

interventions for eating disorders. The aims and rationale of the current study are presented at the end of this chapter.

Chapter 5: Study 1. This chapter outlines the findings from the examination of the relationships between emotion regulation, impulsivity, attachment orientation, mindfulness and risk for an eating disorder in a non-clinical population. A discussion including the implications of these findings is presented at the end of this chapter.

Chapter 6: Study 2a and 2b. This chapter outlines the results from an examination of the same relationships examined in Study One in a clinical population. Outcomes are reported for an 8-week mindfulness intervention for women with Bulimia Nervosa and Binge Eating Disorder. A discussion of results is included.

Chapter 7: Discussion. This chapter integrates the findings and details theoretical, research, and clinical implications of the research.

Chapter 2

Emotion Regulation and Dysregulation

Emotions and Why They Need Regulation

Essentially, emotions define us as human beings (Flores, 2004). They are universal aspects of human experience that organise the thoughts that shape our priorities, beliefs and convictions. Additionally, emotions are closely tied to our physiology and our sense of relatedness (Flores, 2004). Emotions involve subjective feeling states; cognitions and information processing; expressive displays and behaviour; motivation; and physiological responses that help us adapt to our environment, motivate us to action, or communicate to others (Diamond & Aspinwall, 2003; Greenberg & Johnson, 1988; Gross, 1999).

Others suggest that what psychology calls ‘emotions’ are really several different phenomena that are important to distinguish (Griffiths, 1997). It is suggested that emotions can be categorised and occur in ranges. For example anger, fear, disgust, sadness, joy and surprise are categories and are considered short-ranged emotions. Larger range emotions are viewed from an evolutionary perspective where emotional responses are seen as occurring after a stimulus in an automatic manner. There is some speculation as to whether there is *cognitive* processing between the stimulus and emotional response or whether there is *information* processing via the amygdale-limbic system that bypasses cognitive processing i.e. some emotional responses (physical responses and the associated stimuli) are stored in the limbic system and are readily activated (Griffiths, 1997). While these distinctions are hypothesised as being critical to an understanding and examination of emotions, these distinctions are beyond the scope of this thesis.

Emotions have the function of changing the relationship between the individual and their environment through orienting them towards or away from different objects (Campos, Campos, & Caplovitz-Barrett, 1989; Greenberg & Johnson, 1988). The triggering of an emotion renders the situation more salient so it has the survival enhancing function of signalling that attention needs to be focused on that event in order to organise an adaptive response to it (Clarke & Watson, 1994; Greenberg & Korman, 1993). When an individual experiences intense emotion without emotion regulation, their attention remains primed to that event, which may be associated with extreme and painful emotions thereby increasing the intensity and duration of the distress (Clarke & Watson, 1994). Additionally, when emotions in relation to these events remain unprocessed, they exist as global, undifferentiated states which may make the translation of feelings into appropriate behavioural responses more difficult (Levine, Marziali, & Hood, 1997).

In addition to directing attention to environmental cues, emotions have the function of communicating to others and potentially influencing others through their expression (Linehan, 1993). For example, expressions of sadness generally elicit a comforting response from others while some expressions of anger may be instrumental in coercing others into being co-operative (Johnson, 2004; Linehan, 1993). Clear emotional messages to others are therefore integral to maintaining and enhancing interpersonal relationships (Flores, 2004). Without clear emotional communication, other individuals may not be able to be utilised as emotion regulation resources (e.g. comfort when sad), and may even become further sources of distress (e.g. express fear or anger in response to displays of anger) (Kelner & Kring, 1998). Accurate interpretation of one's own and of others' emotions is therefore vital to effective interpersonal functioning (Flores, 2004).

In addition to organising responses to the external and interpersonal environment, emotions may affect the intrapersonal world. Memories, imagery, expectations, and self-perception are influenced by emotion (Ekman, 1999). Different aspects of experience may be remembered depending on the current felt emotion (mood congruence), and memories of events with a similar emotion content are more likely to be remembered when experiencing that emotion (e.g. despair at past failures when depressed) (Fiedler, Muehlfriedel, & Unkelbach, 2001). Deficits in the ability to attend to, accept and modulate emotion experienced intrapersonally, tends to result in a less coherent internal experience, less adaptive functioning, more counterproductive emotional expression, and more psychopathology (Greenberg & Johnson, 1988).

Regulating emotions therefore promotes more adaptive functioning in both interpersonal and intrapersonal domains. Regulated emotions allow information about the environment to organise appropriate behavioural responses and enhance the likelihood that the expression of needs through emotion will be achieved in a non- idiosyncratic or disordered fashion (Clarke & Watson, 1994; Levine, Marziali & Hood, 1997). Regulation of emotion therefore appears to be an important aspect to general functioning.

Emotion Regulation – an Overview.

Emotion regulation is considered a multidimensional construct with emotion dysregulation potentially underlying all psychological symptoms and maladaptive behaviours (Bradley, 2003; Gratz & Roemer, 2004). Emotion regulation difficulties have been implicated in over half the DSM-IV Axis I diagnoses and all the Axis II disorders (Gross, 1998). Increasing attention has been paid to the role of emotion dysregulation in a range of clinical disorders including bulimia nervosa (Cassin & von Ranson, 2005; Claes,

Vandereycken, & Vertommen, 2005), substance abuse disorders (Hayes, Wilson, Strosahl, Gifford, & Follett, 1996), complex post-traumatic stress disorder (Cloitre, 1998), and borderline personality disorder (Linehan, 1993). There has also been an increased interest in interventions that hold the potential to address emotion regulation deficits (Gratz et al., 2006; Lynch, Morse, Mendelson, & Roberts, 2003; Telch, Agras, & Linehan, 2001).

Emotion regulation in adults has been difficult to define, despite the apparent intuitive understanding shared by many researchers and clinicians (Thompson, 1994). In order to address this, the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was developed based on an integrative conceptualisation of emotion regulation. It was designed to assess clinically relevant difficulties associated with emotion dysregulation that was more comprehensive than existing measures. The dimensions of emotion dysregulation included in the measure are: (a) awareness and understanding of emotions; (b) acceptance of emotions; (c) the ability to engage in goal directed behaviour, and refrain from impulsive behaviour when experiencing negative emotions; and (d) access to emotion regulation strategies that are flexible, effective, and adaptive (Gratz & Roemer, 2004). In the following review of definitions of emotion regulation, it can be seen that these dimensions are consistently described in other theories.

While emotion regulation in adults does not have a unifying theory, in infancy and childhood emotion regulation has been more clearly explained through developmental and attachment theories (Bowlby, 1962/1969, 1973, 1980; Lewis & Stieben, 2004). These theories are not often applied to emotion dysregulation in the adult

literature. However, as will later be seen, they can provide a platform from which to explore emotion dysregulation in adults and associated behaviours (e.g. impulsivity).

How emotion regulation is defined. The term ‘emotion regulation’ has been used interchangeably with affect regulation, self-regulation, mood regulation, emotional control, emotional coping, and concepts such as experiential avoidance (Campos, Campos, & Caplovitz-Barrett, 1989; Gross, 1998; Hayes, Wilson, Strosahl, Gifford, & Follett, 1996; Rottenberg & Gross, 2003). It has been described as a process that occurs between individuals (via soothing proximity and responsiveness of others), within the individual (consciously or unconsciously), and as a modifiable strategy that can be employed at various points of the emotion generative process (Gross, 1998, 1999, 2002; Wallin, 2007).

The ability to regulate emotions involves acceptance of, insight into, and modulation of, emotional experience (Gratz & Roemer, 2004; Hayes, Strosahl, & Wilson, 1999; Linehan, 1993). Individuals can influence which emotions they will have, when and how they experience and express them, and with which level of intensity (Flett, Blankstein, & Obertynski, 1996; Gross, 1998; Rottenberg & Gross, 2003). Influencing emotion in this way requires having access to emotion regulation strategies. These strategies may be adaptive or maladaptive and can influence social interaction, emotion intensity, psychological health and psychopathology (Flett, Blankstein, & Obertynski, 1996; Rottenberg & Gross, 2003). When emotion regulation strategies are used in a relatively stable or rigid way, it has been suggested that they actually become an aspect of personality and therefore influence the individuals functioning in multiple life domains (Diamond & Aspinwall, 2003; Gratz & Roemer, 2004; Kim, Deci, & Zuckerman, 2002).

Strategies are generally employed as a means of achieving an emotion regulation goal. Emotion regulation goals generally tend to be focused around the maximisation of positive, or minimisation of negative affect (Diamond & Aspinwall, 2003; Levenson, 1994). Other emotion regulation goals may centre on the need to maintain social relationships (e.g. refrain from rageful displays in friendships), to maintain general functioning while distressed (maintain the ability to work after a relationship break-up), or to act in accordance with desired goals (e.g. manage emotional eating when the goal is weight loss) (Gratz & Roemer, 2004). This brief review of some of the definitions of emotion regulation gives some indication of the multifaceted nature of emotion regulation and the ensuing difficulty there has previously been in defining it.

Emotion regulation in clinical and non-clinical populations. Difficulties in defining emotion regulation may also be due to the differences in how emotion regulation is understood in clinical and non-clinical populations. Binge-eating and purging or resorting to deliberate self-harm (DSH) as a means of relieving negative affect have been considered maladaptive but immediately effective attempts at emotion regulation in clinical populations (Blume, 1990; Gratz, 2006). Emotion regulation strategies in a non-clinical population may be far more subtle and less easily detectable. For example, it has been suggested that emotion regulation can occur as a largely unconscious process that is happening continuously (Rottenberg & Gross, 2003). Emotion regulation may occur smoothly and effectively in a non-clinical population, but this process may remain unconscious.

Clinical populations are more likely to experience negative affect more often and with greater intensity, which makes regulation of these emotions more difficult and

recovery time longer (Schulman, Augustine, & Hemenover, 2006). Additionally, confusion over the meaning of emotional experience tends to be more severe for those with intense emotions (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). These individuals may try to focus more on regulating emotions associated with fear, anxiety, anger, and distress, as they tend to impede social functioning (Diamond & Aspinwall, 2003). Focusing on these emotions and their impact may in turn increase the experience of negative emotion, thereby making them harder to regulate and increasing psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Diamond & Aspinwall, 2003; Eftekhari, Zoellner, & Vigil, 2009; John & Gross, 2003).

Negative emotion is likely to be experienced by all individuals (not only clinical populations) at some stage. Negative affect can provide high informational value in signalling the need to change or adjust their current state or activity (Feldman-Barrett, Gross, Conner-Christensen, & Benvenuto, 2001). The means by which these states are adjusted depends on the emotion regulation strategies available to the individual. Individuals with greater differentiation between negative emotions tend to regulate them using a wider range of emotion regulation strategies than those with less clarity, attention, and differentiation (Feldman-Barrett et al., 2001).

Facets of emotion regulation.

Attention, clarity and differentiation. Certain clinical populations (e.g. individuals with bulimia and alexithymia) tend to have less attention to emotions, as well as less clarity and differentiation between emotions (Bradley, 2003; Hayes & Feldman, 2004; Taylor, Bagby, & Parker, 1997). An individual with emotional clarity would be able to describe, identify, and understand emotions (Salovey, Mayer, Goldman, Turvy, &

Palfai, 1995). An individual low in clarity is more likely to have trouble with neuroticism and be more vulnerable to distress. Those low in clarity may find reactions in emotional situations unpredictable and problematic. An individual who pays attention to, and has clarity about emotions is likely to take notice of and value emotions. However, if there is too little attention, the individual is unlikely to function well, and if there is too much they may see emotions as relevant to everything. Having low emotional clarity, or too much or too little emotional attention, may lead to difficulties with emotion regulation, disturbances in interpersonal relationships, and may have implications for the individual's general functioning (Gohm, 2003; Salovey et al., 1995).

Differentiation of emotion (the ability to identify and describe emotions) is considered an important dimension of emotion regulation (Cole, Michel, & Teti, 1994). Individuals with bulimia have been found to have difficulties with emotion regulation and with identifying and labelling emotions. A limited ability to identify and describe emotions has been associated with the tendency to discharge tension arising from unpleasant emotions via impulsive behaviours (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). The ability to verbally conceptualise emotion experience facilitates the self-reflective process and enhances self-regulation (Cole, Michel, & Teti, 1994). Difficulty describing and identifying one's emotions has been associated with depression, neuroticism and general distress (Salovey et al., 1995). Deficits in emotion differentiation may cause the individual to experience emotions intensely but have limited resources to repair them due to a restricted ability to identify the cause or to place them in context (Eftekhari, Zoellner, & Vigil, 2009; Taylor, Bagby & Parker, 1997).

Some individuals are able to label emotion accurately and form coherent emotion regulation strategies. Some may have access to a wide emotion vocabulary but have low emotional granularity. Individuals low in emotional granularity tend to represent their experiences largely in terms of pleasure or displeasure rather than as a complex experience with high informational value. They may use different emotion words to describe the same emotion but do not capture the multifaceted nature of what they are feeling or of the events contributing to the emotions (Barrett, Mesquita, Ochsner, & Gross, 2007). Effective emotion regulation involves being able to identify not only the physical sensation, but also the event that prompted the emotion, and the interpretation of the event (Linehan, 1993). Attention to these aspects would likely improve the functional effectiveness of the individual by allowing them to differentiate between a repertoire of possible causes for the emotional state, to reduce their uncertainty about responses and provide information on what actions to take next so they can act in accordance with desired goals (Barrett et al., 2007).

Regulating emotion to act in accordance with desired goals. Emotionally dysregulated populations tend to have difficulties in choosing appropriate behaviours while emotionally distressed and are often unable to act in accordance with desired goals (Gratz & Roemer, 2004). For example, an individual with bulimia may binge eat despite the goal of weight maintenance. An individual with borderline personality disorder may not regulate their anger at another person despite the goal of avoiding abandonment and maintaining relationships. These inappropriate behaviours may also be impulsive in nature (Fischer, Smith, Spillane, & Cyders, 2005; Linehan, 1993). For example, when

experiencing negative mood, the individual may engage in rash maladaptive actions such as gambling, substance use, or bingeing and purging.

Emotion regulation strategies. What may contribute to the ability to act in accordance with desired goals, are the emotion regulation strategies that are employed throughout the emotion regulation process. A large body of literature focuses on modulation of emotional arousal and regulation strategies. Specific emotion regulation strategies have been identified: situation selection (approaching or avoiding certain people or places), situation modification (tailoring the situation in order to modify its emotional impact), attentional deployment (rumination and distraction, or concentration or absorption in tasks being undertaken), cognitive change (reframing, reappraisal, intellectualisation, or denial), and response modulation (directly influencing physiological, experiential, or behavioural responding). Maladaptive strategies (rumination, avoidance, denial) have been more strongly associated with psychopathology than adaptive strategies (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Response modulation may occur through self-soothing, relaxation, disordered eating, or drug use to reduce physiological and experiential aspects, or through inhibiting the expressive behaviour of emotion which may decrease the experience of the emotion (Gross, 1998).

Emotion regulation strategies can be employed at different time points of the emotion experience. Antecedent-focused strategies are employed prior to the elicitation of the emotion and may include the avoidance of emotion eliciting situations, the deployment of attention to less emotionally arousing aspects of situations, and cognitively reappraising a situation or ability to cope with it. Response-focused strategies

involve modulating responses once the emotion is already activated (Gross, 1998, 1999; Gross & John, 2003). Emotion regulation strategies are generally considered either adaptive or maladaptive.

Maladaptive strategies. Maladaptive strategies can range from avoidance or suppression of emotional experience, to attempts to over-control emotional experience (Chambers, Gullone, & Allen, 2009; Diamond & Aspinwall, 2003; Barrett, Gross, Conner-Christensen, & Benvenuto, 2001; Hayes, Wilson, Strosahl, Gifford, & Follett, 1996). Avoidance and suppression strategies may appear effective in the short term, but are often harmful in the long-term as difficult emotions can be experientially important and lead to healthy behavioural changes (Hayes & Shenk, 2004). ‘Experiential avoidance’ occurs when a person is unwilling to stay in contact with private experiences and takes steps to alter these experiences or the contexts that occasion them. Although the immediate effects of experiential avoidance are apparently positive, they have long-term consequences (Hayes & Shenk, 2004). Rumination for example, may be utilised in an attempt to reduce further arousal or distress but does not allow the person to effectively address the eliciting situation (Borkovec & Roemer, 1995). Rumination and repression are considered avoidance strategies but tend to have the paradoxical effect of prolonging uncomfortable emotion (Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Weinberger, Schwartz, & Davidson, 1979). Suppression, inhibition or over-control of emotion may give the impression of reducing emotional suffering but they have been found to decrease self-reported experience of some emotions (pain, pride, amusement), but not others such as sadness (Gross & Levenson, 1997). There is also evidence to suggest that attempts at emotional suppression may result in the perception of reduced arousal but paradoxically

results in more physiological arousal and distress, and may increase sympathetic nervous system activation (Gross, 1998a; Gross & John, 2003). Over-control can prevent people from learning how to read their feelings of distress as valuable information about themselves and their environment (Diamond & Aspinwall, 2003). For example, over-control may involve avoiding all expressions of, as well as the private experience of, anger even in the face of personal threat, thereby missing vital emotional information that could inform action. Additionally, attempts to control emotion have been associated with higher levels of physical arousal and may actually contribute to increased difficulties in emotion regulation (Flett, Blankstein, & Obertynski, 1995; Gross & Levenson, 1997; Muraven, Tice, & Baumeister, 1998).

Adaptive strategies. Adaptive strategies may include deliberate activation of positive emotion in the face of negative arousal. Positive emotions can undo the negative psychological and physiological effects of negative emotion. Co-activation of both positive and negative emotions may also prevent acute episodes of negative affect becoming solidified into defensive and maladaptive regulatory patterns (Diamond & Aspinwall, 2003). Cognitive reappraisal and the use of other cognitive strategies to decrease negative emotion has been suggested as an emotion regulation strategy, but its effectiveness has received modest empirical support (Gross, 1999). However, distraction as a form of avoidance has been found to be beneficial (Aldao, Nolen-Hoeksema, & Schweizer, 2010). It was found that following a distraction exercise after both a sadness and anger inducing task, participants reported feeling less sad, happier and more agreeable, more interested, less fearful, angry and disgusted (Duclos and Laird, 2001).

Relaxation strategies tend to be beneficial for assisting in the regulation of emotions. Meditation generally has been associated with improvements in coping and health, and with subjective quality of life (Grossman, Niemann, Schmidt, & Walach, 2004; Shapiro, Schwartz, & Bonner, 1998). Specific types of meditation (e.g. mindfulness) have been found to increase left hemispheric activation which has been associated with greater positive affect, thereby regulating the experience of negative affect. Left hemisphere activation has also been associated with more adaptive responding to negative and/or stressful events, suggesting that this may allow for more flexible and effective emotion regulation strategies (Davidson et al., 2003). In addition, the attitudes employed in practicing mindfulness (e.g. non-reactivity to felt experience; non-judgement of experience) tend to encourage more adaptive emotion regulation (Kabat-Zinn, 1996). However, acceptance in general, which is a part of mindfulness was found to have small effect sizes when used as an emotion regulation strategy in a clinical population (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

Similar to aspects of mindfulness and acceptance, is the regulation strategy of savouring as a means of creating and sustaining positive emotional experiences. Savouring can occur prior to the event (anticipatory phase), can be utilised to be fully present during the event (engagement phase), and can be used after the event (reminiscing phase) with the remembering of positive thoughts, images and sensations to infuse the present with more pleasure. Savouring is a means of upregulating or enhancing positive emotion (Bryant, 2003).

Upregulating positive emotions as a means of emotion regulation has long term benefits for psychological functioning. Benefits have been suggested as accruing from

cultivating positive emotions in daily life as well as in response to negative circumstances and may provide a buffer against stress (Fredrickson, Manusco, Branigan, & Tugade, 2000). Positive emotions may be cultivated through adopting strategies such as searching for benefits and meaning in life (even after trauma), engaging in spiritual thoughts and behaviours, using humour, and actively adopting an attitude of gratitude (Kashdan, 2006). In support of the benefits of upregulating positive emotions, after experimentally inducing positive emotions, it was found that the autonomic arousal generated by negative emotion was reduced thereby providing an effective and adaptive emotion regulation strategy (Fredrickson et al., 2000).

For some individuals these adaptive strategies may occur effortlessly, automatically, and unconsciously (Rottenberg & Gross, 2003). Others may have deficits in the ability to employ these strategies that derive from early environments, differences in neurobiology and personality traits.

Emotion dysregulation, neurobiology and early environments. There is evidence emerging in the neurobiological literature that early environments affect brain development at critical periods and can result in deficits in emotion regulation abilities. This is believed to contribute to relatively stable ways of responding and fairly stable personality characteristics. People continue to use the same emotion regulation strategies if they provide even temporary relief from emotional arousal and these can become habitual and integrally linked to their personality style. Individuals who have difficulties with emotion regulation may respond with inflexible and maladaptive regulative strategies, continuing to use them despite implications for adjustment (Cole, Michel, & Teti, 1994; Levine, Marziali, & Hood, 1997).

Temperament and differences in response to arousal may also play a role in the development of emotion regulation. A mismatch in temperament between infant and caregiver may contribute to dysregulation (Field, 1994). Infants who experience extreme distress in response to events may become too disrupted to permit acquisition of internal mechanisms for regulating distress. Frequent displays of distress by the infant may affect the dyadic interaction via the caregivers' inability to respond reliably at all times given the frequency of the distress (Calkins, 1994). Additionally infants may differ on such things as their degree of reactivity to frustration. Low frustration tolerance may require fewer restrictions by the caregiver for optimal development. If the caregiver provides a restrictive environment, the child is likely to develop anger and hostility at being thwarted in attempts to explore and investigate their environment. Reactivity to novelty can produce anxiety and apprehension if not sensitively responded to. Continued temperamental needs and misattuned caregiving interact to contribute to emotion dysregulation as a function of personality (Calkins, 1994). Some of these early relationships may prevent the development of the ability to self-soothe, or may signal to the infant that some emotions are not acceptable and should not be experienced (Cassidy, 1994). These invalidating environments can contribute to later psychopathology and disturbances in personality development (Linehan, 1993).

Personality dimensions have been used to describe individual differences in emotion processing and regulation. It has been found that extraverted and emotionally stable individuals tend to exhibit slow rates of positive and rapid rates of negative emotion decay. Individuals who are introverted and high in neuroticism tend to show slow rates of negative and rapid rates of positive affect decay – in other words,

introverted and high-neuroticism individuals have a negative affect repair deficit.

Individuals high in neuroticism have been described as having an enduring tendency to experience negative emotional states, including anxiety, anger, guilt, and depression more frequently and more intensely than low-neuroticism individuals (Matthews & Deary, 1998; Schulman, Augustine & Hemenover, 2006). They are reported to have heightened sensitivity to environmental stress, perceiving ordinary situations as threatening, and minor frustrations as especially difficult. They tend to have difficulties regulating emotions in order to control urges and delay gratification (Goleman, 1997). They tend to spend more time focusing on their feelings, but fail to understand them through having low affect clarity. This in turn reduces emotion regulation success as it impacts the ability to consider a variety of strategy choices. Additionally, through experiencing events and emotions more negatively more frequently, high-neuroticism individuals are more likely to have stronger and denser negative neural pathways. So when negative affect is experienced, a wider set of memory nodes is activated, resulting in a net stronger spreading activation that is harder to extinguish, recover from, and repair. Therefore, experience of negative emotion and emotion dysregulation is perpetuated (Schulman, Augustine & Hemenover, 2006).

Invalidating, traumatic, or abusive environments are believed to lead to deficits in the function of the prefrontal system and excessive arousal of the HPA (hypothalamo-pituitary-adrenocortex) axis. The consequences are suggested as being deficits in emotion coding, the reduced capacity of the sympathetic and parasympathetic nervous systems to operate reciprocally, rendering the individual vulnerable to disorganisation and to having discontinuous and labile affects in the face of even moderate stress, and to engage in

impulsive behaviours (difficulty learning from previous mistakes; predisposition to addiction disorders; aggression) (Schoore, 2003). These difficulties severely limit the capacity for the individual to regulate their emotions. Individuals from less traumatic early environments may experience similar deficits in emotion regulation but to a lesser extent. These deficits however, are not impervious to change (Diamond & Aspinwall, 2003).

Recently there has been a convergence of neurobiological research and attachment theory as a means of explaining both emotion regulation and dysregulation in childhood and more recently adulthood. Difficulties with early attachment experiences and emotion dysregulation have also been explored as a basis for the development of adult psychopathology.

Emotion Dysregulation and Attachment Theory.

Developmental tasks. Until recently much of the research on emotion regulation has been derived from developmental literature discussing the period from infancy to childhood (John & Gross, 2004). Functional emotion regulation involves learning frustration tolerance, coping with fear and anxiety, learning to defend the self, and tolerating being alone (Cole, Michel, & Teti, 1994). Children are believed to have an innate difference in their ability to develop emotion regulation strategies and to tolerate both positive and negative emotions (Gross, 1998). Children may bring temperamental differences to each caregiver or peer relationship but it is the dynamic processes occurring that alter the trajectory of emotion regulation and related capacities (Calkins, 1994; Diamond & Aspinwall, 2003). The environment in which a child is raised is largely thought to be the most substantial contributing factor to the development of emotion

regulation (Cassidy, 1994). Sensitive, flexible, reliable emotional responses from the caregiver to the child are thought to produce an affectively balanced personality, where the child develops a sense of efficacy in managing and modulating her own feeling states (Cassidy, 1994). Invalidating, emotionally abusive, or maltreating environments can lead to a distorted emotional life and emotion dysregulation, which then tends to generate an individual who displays dysfunctional and inappropriate responses to emotional communication, including emotional inhibition, excessive expression, or an inability to modulate emotional experiences (O'Hagan, 1995).

Embedded in the developmental literature and with a biological basis that has been receiving recent attention, attachment theory has become one of the most important conceptual frameworks for understanding the process of affect regulation (Mikulincer, Shaver, & Pereg, 2003). Attachment theory posits that the affective bond that develops between the infant and caregiver has consequences for the child's ability to regulate emotion (Cassidy, 1994). Bowlby (1969, 1973, 1980) argued that infants are born with a repertoire of attachment behaviours that are considered an innate emotion regulation device (e.g. clinging, crying, smiling, and developing preferences for a few reliable attachment figures) which have the aim of seeking and maintaining close proximity to supportive others. These attachment behaviours are considered part of an evolution-based functional biological system that is designed to protect the individual from both physical and psychological threats, and to alleviate distress (Levy, 2005; Mikulincer, Shaver, & Pereg, 2003). Maintaining proximity to the primary attachment figure allows the immature infant to utilise the caregiver's mature functions to assist in organising experience, as well as assisting in the containment and modulation of aversive emotional

experiences (Levy, 2005). Interactions where the caregiver is attuned to the infant's needs assist the infant in regulating positive and negative states, essentially scaffolding the infant's coping capacities and ability to regulate emotion (Schorer, 2003).

Through these repeated transactions with the caregiver, infants form mental representations or affective-cognitive schemata of the self and others and develop expectations of interpersonal relations which are labelled *internal working models* (Bowlby, 1973). Internal working models are believed to organise personality development, regulate affect and subsequently shape future relationships (Schorer, 2003). Much of the development of internal working models and attachment organisations occur while the individual is still immature, leaving many opportunities for development on either an adaptive or maladaptive course via the responsiveness of the caregiver (Bowlby, 1969). For example, a child whose caregiver has responded in a consistent, loving, and supportive manner is likely to develop the sense that the world is a safe place, that they can rely on protective others, and can confidently explore the environment and engage effectively with other people. There is the expectation that attachment figures provide a safe physical and emotional haven. Positive interactions therefore facilitate optimal functioning of the attachment system creating *secure* attachments and the result is not only positive expectations about others availability but also positive views of the self as competent and valued (Sroufe, Carlson, Levy, & Egeland, 1999). Secure attachments are believed to facilitate optimal right brain and prefrontal cortex development, and limbic control in infancy. Excessive and non-optimal right hemisphere activation is related to emotional reactivity and vulnerability to psychopathology, the impaired ability to terminate negative emotion once it has begun, the tendency to experience negative affect

more frequently, depression and lower self-esteem, and chronic difficulties with emotion regulation (Schoe, 2003). Individual differences in regulation ability may stem from automatic features of the affect system – associative networks and neural metabolism. Strong left hemispheric activation in the prefrontal cortex predicts rapid recovery following exposure to a negative stimulus and slow amygdala glucose metabolism, which is associated with low trait negative affect (Larson, Sutton, & Davidson, 1998).

The development of a secure attachment results in strategies that are constructive, flexible and reality attuned. Securely attached individuals are able to acknowledge and display distress, seek support and restore emotional equanimity without the activation of other maladaptive means of coping such as withdrawal, avoidance, or rumination (Mikulincer, Shaver, & Pereg, 2003).

When attachment figures are perceived as being unavailable or are unresponsive to needs, negative representations of the self may develop and result in views of the self as unworthy, unlovable, and unacceptable and others as unreliable, uncaring, untrustworthy, and inaccessible (Levy, 2005; Pietromonaco & Feldman-Barrett, 2000). This results in insecure attachment where distress experienced by the child is compounded by the unavailability of the primary attachment figure (Mikulincer, Shaver & Pereg, 2003). A further implication is that the child may then develop *secondary attachment strategies* which can include either *hyperactivating* strategies or *deactivating* strategies. Hyperactivating strategies include intense approach and proximity seeking tendencies, with the attempt to elicit the involvement, care and support of the attachment figure through clinging and controlling responses. Where proximity seeking may not be a viable option, deactivating strategies are instead employed. The primary goal in this

instance is to keep the attachment deactivated to avoid the frustration and further distress caused by attachment figure unavailability (Mikulincer, Shaver, & Pereg, 2003).

Deactivating strategies. Deactivating strategies or *avoidant* styles are constructed where, for self protective purposes, the child may restrict its overt expressions of an attachment need for dyadic regulation. The primary goal in this instance is to keep the attachment deactivated to avoid the frustration and further distress caused by attachment figure unavailability (Mikulincer, Shaver, & Pereg, 2003). The child may learn to disengage from the external world through avoidance, withdrawal and restricted affect (Cassidy, 1994). This limits the child's opportunity for emotion processing as they shift from interactive regulation to less complex autoregulatory modes which may result in dissociative tendencies. Emotion regulation is achieved by directing attention away from internal emotional states, however, this impairs the ability to adjust, to take action on their own behalf, and blocks the capacity to register affect. Habitual avoidance of emotions generally leads to the avoidance of novel emotional contexts where the individual would usually get to process more complex affective information. Additionally, they miss the opportunity for interactive regulation and emotional learning (Schoore, 2003).

Hyperactivating strategies. Hyperactivating strategies or *anxious/ambivalent* styles include utilising intense approach and proximity seeking tendencies, with the attempt to elicit the involvement, care and support of the attachment figure through clinging and controlling responses. Frequent rejection and inconsistent parenting may result in the infant heightening the importance of the relationship and responding with exaggerated negative emotionality in an attempt to attract the attention and maintain the

proximity of the caregiver. This can result in chronic dysregulation in adulthood as negative emotionality becomes pervasive and can interfere throughout development with tasks such as exploration. Additionally, attention may be chronically attuned to the ‘frightening’ or threatening aspects of the environment (Mikulincer, Shaver, & Pereg, 2003). These insecure/ambivalent types tend to show greater negative reactivity than they actually feel (Cassidy, 1994).

With these types of dyadic attachment relationships, there is no provision for interactive repair for intense negative or positive affect, leaving the child in heightened emotional states for long periods of time. Unresponsive and misattuned caregivers also fail to respond to positive affect as well as distress. They then fail to catch and build on positive affective experiences making it less likely that they will learn to enhance positive emotion. No mirroring of affects and celebratory approval are internalised so the child can not actively and independently deploy positive emotion in the service of regulation (Diamond & Aspinwall, 2004). Dysregulation therefore remains pervasive. When the child is emotionally dysregulated for long periods of time, all regulatory resources are devoted to managing the arousal. If dysregulation is experienced too frequently, opportunities for socio-emotional learning may be forfeited and may develop into impaired capacities for interpersonal relationships, and relatively stable styles of insecure attachment styles and behaviours (Schoore, 2003).

Emotion dysregulation and the developing brain. There is mounting research to suggest that attachment relationships influence brain development. Secure attachments increase blood flow to the pre-frontal cortex of a child’s brain resulting in growth in neural tissue in the emotional and attention centres. MRI’s have found a decrease in the

size of brains of children who have been neglected or have depressed caregivers (poor attachments) which can lead to deficits in emotion regulation and the ability to inhibit impulsive urges and addictive behaviours. During critical times if children have been provided with a poor attachment experience, their brains show less opiate receptor density, leaving them with more difficulties in regulating affect and self-soothing (Flores, 2004).

Dysregulated states in infancy are accompanied by severe alterations in brain chemistry, especially in relation to the development of coping capacity and emotion regulation. This can lead to more than an insecure attachment. A chaotic alteration of the emotion processing limbic system and the structure of the right brain are triggered, predisposing the individual to experience even low levels of stress as traumatic and to have deficits in the ability to regulate emotion intensity. They may also develop enduring deficits later in life where novel emotional experiences cannot be easily assimilated and are experienced as very stressful (Schorer, 2003). Deficits are carried into different contexts in which they are inappropriate and maladaptive, for example with new social partners where there is no attachment history (Cassidy, 1994). In addition, insensitive caregiving and insecure attachment relationships affect the developing limbic system which regulates emotion and can produce permanent functional impairments in the ability to direct emotions into functional channels. This can lead to characterological styles of coping that are driven by anxiety, feelings of hopelessness and depression, vulnerability to psychiatric disorders, and insecure attachment styles in adulthood (Schorer, 2003).

Considering the impact early environments have on the developing brain, the ability to regulate emotions, and on the development of internal working models that

represent attachment security or insecurity, it is not surprising that attachment styles, attachment behaviours, and emotion regulation strategies tend to persist into adulthood.

Adult attachment, emotion regulation and dysregulation, impulsivity, and secondary attachment behaviours. Initially, attachment styles were reserved for describing relationships during infancy but there is considerable evidence to suggest that these same styles can be applied to adult attachment patterns. The percentage of individuals reporting the same category of attachment style from infancy over a 16 to 21 year period has ranged from 39% to 64% (Scharfe, 2003). Others report a level of consistency of over 80% from infancy to 19 years (Main, Hesse, & Kaplan, 2005).

Although there is considerable consistency, attachment styles are considered flexible and amenable to change through varied experiences in interpersonal relationships (Dozer & Tyrrell, 1998). Internal working models are considered rules by which information relevant to attachment is processed. These ‘rules’ direct feelings, behaviour, attention, memory, and cognition which influence the way the individual relates (Main, Kaplan, & Cassidy, 1985). A partner that consistently responds in ways that disconfirm these rules, may allow the insecure individual to integrate attachment feelings, cognitions, and behaviours that were not able to be accommodated in their early relationships. These individuals may then transition from an insecure to a secure style and have been labelled ‘earned secure’ (Crowell, Treboux, & Waters, 2002).

Adult attachment styles have been linked not only with reliable ways of responding in relationships but in the employment of different methods of regulating emotion (Pietromonaco, Feldman-Barrett, & Powers, 2006). A basic understanding of the

various delineated types is necessary to understand how emotion regulation may manifest.

Four category models have been developed based on Bowlby's model of internal working models. One model has been based on differences in terms of views of self and others. This was derived by combining two levels of self-image (positive vs negative) with two levels of image of others (positive vs negative) (Bartholomew & Horowitz, 1991). Other models and conceptualisations reflect the way attachment behaviours are displayed in both adult and infant behaviour (Ainsworth, Blehar, Waters, & Wall, 1978; Main, Kaplan, & Cassidy, 1985). The *secure* prototype (positive views of self and others) was summarised as being characterised by valuing intimate relationships, having the capacity to maintain close relationships without relinquishing autonomy, coherence in discussing relationship issues, and being unconcerned about possible rejection. The *dismissive-avoidant* style (positive model of self, negative model of others) devalues the importance of close relationships, has restricted emotionality, emphasises self-reliance and independence, and has a lack of clarity in discussing relationships. The *preoccupied* type (negative model of self, positive model of others) typically demonstrates over-involvement in relationships, dependence on others approval and acceptance for a sense of wellbeing, a tendency to idealise others, and incoherence or excessive emotionality when discussing relationships. The *fearful-avoidant* type (negative views of self and others) tends to avoid close relationships due to a fear of rejection, personal insecurity, and a distrust of others (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987; Levy, 2005; Pietromonaco & Feldman-Barrett, 2000).

An additional *disorganised/unresolved* type has been suggested that tends to incorporate all elements of the other attachment styles but with inconsistency and incoherence (Main & Solomon, 1990). This attachment style tends to have a fragmented and incoherent model of attachment that cannot be easily integrated. They desire closeness but fear it equally resulting in an approach-avoidance dilemma. The disorganised/unresolved type are more highly represented in populations with abusive histories (Main & Solomon, 1990; Wallin, 2007).

More recently, it has been suggested that adult attachment can be reduced to two dimensions, 'avoidance' (discomfort with closeness and dependency) and 'anxiety' (about abandonment) (Brennan, Clark, & Shaver, 1998). The two dimensions can be clustered into four groups that are conceptually similar to Bartholomew & Horowitz (1991) categories. The *secure* cluster is described as low on anxiety and avoidance; the *fearful* cluster as high on avoidance and anxiety; the *preoccupied* cluster as low on avoidance, high on anxiety; and the *dismissing* cluster as high on avoidance and low on anxiety.

Based on these clusters, securely attached adults have been described as experiencing more positive emotions on a day to day basis (Alford, Lyddon, & Schreiber, 2006; Diamond & Aspinwall). They tend to acknowledge emotional arousal, engage in instrumental actions, ask for others' support, and aim for successful management of the situation. Securely attached individuals have been found to react to negative affect with weaker physiological arousal than insecure individuals, and to direct more attention to positive than negative aspects of a situation. They tend to acknowledge negative emotions without being overwhelmed by them and show high accessibility and processing of them

(Mikulincer & Sheffi, 2000). Having a secure base leads individuals to open their schemas to threatening information, revise erroneous beliefs, and to explore strong and weak self-aspects. They tend to develop more flexible and well-adjusted views of the self and more reality attuned coping plans (Mikulincer, Orbach, Iavnieli, 1998).

With insecure styles, negative representations of self and/or others prevent the individual from using effective proximity seeking as an emotion regulation strategy, relying instead on the secondary strategies of hyperactivating or deactivating attachment needs (Mikulincer, Shaver, & Pereg, 2003). Emotion regulation strategies for anxious-ambivalent types who are low in avoidance will be to seek others for support, often in an exaggerated way (Pietromonaco, Feldman-Barrett, & Powers, 2006). This type tends to perceive threat frequently in the physical and social world and to exaggerate the potential negative consequences of those threats. They report intense emotions, frequent ups and downs, high anxiety and impulsiveness (Pietromonaco & Feldman-Barrett, 2000). They tend to intensify negative emotional responses to threatening events and ruminate about threat related concerns, allowing distress to spread to other areas of life. They tend to have an angry preoccupation with relationships and conflictual feelings towards relationships (Mikulincer, Orbach, & Iavnieli, 1998). They remain hypervigilant to possible signs of rejection, disapproval, or impending abandonment. This produces a self-amplifying cycle of distress in which chronic attachment system activation interferes with engagement in other activities (Mikulincer, Shaver, & Pereg, 2003; Mikulincer & Sheffi, 2000). They engage in hyperactivating strategies which involve excitatory pathways that serve to increase the monitoring of threats to the self and of attachment figure unavailability (Pietromonaco & Feldman-Barrett, 2000). Effective emotion regulation

strategies may not be exercised leaving them unable to act in accordance with desired goals when emotionally aroused. Additionally, people who score high on anxiety dimensions tend to have negative views of themselves, are pessimistic, have ready access to painful memories and exhibit an automatic spread of negative emotion from one remembered incident to another, and over-attend to distress cues (Mikulincer & Orbach, 1995; Mikulincer & Sheffi, 2000). This is likely to result in continued arousal and maintenance of negative emotional states, making regulation of these emotions more difficult.

Individuals high in the avoidance dimension tend to deactivate attachment behaviours and instead turn to secondary strategies. These dismissing-avoidant types tend to use defensive emotion regulation strategies or suppression as secondary attachment strategies rather than relying on others (Pietromonaco, Feldman-Barrett, & Powers, 2006). They tend to employ deactivating strategies that can involve literal and symbolic distancing from distress whether it is attachment related or not. This leads to the denial of attachment needs, avoidance of closeness and intimacy, and compulsive striving for self-reliance and independence. Avoidant-type emotion regulation strategies involve active inattention to threat and personal vulnerabilities as well as the inhibition and suppression of thoughts and memories that evoke distress and feelings of vulnerability. These individuals tend to project negative self-traits onto others, fail to acknowledge negative emotions and deny basic fears (Mikulincer, Shaver, & Pereg, 2003). They tend to distance themselves from emotion-laden material, have low accessibility of negative emotions, have a lack of interoceptive awareness, and restricted control of emotional expression (Mikulincer & Sheffi, 2000). There is conflicting research in regards to

whether the avoidance strategies are effective with some stating that there is greater physiological arousal even if there is no outward manifestation of distress, while others state that the avoidant type has become so adept at masking distress that they are unaffected (Johnson, 2004; Mikulincer & Sheffi, 2000; Pietromonaco & Barrett, 2000).

Secondary attachment behaviours. When there is belief in the chronic unavailability of attachment figures, individuals may choose to engage in a form of secondary attachment behaviour when the attachment system is activated. This will often involve turning to substance use, binge eating, and other impulsive behaviours to replace needs for interpersonal emotion regulation (Flores, 2001). As previously stated, this may be largely the result of permanent neurobiological alterations or deficits in early infancy, deriving specifically from the quality of the attachment relationship (Schorre, 2003). It is proposed that individuals are generally driven to seek the comfort and assistance of significant others in order to organise fragmenting emotion into meaningful experience. As an adult, when these relationships are not available and emotion regulation and self-soothing capacities are not internalised, the need for external sources of gratification such as substance use and overeating to meet attachment needs increases. These behaviours, usually impulsive, then serve as a misguided attempt at affect regulation in the absence of a responsive and available attachment figure (Flores, 2001). These behaviours can dampen unwanted cognitive or emotional responses, and suppress bodily arousal in the short-term thereby reinforcing their use. However with rigid and consistent use, they can promote heightened suffering (decreased social contact and interaction, restricted range of activities) and/or heightened physiological/emotional responsiveness. This perpetuates

the belief in the unavailability of others for support and increases the appeal of impulsive behaviours to relieve emotional distress (Zvolensky & Forsyth, 2002).

These different types of secondary strategies are proposed to be specific to particular attachment styles (Mikulincer, Shaver, & Pereg, 2003). There is the suggestion that there are particular behaviours that are engaged secondary to effective emotion regulation strategies and in the absence of available attachment figures (Flores, 2004; Zvolensky & Forsyth, 2002). For example, individuals with an avoidant attachment style may be more likely to have reduced interoceptive awareness (the ability to attend to internal states) due to the desire to deny attachment needs and minimize emotions (Kiang & Harter, 2006). They may engage in eating disordered behaviour (bingeing) in order to avoid a focus on self that is unflattering (Heatherton & Baumeister, 1991; Johnson, Maddeaux & Blouin, 1998). They may be more likely to engage in impulsive behaviours to avoid negative emotion and are more likely to use experiential avoidance as an emotion regulation strategy (Cooper, Flanagan, Talley, & Michaelas, 2002; Kiang & Harter, 2006; Zvolensky & Forsyth, 2002). Anxious styles may also have low interoceptive awareness as they may be too anxious to respond to visceral states such as those related to hunger or thirst (Kiang & Harter, 2006). They may also engage in eating disordered behaviour but have greater focus on body image, as being thin and therefore attractive which may heighten the hope of approval (Johnson, Maddeaux & Blouin, 1998; Orzolek-Kronner, 2002). They may tend to exhibit high levels of anxiety and depression as they tend to overemphasise negative emotionality in order to gain care (Orzolek-Kronner, 2002). This negative emotionality may predispose anxious style individuals to

engage in more impulsive behaviours in order to alleviate negative affect (the urgency facet of impulsivity) (Fischer, Smith, Spillane, & Cyders, 2005).

Some impulsive behaviours may therefore be presumed to be an attempt to regulate attachment related emotions, and as secondary strategies for attachment needs. While most theories of impulsivity and impulsive behaviour focus on impulsivity as a trait, there are others that support the concept that impulsive behaviours may be secondary to emotion dysregulation from poorly attuned early attachment relationships and the subsequent internal disorganisation and incoherence.

Theories in support of impulsivity as a secondary attachment behaviour.

L'Abate. L'Abate (1993) describes impulsivity as a learnt behaviour that develops in the context of parental and caretaking styles that are characterised by immediacy, reactivity, and oppositionality. He suggests that the impulsive child has likely had inconsistent parenting in which it has been necessary to develop inconsistent ways of responding in order to ensure the caregivers attention and care. There may have been physical or verbal abuses, heightened reactivity from caregivers to the child's behaviours and calls for attention, or little opportunity provided for the child to differentiate, creating a context of helplessness, hopelessness and deterioration of communication. Intimacy may have occurred sporadically, requiring flexibility in the infant's ability to self-soothe and to rely on others. Being vulnerable likely had varying consequences, with difficult and painful emotions modelled as being intolerable and to be avoided. The infant likely learnt to quickly move on from experiences, with a strong drive to avoid painful experiences and approach pleasurable ones. Internalisation of any uncomfortable emotion

likely resulted in immediate emotional discharge resulting in acting out with impulsive behaviours (L'Abate, 1993).

L'Abate states that impulsivity is the expression of stunted and distorted personality development accompanied by poor interpersonal skills. The emotional repertoire of the impulsive individual is considered limited. The immediate present is most important, past and future of no consequence. Awareness is limited to immediate pleasure and gratification, and context is denied. The impulsive individual is unable to be emotionally present, available, and intimate with themselves or loved ones. Painful or hurtful affect is avoided and the major feelings allowed and expressed are frustration and anger (L'Abate, 1993).

Consistent with this theory, Barratt (1993) found that highly impulsive individuals tend to have difficulty maintaining good, consistent, sustained interpersonal relationships. They tend to be better at first impressions and in managing brief interactions where their inability for sustained intimacy is not challenged. He found that they tend to have a fast cognitive tempo and will move quickly from experience to experience (Barratt, 1985a).

Marks-Tarlow. Another theory that specifically indicates that impulsivity may be a secondary behaviour to emotion dysregulation was proposed by Marks-Tarlow (1993). He uses chaos theory to describe impulsivity and suggests that in adults, impulsivity may represent the inability to contain the chaos of disruptive emotions, possibly due to a lack of coherently organised self-structure. Mood itself is considered chaotic in nature. Some people may not be able to tolerate the internal chaos caused by the unpredictability and changeability of mood, especially if inconsistent with cognitive structures that define the self. In this case, the chaos of intense mood could itself be disorganising, threatening the

fragmentation of self. Because any intense mood may be disorganising, impulsive behaviours could be triggered by either positive or negative emotions. Any crisis could be a trigger for impulsive behaviour and times of crises may be the time that individuals with impulsive proclivities will most likely express or escalate in this behaviour. Therefore impulsive individuals may attempt to avoid the disorganising effects of chaotic (positive or negative) emotions by bingeing on food, alcohol, or drugs in an effort to dull or eradicate these chaotic mood states temporarily. Impulsive behaviours may be an attempt to avoid internal disruption (emotion dysregulation) by dissipating energy into the environment rather than dealing with it internally (Marks-Tarlow, 1993).

In support of this theory, Self Psychologists believe that emotion dysregulation develops from inadequate self-structure which is cultivated in the context of insecure attachments. These theorists postulate that all addictions, including binge eating and bulimia, are misguided attempts at emotion regulation and self-repair (Flores, 2004). Women who binge eat have reported bingeing in response to crises and are believed to have core deficits in sense of self. They tend to experience either a positive or negative event and become flooded by thoughts and emotions they cannot process due to a lack of internal coherence. There is then an urgent need to relieve the chaotic state through the impulsive act of bingeing and possibly purging (Kullman, 2007).

These perspectives view impulsivity as a behaviour stemming from a non-optimal family environment leading to insecure attachment, emotion dysregulation and/or internal chaos. In support of this, two studies exploring the relationship between attachment style, emotion dysregulation, and impulsivity found similar results. One study compared two competing models of the relationship between adult attachment, negative affect,

impulsivity, and Borderline Personality Disorder (BPD) features in a non-clinical sample. It was found that attachment anxiety, but not avoidance, was significantly related to negative affect and impulsivity, which mediated the relationship to BPD. It was concluded that a dysregulated adult attachment system may intensify negative affect and impulsivity (Scott, Levy, & Pincus, 2009).

A second study compared four competing models of the relationship between adult attachment style, impulsivity, aggressiveness and BPD features. It was found that individual differences in adult attachment patterns were directly related to impulsivity and aggression (which is considered another aspect of impulsivity). These, in turn, predicted but did not have a direct relationship with BPD. It was concluded that, in accord with Fonagy's (1991) hypothesis, the ability to regulate emotion and impulsivity is closely tied to the individual's mental representations of the psychological functioning of self and other, which is closely tied to attachment style (Fossati et al., 2005).

These results support a significant relationship between attachment style and impulsivity. However, impulsivity is more widely considered an individual personality trait with multiple dimensions and related phenomena, the development of which is affected by various influences such as temperamental factors, experiences unique to the individual, and the social environment (Evenden, 1999; Miller, Joseph & Tudway, 2004; Paris, 2005). Most relevant to an emotion regulation and therefore an attachment perspective is the impulsivity facet *urgency* (the tendency to engage in impulsive behaviour in order to alleviate negative affect; Whiteside & Lynam, 2001). However, prior to an exploration of urgency, and other facets proposed by Whiteside & Lynam (2001), there will be a brief introduction to the overall construct of impulsivity.

Impulsivity – Definitions, Measurement, and the Relationship to Emotion

Dysregulation

Impulsivity is featured in every major model of personality and is one of the most ubiquitous personality traits found in the fields of psychology and psychiatry (Whiteside, & Lynam, 2001). It is considered a personality trait that can potentially impact any area of an individual's life (McCown, 1993). Impulsivity is included as a defining criteria in 18 separate disorders in the DSM-IV including intermittent explosive disorder, borderline personality disorder, bulimia nervosa, and substance abuse disorders (American Psychiatric Association, 1994). It has been linked with personality disorders (Costa, 1986), substance and polysubstance abuse (O'Boyle, 1993), pathological gambling (Fischer, 2005), and other para-addictive behaviours such as deliberate self-harm (L'Abate, 1993). Impulsivity is believed to be associated with many forms of problematic behaviour in both clinical and non-clinical populations (Whiteside, Lynam, Miller, & Reynolds, 2005).

Although impulsivity as a construct is pervasive within psychology, there are many different conceptualisations which involve descriptions of different facets of personality and behaviours. Several personality researchers have presented different models of impulsivity that encompass a wide range of traits. Although there are many different factors proposed, many of these theories have common elements (Fischer, Smith, & Cyders, 2008).

Impulsivity has been described as a lack of forethought and failure to contemplate risks and consequences before acting (Cassin & Ranson, 2005), the tendency to engage in reckless behaviours and impulsive acts (Kane, Loxton, Staiger, & Dawe, 2004), a need

for novel activities, excitement and risk (Eysenck & Eysenck, 1985), and a tendency toward non-planning (Patton, Stanford, & Barratt, 1995). Impulsivity is described in terms such as “sensation seeking, risk taking, novelty seeking, boldness, adventuresomeness, boredom susceptibility, unreliability, and unorderedliness” (Depue & Collins, 1999; p.495).

Impulsive individuals are believed to have a lack of control over their thoughts and behaviours with a tendency to act quickly upon urges or environmental demands (McCown, 1993). They tend to have an inability to maintain focused attention, are prone to reckless action, have a lack of concern for the future (Rosval et al, 2006), and tend to be focused on achieving immediate objectives at the expense of long-term goals (McCown, 1993). An impulsive person may act without thinking, may act on the spur of the moment, may be restless when required to sit still, may be happy-go-lucky, and is likely to take chances, have difficulty concentrating, and act rather than think (Barratt, 1993). They tend towards difficulties with delaying gratification, have a desire to attain immediate reward, tend to be disinhibited and unable to restrain behaviour, and are distractible with an inability to maintain attention (Hollander, Baker, Kahn, & Stein, 2006).

Commonalities found in these conceptualisations are constructs representing a lack of forethought, sensation seeking, and an inability to delay gratification. These constructs have been found in several personality models. For example, among others, lack of forethought has been described in Buss and Plomin’s (1975) model of temperament, Costa and Mcrae’s (1992) Five Factor Model of Personality, Barratt’s (1993) three factor model of impulsivity, and Eysenck’s two part model of impulsivity

(Eysenck & Eysenck, 1985). Sensation seeking or thrill seeking has been presented in many models of personality including Buss and Plomin's (1975) model of temperament, Costa and Mcrae's (1992) Five Factor Model of Personality, and Cloninger's three part model of temperament (Cloninger, Svaric, & Przbeck, 1993), and has been included as part of a non-planning/sensation seeking factor in Eysenck's two part model of impulsivity (Eysenck & Eysenck, 1985). The ability to delay gratification, withstand boredom and maintain persistence has been represented in models by Barratt (1993), Buss & Plomin (1975), and Costa and McRae (1992).

These models tend not to directly acknowledge the contribution of emotion as it relates to impulsivity, despite increasing support for the role of emotion dysregulation in impulsive behaviours (Fischer, Smith, & Cyders, 2008). However, several models have included this as a component through references to neuroticism. Pickering & Gray (1999) described impulsivity as a combination of neuroticism and extraversion based on Eysenck & Eysenck's (1985) model of personality, where individuals with neuroticism and extraversion would be emotionally labile, have high emotional intensity, and engage in impulsive acts. Costa and McRae (1992) described acting without thinking, which they labelled impulsivity, as being a facet of neuroticism, where neuroticism is described as moodiness, anxiety, anger and self-consciousness (John & Srivastava, 1999).

Recently, the role of emotion dysregulation in impulsivity has been more clearly defined and has been accepted as a facet that falls under the impulsivity umbrella (Fischer, Smith, & Cyders, 2008) with an increasing body of research linking emotion dysregulation to impulsive behaviours such as binge eating and bulimia nervosa, and

substance abuse (Fischer, Smith, Spillane, & Cyders, 2005). This emotion dysregulation facet has been labelled *urgency* and was first defined by Whiteside and Lynam (2001).

Whiteside & Lynam. In an effort to determine distinct facets of impulsivity, Whiteside & Lynam (2001) identified dimensions of impulsivity that are common across existing impulsivity measures and placed them in a broad model of personality. The Five Factor Model of personality (FFM; McRae & Costa, 1990) was used to provide a framework from which to understand the various conceptualisations of impulsivity. The UPPS Impulsivity Scale was developed in an effort to overcome the lack of a commonly accepted taxonomy of the distinct personality facets that lead to impulsive behaviour and to increase the ability to synthesise independent lines of research (Whiteside & Lynam, 2001).

The UPPS Impulsivity Scale was derived from factor analysis of nine frequently used measures of impulsivity. Four discrete factors were identified and 45 items were selected to create the four subscales: urgency, (lack of) premeditation, (lack of) perseverance, and sensation-seeking (Whiteside & Lynam, 2001). These traits are not considered to be variations of impulsivity, but rather discrete psychological processes that result in impulsive-like behaviour (Whiteside, Lynam, Miller, & Reynolds, 2005). Confirmatory factor analysis has been performed on the UPPS with English and French speaking adults, as well as adolescents, suggesting that the facets of the UPPS scale reflect relatively stable personality factors (d'Acremont & Van der Linden, 2005).

Lack of premeditation refers to difficulty in thinking and reflecting on consequences before acting, and focusing on immediately gratifying rewards over more valued but delayed rewards. Lack of perseverance refers to an inability to remain focused

on a task that is boring or difficult and is associated with a lack of self-discipline. Sensation seeking has two aspects: the tendency to enjoy and pursue activities that are exciting, and openness to trying new experiences that may be dangerous (Whiteside & Lynam, 2001; Whiteside, et al., 2005). Sensation seeking is considered a facet of extraversion, whereas lack of deliberation and lack of persistence are both considered facets of conscientiousness (Fischer, Smith, Spillane, & Cyders, 2005). Urgency refers to the tendency to engage in impulsive behaviour in order to alleviate negative affect, despite the potential long-term consequences and is considered to represent the impulsivity facet of neuroticism from the Five Factor model of personality (FFM; McRae & Costa, 1990). Scales loading on this facet included inhibitory control (Buss & Plomin, 1975), attentional impulsiveness (Barratt, 1993), and the impulsivity dimension of neuroticism (Costa & McRae, 1992).

Urgency. A considerable amount of research has been emerging utilising the UPPS as a measure of impulsivity with a specific focus on the facet urgency. What has been of particular interest is the role of urgency in relation to eating disorders, pathological gambling, and substance use (Fischer, Smith, Spillane, & Cyders, 2005). Urgency has been described as the *craving* factor indicating an uncontrolled impulse to eat or drink in response to distress. It has been suggested that it may be the mechanism by which negative affectivity results in maladaptive and impulsive action. Urgency has been found to correlate with negative mood and rash, maladaptive actions (Fischer, Smith, Spillane, & Cyders, 2005). It has been found to be positively correlated to the binge eating and purging characteristic of bulimia nervosa, problems with alcohol use and pathological levels of gambling. Although other impulsivity constructs are associated

with frequency of drinking or gambling, urgency is uniquely associated with problem drinking and problem gambling. It is also uniquely associated with binge eating behaviours (Anderson & Smith, 2001; Fischer, Anderson, & Smith, 2004; Smith et al., 2007). It was found in a study of 130 clinical participants with various diagnoses, that after controlling for other facets of impulsivity, depressive and anxiety symptoms, general functioning, positive and negative affect, suicidal ideation, and anxiety sensitivity, urgency was the only significant predictor of bulimic symptoms (Anestis, Smith, Fink, & Joiner, 2009).

It has been suggested that the link between urgency and problem behaviours operates in the following way. Engaging in impulsive behaviour when distressed may be distracting, mood altering, or pleasant, resulting in a decrease in distress. This behaviour is therefore more likely to be pursued when distressed in future, preventing the high urgency individual from developing more effective coping strategies and thereby increasing the problem behaviours (Smith, Cyders, Annus, Spillane, & McCarthy, 2007). Researchers proposed that urgency may be related to the inability to suppress dominant or automatic responses related to eating especially when emotionally distressed, thereby resulting in emotional eating. Additionally, it was suggested that over-eating is an automatic response to alleviate negative emotion in the short-term, which is likely to increase future binge episodes. An increase in binge episodes is likely to lead to increased weight gain thereby leading to greater concern for dieting (Mobbs, Ghisletta, & Van der Linden, 2008). These researchers also found that high urgency was related to binge episodes and continued weight concerns (Mobbs et al., 2010).

Recently urgency has been theorised to be a heritable trait that is influenced by environment and expectancies. It is considered to be a general and distal risk factor for various types of addictive behaviours, influencing the individual to self-medicate with behaviours such as binge eating, drinking, or gambling (Fischer, Smith, Spillane, & Cyders, 2005). Trait urgency is believed to increase the likelihood that one will engage in some form of rash maladaptive behaviour in response to distress with the environment believed to determine exactly which impulsive behaviour will be pursued. For example, women with bulimia may have learned to expect the alleviation of negative mood through eating leading them to binge. They may simultaneously hold the overgeneralised belief that life will be improved, or that they will be more lovable by being thin, resulting in purging or excessive food restriction following the binge. As these behaviours provide temporary relief from negative mood states, they act as a negative reinforcer, perpetuating the use of rash acts to alleviate distress (Fischer, Smith, & Cyders, 2006). It is therefore possible that emotion dysregulation and urgency may be a key component in motivating the expression of impulsive behaviours to pathological limits.

As previously mentioned, urgency has been found to be uniquely associated with binge eating behaviours which are common to both bulimia nervosa and binge eating disorder (Anderson & Smith, 2001; Fischer, Anderson, & Smith, 2004). In addition to the association with urgency, these disorders have been found to be characterised by a tendency towards other impulsive behaviours (e.g. substance abuse; Pearlstein, 2002), emotion dysregulation (Stice & Agras, 1999), and have been commonly found to have an over-representation of insecure attachment orientations (ranges reported from 64% to 96%; Johnson, Maddeaux, & Blomin, 1998). These eating disorders therefore provide a

foundation for exploring the relationships the constructs of attachment, impulsivity and emotional dysregulation have with each other and how they manifest in a clinical population.

Chapter 3

Eating Disorders – Bulimia Nervosa and Binge Eating Disorder

Eating disorders are characterised by either insufficient or excessive consumption of food to the detriment of the individual's physical health (Kotler, Boudreau, & Devlin, 2003). Media portrayal of, and public fascination with, personal accounts of struggles with eating disorders have increased, along with an increase in eating disorder prevalence (Orbanic, 2001).

Multiple pathways have been suggested in the development of eating disorders. They have been linked with disturbances in family relationships, early attachment relationships, and separation-individuation dilemma's (Marsden, Meyer, Fuller, & Waller, 2002). Individual traits such as impulsivity have been suggested as predisposing individuals to certain eating disorders (e.g. bulimia nervosa) and loss of control and the attempt to regain it has been suggested as being a maintaining factor across the range of eating disorders (Reindl, 2001).

Eating disorders are often comorbid with other mental health issues such as depression, anxiety, and Axis II disorders with approximately 50% of women with bulimia reporting high levels of depression and anxiety, and approximately 45% of both bulimic and anorexic women meeting the criteria for a personality disorder (Patton, Coffey, & Sawyer, 2003; Pearlstein, 2002). Comorbidity complicates treatment which is often already challenging (Pearlstein, 2002). As previously mentioned, the high rates of emotion dysregulation (including mood disorders), impulsivity, and over-representation of insecure attachment style found in women with bulimia creates a good foundation for the exploration of these constructs in this eating disorder as well binge eating disorder.

Bulimia Nervosa – Models, Emotion Dysregulation, and Impulsivity

Bulimia nervosa is estimated to affect from 1% to 4% of the general female population, but as many as 5% to 10% of university students (Koo-Loeb, Costello, Light, & Girdler, 2000). The incidence of bulimia nervosa has been reported to have increased noticeably over the last 50 years, however, this may be attributed to greater awareness and reporting of the disorder (Polivy & Herman, 2002). Bulimia nervosa shows high comorbidity with mood disorders (estimates range from 6% to 95%), substance abuse (30% to 70%), personality disorders (45% to 67%), and prior childhood sexual abuse (27% to 51%) (Pearlstein, 2002).

Bulimia can be difficult to detect as the presence of this eating disorder is not often apparent through physical appearance alone (Polivy & Herman, 2002). As it is also considered a disorder characterised by secrecy and shame, those with bulimia infrequently seek treatment for bulimic symptoms (Orbanic, 2001). The binge/purge cycle can be profoundly distressing but the fear of being judged, or of being diagnosed with a mental illness often outweighs the desire to obtain help for the distress (Polivy & Herman, 2002). For this reason, the prevalence of bulimia is believed to be gravely underreported (Orbanic, 2001).

Although perceptions are changing, it may not be recognised that BN is a serious eating disorder. Women with BN do not waste away like women with Anorexia Nervosa and are often very attractive, successful women. However, BN can lead to serious medical conditions including electrolyte imbalances which can lead to an irregular heartbeat; vomiting can rupture the oesophagus; malnutrition from purging undigested food can impair mental, sensory and emotional functioning. Vomiting can be painful and

sometimes the urge to vomit can be so strong that these women will vomit 50-70 times per day. This can impair the ability to maintain employment and seriously affect interpersonal relationships (Blume, 1990).

The women who seek treatment, often do so for reasons unrelated to disturbed eating patterns such as medical complications, identity disturbances, or experiences of negative affect (Polivy & Herman, 2002). Women with bulimia tend to be reluctant to relinquish bingeing and purging behaviours as control of eating patterns may represent the only control the bulimic woman perceives she has. These behaviours may also represent the most effective means available for emotion regulation and emotion communication (Trattner-Sherman & Thompson, 1990), possibly creating additional barriers to treatments that endorse the explicit goal of eliminating disordered eating.

Current treatments focusing on eating behaviours and thoughts related to eating behaviours report low rates of complete recovery and have high relapse rate (Openshaw, Waller, & Sperlinger, 2004). This may indicate a need to identify additional contributing factors and develop treatments that target these maintaining factors. Many factors are theorised to be contributors to the maintenance of disturbed eating (Tobin, 2002), including difficulties with emotion regulation (Stice & Agras, 1999), and interpersonal difficulties (Wilfley et al., 1993). However, research and treatment in these areas has lagged behind theoretical development. Few treatments focus on emotion regulation or factors such as impulsivity that have been demonstrated in theory as being central to the maintenance of bulimic symptoms (Fischer, Anderson, & Smith, 2004). At present, the most commonly studied and employed psychosocial treatment for bulimia nervosa is

cognitive-behavioural therapy for bulimia nervosa (CBT-BN; Fairburn, Cooper, & Cooper, 1986).

Issues and changes to the current cognitive behavioural theory of bulimia

nervosa. The CBT-BN perspective (e.g., Fairburn, Cooper, & Cooper, 1986) describes a dysfunctional system for evaluating self-worth as central to the maintenance of bulimia. People with eating disorders are believed to judge themselves largely on their eating habits, weight and body shape, as well as their ability to control them. This is considered to be the ‘core psychopathology’ that other clinical features stem from. Binge eating is thought to result from self-imposed strict dietary rules that, when broken, are considered evidence of a lack of self-control, which then leads to temporary abandonment of eating restriction. However, research fails to find consistent support for dietary restraint predicting binge eating (Steiger, Lehoux, & Gauvin, 1998; Stice, 2001). It has been found that in highly impulsive bulimic women, bingeing has no relationship with dietary restraint and is attributed instead as a failure to engage impulse-control skills (Steiger et al., 1998).

The CBT-BN model specifically states that binges are likely to be preceded by acute changes in mood, particularly negative mood states. Binges can temporarily relieve and distract from emotional difficulties and are, therefore, reinforced (Fairburn, Cooper, & Cooper, 1986). Despite this hypothesis and ample supporting evidence of the role of negative affect and emotion regulation in binge eating (Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003; Wheeler, Greiner, & Boulton, 2005), the CBT-BN model does not consider bulimic behaviour to be a strategy for regulating emotions. However, the model was recently revised to include four additional maintaining processes, one or

more of which may interact with the core eating-disorder maintaining mechanisms (Fairburn, Cooper, and Shafran, 2003). These are: clinical perfectionism (a system for self-evaluation where self-worth is judged by striving for and success at reaching demanding goals), core low self-esteem (unconditional and pervasive negative evaluation of the self which is seen as a permanent part of identity), interpersonal difficulties (adverse interpersonal events often precede a binge episode), and mood intolerance (an inability to cope appropriately with certain emotional states). Additional maintaining processes may only affect certain individuals and are believed to account for the lack of treatment response in some individuals. Revisions to the model have as yet been theoretical, and current research has not examined treatment that has included the additional maintaining factors (e.g. mood intolerance).

Commonalities in mood intolerance and emotion dysregulation. There is considerable overlap in definitions of mood intolerance and emotion dysregulation. It has been suggested that mood intolerance, like emotion regulation, can be applied to both positive and negative mood states, but is usually associated with adverse mood states such as anger or depression (Fairburn, 2002; Gross, 1998). Specifically related to bulimia nervosa, Fairburn, and colleagues (2003), posit that bulimic individuals are unable to accept current mood changes and resort to “dysfunctional mood modulatory behaviour” to decrease awareness of the triggering mood state (p.517). This is consistent with theories of emotion regulation, where efforts to relieve negative affect result in tension reducing behaviours that have immediate effects (Bydlowski, et al., 2005; Lyubormirsky, Sousa, & Casper, 2001). Both CBT and emotion regulation models posit that mood modulatory behaviour may result in impulsive behaviours such as self-injury, drug use,

binge eating, self-induced vomiting and intense exercising. Mood modulatory behaviours may serve an emotion regulation function by relieving negative affect (Penas-Lledo, Vaz, Ramos, & Waller, 2002). These behaviours rapidly dissipate the initial mood state and may become a habitual means of mood modulation (Fairburn, Cooper, & Shafran, 2003).

The initial mood state is believed to be amplified by accompanying thoughts of not being able to cope with the mood state (Fairburn, Cooper, & Shafran, 2003). In other words, cognitive elaboration (e.g. “I can’t cope with these feelings”), leads to intensified feelings of inadequacy, shame and guilt (Reindl, 2001). However, if the original mood state were able to be tolerated, or at least accepted, accompanying cognitive elaboration and increased emotional arousal may be avoided. An increase in the perceived or actual ability to tolerate the initial mood state would more than likely result in a reduction of negative cognitive evaluation of coping ability (Baer, 2003; Hayes, Strosahl, & Wilson, 1999).

Negative evaluations of the self via cognitions regarding weight and body shape is similarly proposed to be associated with, but are not necessarily the causes of, emotions such as anxiety, depression, and guilt (Cooper, Wells, & Todd, 2004). Negative emotional states rather than negative cognitions have been found to precede both binge and purge episodes (Stice, Akutagawa, Gaggan, & Agras, 2000). Negative cognitions and self-evaluation in isolation may therefore not lead to bulimic behaviours, leaving the inability to tolerate the accompanying affective state as the critical trigger to bingeing and purging. In support of this, triggers to binge and purge episodes have been reported as being unrelated to food or body-image related cues (Cooper, Wells, & Todd, 2004), which suggests the possibility that self-evaluation in terms of eating habits, weight and

shape may not be the only ‘core psychopathology’ in the maintenance of bulimia nervosa. It is not disputed that these clinical features are peculiar to eating disorders, however, when developing additions to the current theory, even Fairburn, Cooper and Shafran (2003) conceded that there was a need for revised conceptualisations of the processes that maintain bulimia nervosa and included processes related to emotion regulation.

Models of bulimia nervosa from an emotion regulation perspective. One model of bulimia nervosa suggests that bingeing and purging may originally develop as an attempt to control weight but the longer the individual is bulimic the more the bingeing and purging generalises to other issues, and eventually becomes the primary means of emotion regulation (Stice & Agras, 1999). This model is somewhat consistent with the dual pathway model of bulimia where negative affect, dietary restraint, or both combine to promote bulimic pathology (Stice & Agras, 1999). While this model parallels the dual pathway model in the role of overconcern with weight and shape in the maintenance of bulimia, it instead argues that problems with emotion precede the importance placed on weight loss. Weight and eating are not considered to be the problem, but rather the symptoms, and are a response to inherent difficulties with emotion regulation (Trattner-Sherman & Thompson, 1990).

Heatherton & Baumeister (1991) have proposed a model of binge eating and bulimia nervosa as disorders of emotion regulation. The behaviours have been described as means of escaping aversive self-awareness and intolerable emotions. Aversive self-awareness (acute awareness of failures, short-comings, loneliness, and unfulfilled cravings for nurturance) is believed to generate negative affect. This negative affect becomes the immediate factor motivating the desire to escape and engage in bulimic

behaviours. As these negative emotions may seem overwhelming and the ability to self-soothe may not be available, impulse-driven behaviours such as binge eating may be engaged in as a momentary escape from aversive states (Tice, Bratslavsky, & Baumeister, 2001). Awareness is narrowed during the binge episode to the present and immediate environment and meaningful processing of emotions or thoughts is avoided, thereby reducing distress. Eating is a distraction that is associated with a general lowering of arousal and a decrease in intensity of emotion states (Fischer, Anderson, & Smith, 2004). The role of purging, according to this view, is an impulsive act to manage the negative feelings that arise following a binge (Heatherton & Baumeister, 1991).

Similar models have been proposed specifically for bulimia nervosa (Reindl, 2001). Bingeing and purging are believed to be maladaptive emotion regulation strategies that serve as a defense against negative feelings, particularly guilt, shame, anger, loneliness and sadness. Intense focus on external cues (calorie counting, weight and body shape) is believed to aid in obscuring negative self-evaluations from awareness so that the tension aroused by these evaluations may be dissipated. Bulimic behaviours and preoccupations consume attention and energy and serve as distractions from emotional pain. Continued disconnection from subjective experience serves to maintain the bulimic behaviour (Reindl, 2001).

In support of this model, it has been noted that the effort required by avoidance serves to interfere with awareness and clarity of emotions (Gross & John, 2003) creating a vicious cycle that maintains emotional avoidance and distress intolerance, which have both been found to contribute to bulimic behaviour (Bradley, 2003; Hayes & Feldman, 2004; Linehan, 1993). Avoidance of internal states may not be restricted to emotional

avoidance but may encompass hunger and satiety cues as well (Reindl, 2001). Without adequate awareness of internal cues, disordered eating is likely to be maintained.

In further support of these models, there are additional indicators that women with bulimia have difficulties with emotion regulation. They have been found to have difficulty in identifying and labelling emotion (Mazzeo & Espelage, 2002) which places them at a disadvantage for regulating emotions. Negative emotions particularly, are considered to be the most difficult to regulate (Bradley, 2003; Feldman-Barrett, Gross, Christensen, & Benvenuto, 2001). Intense negative emotions such as anger, sadness or fear may signal the need for active coping, but although bulimic individuals may experience these emotions strongly, they may not be able to identify what they are feeling with precision and clarity, making it difficult to employ appropriate emotion regulation strategies (Feldman-Barrett et al., 2001). Bulimic women may not learn to tolerate distress and may experience negative affect as being relentless and continuous so that impulsive tension reducing behaviours with immediate effect will be employed (Gross, 1998). Without the ability to manage negative affect, bulimic and impulsive behaviours are likely to be maintained (Feldman-Barrett et al., 2001).

Impulsivity in bulimia nervosa. The tendency towards impulsive behaviours in the face of negative affect indicates there may be a relationship between emotion dysregulation and impulsivity (Claes, Vandereycken & Vertommen, 2005). Current conceptualisations of bulimia nervosa have hypothesised that either emotion regulation or impulsivity, or a combination of the two, are fundamental to the maintenance of the disorder (Fischer, Anderson, & Smith, 2004; Reindl, 2001; Whiteside & Lynam, 2005).

Models of bulimia nervosa that incorporate impulsivity. There is only one model that specifically explains BN from an impulsivity perspective. This model has developed using *negative urgency* as the underlying feature. This model proposes that when distress arises, individuals with the impulsive trait of negative urgency are more prone to act rashly and engage in immediate tension relieving activities such as bingeing and purging (Fischer, Anderson, & Smith, 2004; Fischer, Smith, & Cyders, 2008). Later additions to this model suggest that the heritable trait of urgency, combined with the expectancy of alleviation of negative mood through eating, as well as key environmental influences that promote a focus on body image lead to eating disorders such as BN (Fischer, Smith, & Cyders, 2006). However, urgency, by definition, is an impulsive trait that is driven by emotion dysregulation, indicating how difficult it is to separate impulsivity and emotion dysregulation in this disorder.

The influence of impulsivity is intertwined with emotion dysregulation in other theories. For example, it has been suggested that difficulties in tolerating distressing emotions may increase impulsive acts (e.g., bingeing) as a means of distraction, leaving the emotion to persist and accumulate unresolved (Bradley, 2003). These impulsive acts may be seen as a form of discharge of the dysregulated and tension producing negative emotions experienced (L'Abate, 1993). Impulsive acts such as bingeing and purging may indicate an attempt to avoid the disorganising effects of chaotic emotions, which would otherwise have to be experienced and held internally, making them more distressing (Marks-Tarlow, 1993).

Despite the tension relieving properties of binge episodes, following the binge negative emotions tend to increase, particularly depression, self-loathing, disgust, shame

and guilt (Cooper, Wells, & Todd, 2004). Purging has been found to produce an immediate effect in alleviating distress (both physical and emotional; Fischer, Anderson, & Smith, 2004) and would provide another opportunity to discharge these intolerable emotional states (L'Abate, 1993). The more impulsive the individual is, or the more internally chaotic, the more likely they would be to utilise purging as a tension reducing behaviour (Fischer, Anderson, & Smith, 2004; Marks-Tarlow, 1993).

In support of the comorbidity of emotion dysregulation and impulsivity in bulimia nervosa, bulimic women have been found to have an impaired ability to regulate emotional and physical states (Goodsitt, 1983). In a study examining distress tolerance and urgency as predictors of bulimia as measured by the EDI, it was found that low distress tolerance and high urgency predicted bulimia over and above other EDI subscales and other impulsivity scales. It was concluded that individuals who find negative affect to be intolerable and who are likely to engage in impulsive behaviours to reduce immediate tension are more likely to report elevated bulimic symptoms (Anestis, Selby, Fink, & Joiner, 2007).

Deficits in emotion regulation for bulimic women tend to manifest in poor impulse control, emotional lability, and substance abuse (Reindl, 2001; Steiner & Lock, 1998). They are likely to manifest mood disorders and approximately 30% will abuse alcohol (Rodreguez-Srednicki & Twaite, 2006). Bulimic individuals tend to be affectively labile and undercontrolled (Steiner & Lock, 1998), excitable, and dramatic (Cassin & von Ranson, 2005). They tend to score high on measures of impulsivity, sensation-seeking, neuroticism (a predisposition towards emotionality, moodiness, and

depression), and have high stress reactivity that can result in impulsive behaviours (Cassin & von Ranson, 2005).

Individuals with bulimia also show a high prevalence of comorbid mood disorders e.g. depression, anxiety, and alexithymia (Larson & Johnson, 1985), and personality disorders characterised by impulsivity and emotion dysregulation, mostly cluster B, especially Borderline Personality Disorder (Vervaeke, Heeringen & Audenaert, 2004). The severity of these disorders is positively associated with the extent of impulsive behaviours (Bushnell, Wells, & Oakley-Browne, 1996; Penas-Lledo, Vaz, Ramos, & Waller, 2002).

Impulsivity and bulimia nervosa. As previously mentioned, studies attempting to relate impulsivity to bulimia nervosa and binge eating have demonstrated inconclusive findings and effect sizes have been small (Stice 2002). There is growing evidence that these inconsistent findings occur because the broad construct of impulsivity includes several more specific constructs that are only moderately related to each other and which account for different phenomena (d'Acremont & Van der Linden, 2005; Evendon, 1999; Whiteside & Lynam, 2001).

For example binge eating behaviour does not necessarily reflect a lack of forethought or an inability to remain focused on a task (Fischer, Smith, & Cyders, 2006). There is often a considerable amount of planning and forethought that precedes a binge episode. There may be a careful planning of route in the drive home in order to have access to favoured binge foods or meticulous preparation for the purchase of large amounts of favourite foods prior to a binge. Bulimic behaviour is not necessarily the pursuit of novel experiences. The binge/purge cycle is repetitive and distressing.

Therefore not all dimensions of impulsivity appear to influence these behaviours. There may not be general impulsiveness but with the combination of a tendency to act rashly when distressed and environmental influences such as a societal thin ideal, and the expectancy that eating will relieve a negative mood there is increased risk for BN or BED (Fischer, Smith, & Cyders, 2006).

The most recent meta-analytic study of the role of impulsivity in BN, found that the effect sizes for the various impulsivity subscales were as follows: urgency .38; sensation seeking .16; lack of persistence .18; and lack of planning .20. It was concluded that urgency is central to the expression of BN, where acting rashly while experiencing negative emotions increases vulnerability for eating disorders to a larger extent than other impulsivity facets (Fischer, Smith, & Cyders, 2008).

In an earlier study, it was also found that each impulsivity facet from the UPPS was related to different problem behaviours. For example, sensation seeking was related to positive and negative risk taking, lack of premeditation was related to antisocial behaviours, lack of perseverance was related to hyperactivity and inattention, and urgency was related to emotion dysregulation, depression and anxiety (D'Acremont & Van der Linden, 2005). Individuals high on multiple facets would therefore be more likely to demonstrate a range of impulsive behaviours rather than disordered eating specifically.

Some individuals with BN have been found to engage in multiple impulsive behaviours such as deliberate self-harm, alcohol and substance use and abuse, sexual disinhibition, and shoplifting. Individuals with comorbid BN and at least three other impulsive behaviours (multi-impulsives) have been found to be generally more treatment

resistant (Evans, Searle, & Dolan, 1998; Myers et al., 2006). Multi-impulsive individuals that engage in at least three of the following: severe alcohol abuse, drug abuse, self-harm, suicide attempt, stealing, or sexual promiscuity have been found to have higher levels of anxiety disorders, child abuse, and more self-damaging behaviors than the non-multi-impulsive bulimics (Myers, et al., 2006). Marks-Tarlow (1993) argues that these individuals are likely to have a relative absence of internal structure, making disruptive emotions more difficult to deal with resulting in more impulsivity. The multiple expressions of impulsivity reflect the continual presence of intrapsychic chaos. This lack of internal cohesion may be due to the disorganizing effects of abuse and poor quality early attachment relationships (Johnson, 2002). This may result in the individual being more susceptible to the influence of the multiple facets of impulsivity.

Apart from individual's labeled multi-impulsives, research suggests that urgency, rather than a unitary conceptualisation of impulsivity, has the most impact on disordered eating (Fischer, Smith, & Cyders, 2006; Fischer, Smith, & Cyders, 2008), as well as on emotion dysregulation (D'Acremont & Van der Linden, 2005). Therefore addressing urgency and emotion dysregulation when treating binge eating disorders may be more helpful than including aspects to the intervention that address other aspects of impulsivity.

Additionally, as emotion dysregulation is believed to arise from early attachment insecurity and impulsivity has been suggested as being a secondary attachment behavior in the absence of secure attachment relationships, it may be possible that attachment orientation plays a significant part in disordered eating.

Attachment, secondary attachment behaviours, and bulimia nervosa.

Disturbances in attachment have been frequently found to be associated with BN and associated eating disordered pathology (Ward, Ramsay, & Treasure, 2000). Between 64% and 96% of adolescents with eating disorders exhibit an insecure attachment style, while this percentage would be approximately 24% in a non-clinical population (Johnson, Maddeaux, & Blomin, 1998). Within the attachment literature, two major types of secondary strategies have been identified (Main, 1990). A deactivating strategy develops when an individual perceives an attachment figure as ignoring or rejecting of attachment signals. In order to deactivate attachment needs, attention is diverted from needs for support and comfort to a focus on dieting and body image with reduced attention to interoceptive and distress cues. This serves to minimise personal vulnerability while improving the chances of garnering approval (Cole-Detke & Kobak, 1996). In adults, this strategy is linked with an avoidant attachment style (Johnson, Maddeaux, & Blouin, 1998).

A hyperactivating strategy develops when an individual perceives attachment figures as inconsistently responsive (Main, 1990). This strategy has been described as being reflective of an anxious attachment style (Johnson, Maddeaux, & Blouin, 1998). In order to maximize the amount of support received, the person becomes hypervigilant to attachment cues both externally and internally, increasing self-focus and exaggerating distress (Main, 1990). This strategy has been found to be related to depression but has also been found to be associated with BN (Cole-Detke & Kobak, 1996; Candelori & Ciocca, 1998). Where both depression and BN were present, hyperactivating strategies

were employed. This depression and BN subgroup also had the most severe levels of symptomatology (Cole-Detke & Kobak, 1996).

A review of attachment style in people with eating disorders found that individuals with AN or restricting behaviours tended to be dismissive or avoidant, while those with bulimic behaviours i.e. bingeing or engaging in compensatory behaviours tended to have an anxious or preoccupied style. Research has yet to determine the most common attachment style for those with Binge Eating Disorder. It is suggested that eating disorder symptoms exist in the service of maintaining connectedness and seeking approval, while avoiding rejection from an insecurely perceived caregiver (Ward, Ramsay, & Treasure, 2000). It is unclear if this is the function of binge eating in those with Binge Eating Disorder.

Binge Eating Disorder (BED) – Models, Emotion Dysregulation and Impulsivity

BED is believed to effect from approximately 1% to 5% of the population with less of a gender difference than Bulimia Nervosa (BN). As opposed to BN, sufferers tend to have more problems with weight as they do not engage in compensatory behaviours. From 15% to 50% of individuals in weight loss programs have been found to meet the criteria for BED (American Psychiatric Association, 2000; Striegel-Moore, 2003). There is a growing obesity epidemic in developed countries and with it obesity related diseases e.g. type II diabetes (Yanovski, 2003). The Australian National Health Survey for 2004-2005 found that 17.8% of males and 15.1% of females were obese (Australian Bureau of Statistics) with approximately 25% of these likely to meet the criteria for BED (Yanovski, 2003).

The DSM-IV describes BED as recurrent, uncontrollable, distressing binge eating without the inappropriate compensatory behaviours found with BN. Impaired control is indicated by rapid eating, eating until uncomfortably full, secretive eating, and eating large amounts of food when not hungry (American Psychiatric Association, 2004). Additionally, BED is associated with marked distress which manifests in ways that include: embarrassment over the amount of food consumed, feelings of disgust, guilt, and depression after eating, as well as unpleasant affective states during and after the binge. Binge episodes may be triggered by dysphoric moods, and even when particular triggers cannot be identified, individuals report a non-specific feeling of tension that was relieved by bingeing. Similar to BN individuals, the binge episodes have been described as having a dissociative quality to them although other reports indicate that BED binges have an hedonic quality to them that is lacking in BN (American Psychiatric Association, 2004; Davis, et al., 2008). In comparison to women of equal weight without this disorder, women with BED tend to report higher rates of self-loathing, self-disgust, depression, anxiety, and interpersonal sensitivity (American Psychiatric Association, 2004). As with BN, BED is a disorder characterised by secrecy and shame. Individuals who binge are not likely to seek treatment for, or admit to, binge eating but will seek help in addressing the complications e.g. weight problems (McElroy, 2006).

Similarities between bulimia nervosa and binge eating disorder. BED has been included as an eating disorder not otherwise specified in DSM-IV. There is some controversy over whether the diagnosis is sufficiently different from bulimia nervosa-non purging type or from non-purging obesity to be considered a separate diagnosis (Davis, et al., 2008; Vervaet, Heeringen, & Audenaert, 2004). Individuals who met the criteria for

BED are differentiated from non-BED obese individuals by the severity of the binge and the psychological distress at weight and shape concerns (Wilfley, 2003). Similarities between BED and BN (such as quality of parenting, parental weight concern, and parental psychopathology) have been found in the family environments of individuals with these disorders and there are similar patterns of personality characteristics, namely novelty seeking, harm avoidance and reward dependence (Manwaring et al., 2006; Vervaet, Heeringen, & Audenaert, 2004). Those with BN tend to have greater identity instability, lower self-efficacy, but not lower self-esteem than those with BED (Tasca, Balfour, Kurichh, Potvin-Kent, & Bissada, 2006)

However, there are a large number of similarities between those with BED and BN. Individuals with BED are significantly more sensitive to reward and punishment than non-BED over-eaters, indicating that they have a tendency toward greater anxiety and impulsivity (Davis et al., 2008). They are reported to have higher rates of comorbid mood, anxiety, and substance use disorders than controls and have a greater emotion dysregulation component with binges reportedly being preceded by a negative mood state (McElroy & Kotwal, 2006; Vervaet, Heeringen, & Audenaert, 2004). When interviewed, women with BED reported the following themes: an emotional connection to food, loss of control, isolative behaviour and secrecy, cognitive obsessions, sense of not belonging/not fitting in, feelings of being not good enough, and poor body image (Julyanna, 2007).

Models of binge eating disorder. There have been a number of models proposed on the influences and maintaining factors of BED. There is a focus on both dieting and emotion regulation. According to the restraint theory of BED, there is an obsessive desire

for thinness, which leads to unrealistic dieting and restraint. This in turn leads to bingeing in response to excessive deprivation (Howard & Porzelius, 1999). However, research suggests that unlike BN, dieting and desire for weight loss does not precede the onset of BED, and binge eating is likely the cause, and not the consequence of the disorder (Vervaet, Heeringen, & Audenaert, 2004). The abstinence violation effect is similar to restraint theory and suggests that the inevitable violation of dietary restraint results in dichotomous thinking (e.g. perfect restraint versus complete failure) which in turn results in negative mood and weakens attempts to control eating. Binge eating then occurs followed by attempts to restrict eating (Grilo & Shiffman, 1994). However, individuals with BED may not restrict in the first place. It was found that 46% of women had never engaged in restrained dieting, and 81% began binge eating before attempting to diet (Manwaring, et al., 2006).

Models of binge eating disorder from an emotion regulation perspective. When discussing dieting and overeating, a number of hypotheses were presented that are considered relevant to binge eating disorder (Polivy & Herman, 1998). The comfort hypothesis suggests that binge eating may essentially provide comfort in the face of distress. The distraction theory posits that bingeing serves as a distraction from distress where eating may be sufficiently engrossing to keep attention away from the distress experienced. Masking theory suggests that overeating may serve a defensive or masking function. Rather than dwelling on negative self-evaluations and emotions that are the actual cause of distress, binge eating may provide a ‘mask’ for these emotions and self-evaluations. It is presumably more manageable to have the binge as the problem than the actual source of one’s distress. A binge may be perceived as both tolerable and

controllable where negative emotion may not. In a study investigating these hypotheses, it was found that masking and distraction both received some support, and it was suggested that they may operate in tandem (Polivy & Herman, 1998)

Binge eating may also provide a substitute for friendship and nurturing, and be a replacement for love and affection thereby serving the emotion regulation function of a close other (Johnson, 2002; Rodreguez-Srednicki & Twaite, 2006). It may be seen as a source of comfort, a means of escape, and a way to disconnect from emotional pain (Rodreguez-Srednicki & Twaite, 2006). If there is dissociation while bingeing, there is interference with the normal storage, retrieval, and integration of thoughts feelings, sensations, and memory. Overeating may normally be constrained by awareness of the consequences such as weight gain, guilt, and self-hatred. With dissociation, awareness of the constraints are removed, allowing individuals to obtain gratification and relief from distressing emotions while bingeing (Rodreguez-Srednicki & Twaite, 2006).

Emotional overeating has been considered as a precursor to binges in BED, as well as being related to the frequency of binges, eating disorder features such as overevaluation of weight and shape, and depression (Masheb & Grilo, 2006). There is evidence to suggest that for individuals with BED, the presence of negative mood is related to whether overeating is considered to be a binge and if it feels out of control (Telch & Agras, 1996). According to participants' own attributions for binge episodes and their self-rated mood before and after binge episodes, negative affect was found to be the clearest precursor to binge eating. The researchers state that ironically, despite the self-defined primary purpose of a binge episode being to alleviate negative mood, binge

eating actually serves to increase negative emotions, leaving them unclear as to how binge eating provides sufficient reinforcement to perpetuate (Stein et al, 2007).

In support of BED being related to emotion dysregulation, it was found that women with BED had elevated levels of psychopathology, most notably mood disorders and impulsivity (Mitchell & Mussell, 1995). They were found to be more likely to have a lifetime history of depression, anxiety, and personality disorders than weight-matched controls (Yanovski, 1993). Compared with obese only individuals, those with BED reported greater depression, anxiety, and a trend towards more alcohol use/abuse (Grucza, Przybeck, & Cloninger, 2007). Compared to women who do not binge, those that do found daily hassles significantly more stressful. They were also more likely to engage in binge eating and consume significantly more calories on days characterised by higher levels of stress (Crowther, Sanftner, Bonifazi, & Shepherd, 2001).

In a study examining the differences between women with BED subtypes (binge first versus diet first), it was found that women who binged first (81%) were more likely to have experienced a distressing event such as the death of a close relative prior to the onset of the binges indicating that the bingeing began in response to emotional distress. The diet first group (19%) were more likely to have had a history of sexual abuse which significantly increases the risk for the use of weight control techniques and emotion dysregulation (Manwaring, et al., 2006).

In support of emotion dysregulation emerging from early insecure attachment relationships, BED individuals tend to have less family cohesiveness, more conflict, and less encouragement to express honest feelings in the family environment than other eating disordered groups (Hodges, Cochrane, & Brewerton, 1998). Subtypes of BED with

a history of mood disorders have more distress, more frequent trauma history, and greater eating disorder pathology (Peterson, Miller, Crow, Thuras, & Mitchell, 2005). Less social support has been found to be associated with a greater likelihood of same-day bingeing in individuals with BED (Freeman & Gil, 2004).

Models of binge eating disorder from an impulsivity perspective. It has also been suggested that BED meets the criteria for an impulse control disorder (ICD). ICD's are characterised by an inability to control irresistible urges to perform senseless or harmful behaviours, and the failure to resist impulses. Irresistible impulses and impulsive behaviours of ICD's are often associated with affective disturbances. The DSM-IV TR says "the individual feels an increasing sense of tension or arousal before committing the act and then feels an experience of pleasure, gratification, or relief at the time of committing the act. Following there may or may not be regret, self-reproach, or guilt" (American Psychiatric Association, 2000, p.663).

BED further resembles an ICD via the process of the binge and the link to impaired affect regulation: initial dysphoria with an anxious component occurs prior to, or with the urge to binge; the binge produces relief of dysphoria and mood elevation; there is dysphoria with a depressive component after the act of bingeing. BED also resembles an ICD in that it is frequently associated with poor insight, denial, ego-syntonicity (McElroy & Kotwal, 2006).

In a review of research on impulsivity in women with eating disorders, it appeared that women with BN and BED had higher rates of impulsive behaviour (other than binge eating) than community and AN samples, and had higher rates of self-reported impulsivity (McElroy & Kotwal, 2006). They were more likely to engage in deliberate

self-harm, showed greater cognitive impulsivity, and more obsessive thinking about food (Paul, Schroeter, Dahme, & Nutzinger, 2002). What is apparent is that BED appears to have an emotion dysregulation component along with difficulties controlling impulses. Bulimia Nervosa is also characterised by these two features.

Bulimia and Binge Eating Disorder – Commonalities, Treatment, and Empirical Support.

Theories and models that suggest commonalities between bulimia and binge eating disorder. The Transdiagnostic Model posits that all eating disorders share the same distinctive psychopathology and have common mechanisms (over-evaluation and control of eating, shape, and weight) that maintain them (Fairburn, Cooper & Shafran, 2003). Psychoanalytic models have also suggested that all eating disorders are on a continuum. The common contributors to the development of any eating disorder are seen as being a confluence of factors including: cultural stressors; family dynamics that encourage caretaking and perfectionism; and the accumulated stress of deprivation in emotional nurturance that is enacted via a relationship with food (Bloom & Kogel, 1994). The subjugation of the body in eating disorders is also seen as an attempt to subjugate one's needy self due to experience in a family environment where needs were not met (Sands, 2003).

Developmental models assume that the infants' regulatory systems are modulated by the mother or caregivers more developed and differentiated nervous system (Schoore, 2001). The sensitivity of the caregiver in responding to the infants signals help to regulate the infants system including the regulation of appetite, and the ability to process emotions and adjust their intensity (Bowlby, 1969; Sroufe et al, 1999). It is suggested that if the

mother is preoccupied or distressed especially while feeding, she may be unresponsive to the infant's needs and signals. She may give conflicting or confusing messages in attachment responses, leaving the infant to experience fluctuating states of hyperarousal as needs are frequently misread, inconsistently gratified, and disorganising emotions are not regulated (Main, 2000). Therefore the relationship to food and eating is associated with hyperarousal or anxiety, and the dysregulation of emotions which is found in both BN and BED (Kullman, 2007; Vervaet, Heeringen, & Audenaert, 2004).

As these disorders appear to share a number of foundational predisposing and maintaining factors and these theories suggest that there are enough commonalities between all eating disorder diagnoses for BED and BN to be considered as sufficiently similar, they will be combined and examined as the same clinical group.

Treatments for bulimia nervosa and binge eating disorder based on emotion regulation or impulsivity. While there are an increasing number of models of bulimia nervosa that incorporate emotion dysregulation or impulsivity (Claes, Vandereycken, & Vertommen, 2005; Reindl, 2001), empirical investigations of these models has lagged behind (Fischer, Anderson, & Smith, 2004). While impulsivity has been implicated in the maintenance of bulimia, few therapies have specifically addressed this feature of bulimic or BED pathology. As any eating disorder with a binge component has been described as an impulse control disorder (ICD), and individuals with BED have been found to have greater impulsivity than controls, BED would also be considered to have difficulties with impulsivity (McElroy & Kotwal, 2006). It is surprising that impulsivity has not been specifically targeted in treatment considering that results consistently show that highly

impulsive bulimics have poor response to current interventions such as cognitive behaviour therapy (Keel & Mitchell, 1997).

Cognitive behavioural treatments. Cognitive behaviour therapy (CBT) has generally been the treatment of choice for bulimia nervosa and BED. Self-help manuals based on CBT for individuals with BED have been found to be effective in treating the associated psychopathology but not in reducing weight or binge eating (Wonderlich, et al., 2003). Later research comparing self-help and therapist led CBT treatments found that 51.7% of therapist led treatment groups abstained from binge eating while only 17% of self-help treatment groups abstained (Peterson, Miller, Crow, Thuras, & Mitchell, 2009). Most research shows that after completing CBT, approximately 50% of participants continue to binge and purge (Safer, Telch, & Agras, 2001) and less than 25% of individuals make full recovery (Fairburn, Cooper, & Shafran, 2003). Others report that CBT interventions have produced no significant differences pre to post or at 6-month follow-up on binge-purge behaviour, anxiety, or depression. Analyses of clinical significance have revealed that participants who evidenced clinically significant change in bulimic behaviour ranged from only 0% - 3% with poorer treatment outcomes for group compared to individual treatment (Chen et al., 2003; Openshaw, Waller & Sperlinger, 2004).

It is suggested that the reason for limited treatment response is that these interventions target areas such as relaxing dietary restraint, which may be of peripheral importance to the maintenance of the impulsive bingers' behaviours. The impulsive bulimic may require special components aimed at heightening abilities to anticipate and inhibit binge/purge episodes (Kotler, Boudreau, & Devlin, 2003). Recent guidelines from

two influential bodies – the American Psychiatric Association (APA) and the United Kingdom’s National Institute for Clinical Excellence (NICE), have suggested that trait-oriented interventions targeting personality-linked components like affective instability and impulsivity may optimise treatment effects (Bruce & Steiger, 2005; Peterson, Miller, Crow, Thuras, & Mitchell, 2005).

Dialectical Behaviour Therapy. Emerging therapies such as dialectical behaviour therapy (DBT) address core aspects of personality functioning by targeting skills that help to regulate traits that lead to maladaptive behaviours. Through targeting self- and emotion-regulation skills using mindfulness, emotion regulation, and distress tolerance strategies, DBT is thought to also influence impulsivity (Steiger, Lehoux, & Gauvin, 1999).

Although DBT was originally developed for borderline personality disorder, it has recently been adapted for people with binge eating disorder and bulimia nervosa as these eating disorders are thought to occur in the context of negative, unwanted affect (Kotler, Boudreau, & Devlin, 2003). The primary hypothesis underlying the use of DBT for bulimia and binge eating disorder is that individuals who binge eat have difficulty regulating negative emotions and are prone to binge eat to ameliorate distress (Wiser & Telch, 1999). The affect regulation model of bulimia has received considerable support and DBT as an intervention is proving a promising alternative to CBT (Kotler, Boudreas, & Devlin, 2003).

In a controlled trial of DBT versus wait-list control, 31 women (25 meeting full bulimia nervosa criteria; 6 eating disorder not otherwise specified) received twenty 50-minute individual sessions specifically aimed at teaching emotion regulation skills to

reduce rates of bingeing and purging. Significant treatment effects were found in an intent-to-treat analysis for frequency of binge eating and purging. Significant treatment effects for secondary measures were found, including all subscales of the Emotional Eating Scale and the negative affect subscale of the Positive and Negative Affect Schedule. The results indicate that treatment targeting emotion regulation skills can significantly decrease bingeing and purging. DBT is theorised to work by decreasing the individual's vulnerability to negative emotions associated with the urge to binge which indirectly affects areas such as impulsivity. This study reported a dropout rate of 0%, which suggests that DBT is deemed acceptable by participants (Safer, Telch, & Agras, 2001).

In a study of DBT for comorbid borderline personality disorder and eating disorders, seven women (five meeting full criteria for bulimia nervosa), received from six to 18 months of weekly one hour individual and one hour group sessions. On completion of treatment, and at six month follow-up, no participants met the full criteria for an eating disorder, although four met partial criteria for eating disorder not otherwise specified. There was no control group for this study, sample size was small and treatment length was inconsistent for all participants. The intervention was further complicated by the comorbid borderline personality disorder. However, results suggested that there is promise in utilising DBT and emotion regulation skills training for people with eating disorders. There were no dropouts in this treatment (Palmer, et al., 2002).

In an uncontrolled study of DBT for BED, 11 women received 20 group sessions of two hours duration adapted from Linehan's manuals for DBT (Linehan, 1993; Telch, Agras, & Linehan, 2000). Improvement in emotion regulation was noted with effect sizes

in the moderate to large range. Approximately 80% of the women were no longer binge eating at post-treatment which was maintained at three and six month follow-up. There were no dropouts (Telch, Agras, & Linehan, 2000).

While a promising intervention, DBT is both expensive and demanding (Palmer, et al., 2002). Although adaptations of DBT for people with eating disorders have reduced treatment from 18 months to 20 weeks, sessions are still delivered in individual rather than group format which increases cost and makes treatment less accessible to sufferers. DBT incorporates a large component of mindfulness skills in the treatment as a means of developing emotion regulation skills, distress tolerance, and reducing impulsive urges (Linehan, 1993). As mindfulness is such a central feature in DBT, and DBT is demonstrating very promising results in the treatment of eating disorders, it would make sense to more closely investigate mindfulness interventions with bulimia nervosa and binge eating disorder. Mindfulness interventions can be delivered in group format and are generally of an eight-week duration, making them far less demanding and intensive compared to DBT. Mindfulness interventions have been suggested as being the most appropriate treatment for binge eating disorders (Mobbs, Ghisletta, & Van der Linden, 2008).

So what is mindfulness and how could it be useful in addressing the core issues of bulimia and binge eating disorder - in particular emotion dysregulation and impulsivity?

Chapter 4

Mindfulness

What is Mindfulness?

Mindfulness is defined as “paying attention, on purpose to one’s own mental and physical processes during everyday tasks to act with clarity and insight” (Varela, Thompson, & Rosch, 1991, p.22) or as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p.4). It involves observation of internal and external stimuli as they arise (Baer, 2003) and is described as a state of mind that permits presence, reflection and insight (Epstein, 2003). It is proposed to be an alternative means for stress relief, personal empowerment/sense of perceived control, a heightened ability to resist impulsive urges, and deconditioning habitual responses (Kristeller & Hallett, 1999).

Traditionally, mindfulness is believed to be the moment of pure awareness prior to conceptualising what is occurring around us. Mindfulness has also been defined as: ‘mirror-thought’ (reflecting precisely and only what is currently occurring without condemnation or judgement), bare attention (effortless and detached attention), impartial watchfulness, and non-conceptual awareness. With mindfulness, there is no involvement with thoughts or concepts, ideas, opinions, or memories. Experience is registered but not compared, labelled, categorised, or engaged in, and there are no preconceived ideas of what may happen. It is a fluid, unbiased observation of what is currently occurring and how it is changing. This attendance to an unbiased reality is considered the ultimate in mental health, leaving the individual free from psychological and emotional irritants, with complete acceptance of self (Mahathera, 1990).

The word mindfulness can be used to describe a theoretical construct, the practice of cultivating mindfulness, and the psychological process of being mindful (Germer, 2005). Bishop et al. (2004), consider mindfulness to be a process of increasing awareness and developing means of responding to mental processes that contribute to emotional distress and maladaptive behaviour, therefore making mindfulness a tool for self-regulation and emotion management (Bishop, 2002).

Bishop et al. (2004) proposed a two-component model of mindfulness. The first component involves the self-regulation of attention, so that immediate experience is the focus of attention. Self-regulation of attention involves both awareness and attention. Awareness refers to the subjective experience of internal and external phenomena that encompass perceived reality at any one time. Attention refers to the focusing of awareness to select highlighted aspects of that reality (Brown & Ryan, 2004). Awareness is the non-judgemental, non-elaborative, non-ruminative observation of thoughts, emotions and sensations. Attention involves the ability to regulate the focus of observation from the changing field of thoughts, emotions, and experience to the breath or another chosen object (Bishop et al., 2004).

The second component to mindfulness involves an open, curious and accepting orientation towards one's present-moment experiences (Bishop et al., 2004). This component is also labelled as acceptance and is defined as being experientially open to the reality of the present moment (Roemer & Orsillo, 2002). It involves abandoning the agenda for experience to be other than what it is and is an active process of allowing current thoughts and emotions to be as they are (Hayes, Strosahl, & Wilson, 1999). Experience is approached with curiosity (beginner's mind; Kabat-Zinn, 1990) and non-

striving (relinquishing both expectations of, and striving toward, outcome goals; Baer, 2003).

It is suggested that all aspects of mindfulness must be experienced simultaneously to have a moment of mindfulness. These mindful moments are believed to share the following common properties: awareness without absorption in thought processes; present-centred focus; nonjudgement; intention to direct attention and awareness; investigation of subtle levels of perception; non-verbal experience of the moment (awareness occurs before thoughts arise in the mind); with the observer self also as participant in experience (Germer, 2005). For example, one may have an acute *awareness* of emotional distress (anxiety) but become absorbed in the accompanying thoughts (worry), and *intentionally* shift focus to bodily sensations (heart racing, shallow breathing) but with *judgement* (increased fear at physical symptoms) thereby creating more distress (Germer, 2005).

Mindfulness and the Relationship with Emotion Regulation

Mindfulness has been found to be positively correlated with measures reflecting emotional regulation, self-compassion and emotional intelligence, and inversely related to measures of alexithymia, dissociation, and experiential avoidance (Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006). It has been suggested that mindfulness has the potential to be used as an emotion regulation strategy (Roemer & Orsillo, 2003), and as a technique to reduce impulsive reactivity that might otherwise heighten emotional distress (Bishop et al., 2004).

In support of this, mindfulness appears to share common characteristics with the various facets of emotion dysregulation including emotional awareness, acceptance and

clarity, and may provide strategies to manage difficulties with impulse control and difficulties engaging in goal directed behaviours while distressed (Gratz & Roemer, 2004).

Emotional awareness, acceptance, and clarity. Mindfulness enhances self-reflection in a non-ruminative way, which may be beneficial for various reasons (Teasdale, Segal, & Williams., 1995). Increased contact with, and understanding of, inner experience is thought to facilitate better psychological functioning, and to decrease levels of experiential avoidance (Hayes & Shenk, 2004). This is then likely to result in a greater capacity to distinguish emotional arousal from unrelated bodily felt urges and sensations (Bishop, et al., 2004). Distraction from internal events is likely to be reduced, facilitating a greater capacity to tolerate distress, and less need for tension reducing behaviours such as bingeing and purging (Vervae, Heeringen, & Audenaert, 2004). Emotional distress is likely to be experienced as less threatening since the context of acceptance changes the subjective meaning of the distress, likely leading to improved emotion regulation (Bishop, et al., 2004; Kabat-Zinn, 1990; Linehan, 1993). Therefore, through attention to inner experience, and acceptance and tolerance of internal events, mindfulness may facilitate a greater capacity for emotion regulation and a more coherent sense of self, which in turn, may reduce the likelihood of engaging in impulsive behaviours to alleviate distress.

This may be particularly useful for individuals with high intensity emotional responses, slow rates of negative emotion decay and/or limited internal coherence where internal events may be more difficult to tolerate. With greater clarity, acceptance and tolerance of internal events, the individual is less likely to engage in elaboration of

emotional distress, leaving more resources available for employing emotion regulation strategies (Schulman, Augustine, & Hemenover, 2006). When emotion states are stripped of all extraneous detail and observed without interpretation, they are less likely to increase in intensity and become intolerable. When these states are experienced as tolerable, it is less likely that there will be the felt urgency to engage in some type of action or impulsive activity to relieve the distress (Fairburn, 2002; Linehan, 1993).

Acting in accordance with desired goals, and impulse control. Mindfulness is hypothesised to facilitate adaptive, flexible responding to events rather than rigid, rule-governed patterns of responding (Hayes, Strosahl, & Wilson, 1999), providing the individual with a range of strategies that allow them to continue to act in accordance with desired goals despite emotional distress (Gratz & Roemer, 2004). Mindfulness may improve the individual's ability to tolerate emotional distress through increasing the ability to have both focused attention and increased capacity for concentration on multiple aspects of experience (Germer, 2005). This may improve the individual's ability to respond flexibly while emotionally distressed via being able to encompass all aspects of experience to derive solutions, as well as increasing the likelihood that the individual will be able to act in ways that are concordant with their values and interests (Brown & Ryan, 2003). This may also assist with some of the behavioural aspects of impulsivity where impulsive individuals tend to have difficulties delaying gratification and managing behaviours that may be damaging to self (Barratt, 1993; Buss & Plomin 1975). Additionally, greater focused attention and concentration may improve some of the cognitive aspects of impulsivity where the impulsive individual may have difficulty with

sustained attention and boredom susceptibility (Hollander, Baker, Kahn, & Stein, 2006; Rosval et al, 2006).

Mindfulness, Emotion Regulation, and Attachment Theory. The capacity to regulate emotions has also been proposed to develop via early secure attachment relationships (Diamond & Aspinwall, 2003). It may therefore be possible that early relationship experiences may contribute to the inherent level of mindfulness an individual possesses. Recently attachment theorists have proposed a connection between attachment experiences and the development of cognitive and emotional abilities that are consistent with theories of mindfulness (Fonagy, Gergeley, Jurist, & Target, 2002; Wallin, 2007).

Secure attachment is associated with an ability to ‘mentalise’ or to take a reflective stance toward experience (Fonagy, Gergeley, Jurist, & Target, 2002). This reflective stance is similar to the observer self or decentred stance described in the mindfulness literature (Shapiro, Carlson, Astin & Freedman, 2006). It involves stepping back from the immediacy of the experience and taking a metacognitive view of the mental states underlying experience, preventing cognitive elaboration and allowing the individual to reflect on the meaning of experience without being reactive to it (Wallin, 2007). Mindfulness, as already described, provides the platform for this metacognitive, reflective stance. Mindfulness and mentalising are considered similar in that they both assist the individual to recognise that mental states are subjective, fluid, and are something the individual *has* rather something they *are*. They both contribute to emotion regulation, empathy, and interpersonal trust. Finally, they both enhance a reflective stance and provide access to an internal observer. Mindfulness is considered to differ from

mentalising in terms of taking not only a reflective stance towards experience but also being fully present to experience (Wallin, 2007).

The regular practice of mindfulness has been found to be associated with similar outcomes as those of individuals who have had childhood histories of secure attachment, namely bodily and affective self-regulation, attuned communication with others, insight, and empathy (Siegel, 2005, 2006). It has been suggested that mindfulness and secure attachment both generate an internalised secure base but through different routes and experiences. Secure attachment relationships in childhood provide recognition, non-judgemental understanding, care, and soothing that can later be internalised. Mindfulness may develop this reassuring internal presence via providing awareness of self from a non-judgemental stance, an openness and acceptance of experience, and the development of the ability to self-soothe (Shaver, Lavy, Saron, & Mikulincer, 2007; Wallin, 2007).

Secure individuals are described as having integrated models of attachment that foster flexibility and ease of access to attachment related information when threatened or challenged. Insecure individuals tend to have multiple or conflicting and incompatible models of attachment that require a defensive narrowing of attention in order to deal with threatening thoughts and feelings. This undermines the ability of the insecure individual to step back and reflect on their own experience (Wallin, 2007). This would also leave the individual with limited resources to regulate emotions and engage in behaviours that may minimise the distress (Schulman, Augustine, & Hemenover, 2006). Mindfulness encourages a broadening of awareness to all aspects of experience, as well as non-reactive self-reflection that fosters a similar flexibility to integrated models of attachment which in turn should improve emotion regulation (Wallin, 2007).

In addition to the cognitive and emotion regulation qualities that both mindfulness and secure attachment provide, they may both allow body felt sensation to guide and regulate experience. According to Attachment Theory the original sense of self is embedded in somatic experience. The quality of the attachment relationship and the ongoing proximity of the attachment figure influence the body's responsiveness providing securely attached infants with a higher threshold for the activation of physiological stress response than insecurely attached infants (Polan & Hofer, 1999). The attachment figure's responsiveness to the child's somatic experience can provide the child with the ability to allow bodily sensation to inform, direct, and enrich the self. Alternatively, unresponsiveness can leave the individual susceptible to denying, dissociating from, or distorting bodily experience, and can sometimes result in the individual exploiting or attacking their body for a variety of psychological purposes (Wallin, 2007). For example, denial, dissociation from, or distortion of bodily experience may result in an individual having little or no interoceptive awareness, in binge eating, or engaging in deliberate self-harm (Mikulincer & Sheffi, 2000). Mindfulness may provide an alternative route to the utilisation of body sensation for self-related information through developing awareness of physical sensation while maintaining a non-reactive stance (Bishop et al., 2004; Mahathera, 1990).

Mindfulness may operate like the internal secure base developed from secure attachment relationships (Shaver, Lavy, Saron, & Mikulincer, 2007). While mindfulness may be more likely to be inherently present for those with a history of secure attachment, the development of mindfulness may provide some of the benefits that having a secure base could supply e.g. the internalisation of an accepting and non-judgemental attitude

towards the self; greater emotional and cognitive flexibility; better general functioning; less depression and anxiety; greater interoceptive awareness; a more coherent sense of self; less susceptibility to distortions of self-worth (e.g. poor body image); and greater ability to resist impulsive urges (Flores, 2004; Johnson, Maddeaux, & Blomin, 1998; Mikulincer, Shaver, & Pereg, 2003; Polan & Hofer, 1999; Shaver, Lavy, Saron, & Mikulincer, 2007; Ward, Ramsay, & Treasure, 2000).

Many of these outcomes have been examined in the recent proliferation of research into mindfulness-based interventions. The following review incorporates studies with outcomes that relate to emotion regulation, or impulsivity, and/or the outcomes proposed by attachment theory.

Empirical support for the use of mindfulness-based interventions to improve emotion dysregulation, impulsivity, and attachment-related outcomes. Mindfulness-based interventions are consistently associated with improvements on a range of psychological and physiological outcome variables. Sample populations have included chronic pain patients (Kabat-Zinn, Lipworth, & Burney., 1985), individuals with diagnosed Axis I disorders (Teasdale, et al., 2000), individuals with medical complaints such as cancer (Specia, et al., 2000); non-clinical populations such as nurses (Cohen-Katz et al., 2005); and college students (Astin, 1997). Meta-analyses of recent research found mean effect sizes of .49 for controlled studies (Grossman, Niemann, Schmidt, & Walach, 2004), and mean post-treatment and follow-up effect sizes of .59 (Baer, 2003). The first meta-analysis included 64 Mindfulness-Based Stress reduction studies (Grossman, et al., 2004) which covered a range of clinical (e.g. depression, anxiety, pain, cancer, heart disease) and stressed non-clinical populations. Studies were excluded if there was

insufficient information about the interventions, if they deviated too much from health related MBSR programs, or if statistical analyses were inadequate. Both controlled and uncontrolled studies showed similar effect sizes of .05 ($p < .0001$) with homogeneity of distribution (Grossman, et al., 2004).

The second meta-analysis included 21 interventions where there was a group of participants trained in mindfulness compared to a group who were not. Studies were excluded if they deviated from traditional conceptualisations of mindfulness or if mindfulness was not assessed separately (as in Dialectical Behavior Therapy). Sample sizes ranged from 16 to 142 participants. Post-treatment effect sizes ranged from .15 to 1.65 with the overall effect size .59 (Baer, 2003) indicating that mindfulness is a promising intervention for a range of disorders.

Findings from a number of specific studies providing evidence of the effectiveness of mindfulness in assisting with emotional regulation are presented below, including studies comparing groups, (Nielsen & Kaszniak, 2006; Weiss, Nordie, & Seigel, 2005), study comparing pre-post treatment (Davidson, et al., 2003), and a number of studies illustrating associations between mindfulness and various aspects of emotion dysregulation including experiential avoidance, psychological distress, and mood difficulties (Arch & Craske, 2006; Carlson, Speca, Patel, & Goodey., 2003; Coffey & Hartman, 2008; Cohen-Katz et al., 2005; Hayes & Feldman, 2004; Roth & Robbins, 2004; Speca, Carlson, Goodey, & Angen, 2000).

Mindfulness and emotion regulation. In a comparison study with 11 long-term meditators (from 4 – 29 years meditation experience in the Buddhist tradition) and 17 non-meditators, it was found that meditators had better access to emotion regulation

strategies and reported greater emotional clarity as measured by the Trait Meta-Mood scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). It was also found that meditators were less reactive than non-meditators to both pleasant and unpleasant stimuli. Researchers interpreted these findings as indicating that meditators were more equanimous, and had developed emotion regulation strategies that allowed them to observe and let go of emotional experiences without engaging in cognitive elaboration, which reduces arousal, enhances positive affect, and decreases engagement in unnecessary and unpleasant feeling states. It was also found that the more years of meditation experience, the greater the emotional clarity, the less reactive to emotional stimuli, and the more emotion regulatory skill (Nielsen & Kaszniak, 2006).

In a study comparing individuals attending a Mindfulness Based Stress Reduction group (MBSR; Kabat-Zinn, 1990) as an adjunct to psychotherapy with individuals receiving psychotherapy alone, it was found that psychotherapy plus MBSR resulted in significantly greater reductions in psychological distress. The researchers suggested that mindfulness training may increase coping abilities, the sense of agency and self-directedness of the individual which contribute to more effective emotion regulation (Weiss, Nordie, & Seigel, 2005).

In a study measuring 25 participants' brain electrical activity and immune functioning pre and post MBSR, it was found that left hemisphere activation increased and the magnitude of this increase predicted improved immune function. Left hemisphere activation is associated with positive phasic emotion and with more dispositional positive affect. It is also associated with more adaptive responding to negative and/or stressful events. These results indicate that the prefrontal activation asymmetries can be shaped by

mindfulness training to produce increases in positive and decreases in negative affect which would therefore improve emotion regulation (Davidson, et al., 2003).

In a review of validation studies for the Cognitive Affective Mindfulness scale (CAMS; Hayes & Feldman, 2004) it was found higher scores on mindfulness were associated with less experiential avoidance, thought suppression, rumination, worry, obsessions, recurrent cravings, and spread of activation from a negative event to a negative sense of self (elaboration) which have all been associated with poor emotion regulation. Mindfulness was also found to be associated with more clarity of feeling, perceived ability to repair one's mood, and low scores on depression and anxiety (Hayes & Feldman, 2004).

A study of university students completing self-report measures of mindfulness, emotion regulation, rumination, and psychological distress found that increased mindfulness was associated with an increase in ability to regulate emotions, decreased rumination, and less psychological distress. In particular, it was found that emotion regulation skills and level of rumination had a direct effect on depression and anxiety symptoms while the non-attachment facet of mindfulness reduced rumination and was directly associated with decreased psychological distress (Coffey & Hartman, 2008).

Further studies have supported the relationship between mindfulness and aspects of emotion regulation. For example, in an experimental study, participants who practiced mindful breathing reported experiencing less negative affect (Arch & Craske, 2006). At the completion of an 8 week MBSR program for cancer outpatients, there were significant improvements to emotional irritability (Carlson, Speca, Patel, & Goodey., 2003). These results were supported by another study with 90 cancer patients who

completed a mindfulness-based intervention (Specia, Carlson, Goodey, & Angen, 2000). Participants reported significant reductions in emotional irritability, depression, cognitive disorganisation, and habitual patterns of response to stress. A study using MBSR for nurses with burnout indicated that among measures of burnout there were significant reductions in emotional exhaustion, indicating that mindfulness may provide a means of repairing emotional distress (Cohen-Katz et al., 2005). Findings from a mixed diagnostic group that completed MBSR revealed that among improvements to symptoms of mental health diagnoses participants also reported having less interference from psychological or emotional problems (Roth & Robbins, 2004).

In summary, studies looking at mindfulness and emotion dysregulation have found that increasing mindfulness reduces emotion dysregulation, psychological distress, and mood disturbance, as well cognitive aspects related to emotion dysregulation such as rumination, worry, cognitive elaboration, and cognitive disorganisation.

Mindfulness and impulsivity. Mindfulness-based interventions have been applied to disorders where difficulty with impulse control is a central feature such as alcohol and substance use (Marlatt & Kristeller, 1999). Mindfulness is proposed to serve as an alternative to addictions by increasing awareness of the initial cravings, and producing a relaxation response that replaces the positive and negative reinforcement previously associated with the addictive behaviour (Witkiewitz, Marlatt, & Walker, 2005). Mindfulness may therefore increase awareness of urges to binge and provide an alternative to the reinforcing effects of the binge/purge cycle. In a study comparing a mindfulness group to treatment as usual (TAU) control group in a prison setting, significant reductions in drug use and alcohol related problems and psychiatric symptoms

were found for the mindfulness, but not the TAU group (Bowen et al., 2006) indicating a greater ability by mindfulness participants to manage impulsivity, tolerate craving and reduce distress.

Mindfulness and attachment research. In a randomised controlled trial of 70 participants of a 3-month meditation retreat, it was found that attachment orientation based on the anxiety/avoidance dimensions accounted for 46% of the variance in mindfulness as measured by the Five Factor Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006). Each dimension was significantly and uniquely related to mindfulness in different ways with individuals with an anxious attachment orientation being more reactive to inner experience, more judgemental of experience and less aware. Individuals with an avoidant orientation had difficulty with these facets of mindfulness as well as the facets labelling, observing, and noticing. Results were correlational so were unable to ascertain whether mindfulness was an outcome of secure attachment or if it preceded it. However, it has been suggested that the relationship between mindfulness and attachment security may be bi-directional (Shaver, Lavy, Saron, & Mikulincer, 2007).

As can be seen from this review of research, mindfulness shows promise as an intervention for addressing many of the aspects related to emotion dysregulation, impulsivity, and outcomes related to poor attachment orientations. As mentioned previously, difficulties with emotion regulation, impulsivity, and insecure attachments have been found to be characteristics of individuals with eating disorders such as bulimia nervosa and binge eating disorder. As mindfulness has been shown to be effective in addressing many of the symptoms and deficits in functioning of these difficulties, it

makes sense that mindfulness may also address some of the difficulties associated specifically with these eating disorders. The following section first provides a rationale for the use of mindfulness in the treatment of eating disorders with a binge component and then reviews the relevant literature.

Mindfulness, emotion dysregulation, impulsivity, and eating disorder symptoms.

Individuals with bulimia tend to feel disconnected from their bodies and emotions, and have reduced interoceptive awareness. Mindfulness serves to increase awareness of physical and affective states, re-regulating the balance of the autonomic nervous system and providing a link to physiological processes that can be directly experienced and that are acceptance based and non-threatening (Kristeller, 2003; Roemer & Orsillo, 2003). Mindfulness increases awareness of interoceptive cues, increasing the individuals' awareness of hunger and satiety cues which individuals with bulimia and binge eating disorder seem to be particularly disengaged from. Mindfulness may also provide the means for re-regulation of the emotional value of eating. Emotional associations to food are powerfully conditioned, and mindfulness may allow for gentle and effective disengagement rather than imposing strict rules (Kristeller, 2003).

Awareness to, and acceptance of, the present moment may be beneficial in decreasing perfectionistic standards (Cohen-Katz et al, 2005). Body image disturbances may be undermined through the ability to experience the moment and the self or body as it is without wanting or attempting to change it. Acceptance of bulimic or binge eating symptoms as they currently operate may paradoxically reduce behaviours as the struggle and identification with symptoms may be reduced. Present moment awareness may help reduce dissociative experiences that have been found to be co-morbid with bulimic

behaviour (Corrigan, 2002). Binge episodes particularly have been described as occurring in a dream-like or dissociative state (Klaymen Farber, 2000). Continued training in maintaining present-moment awareness may improve the tolerance for the triggering situation and may provide an alternative to ‘mindless’ eating (Kristeller, 2003).

Finally, it is believed that inadequate self-structure can be repaired through the therapeutic or group relationship if it has not been available from early attachment figures (Flores, 2001). Therefore the group format of the mindfulness intervention would likely be influential on repairing some attachment deficits. It has been suggested that groups can develop into a secure base that enables participants to begin to shift their objects of attachment from the eating disorder to the group and its members (Walant, 1995).

As can be seen, there is a solid rationale for using mindfulness to address emotion regulation deficits, impulsivity, and bingeing and purging. Additional maintaining mechanisms for bulimia nervosa suggested by cognitive models may also be alleviated with mindfulness practice.

Mindfulness and the maintaining mechanisms of bulimia and binge eating disorder from a CBT perspective. Low self-esteem, extreme concerns about weight and shape, strict dieting, bingeing and purging comprise the five main elements in the cognitive model of bulimia. The cognitive model places overvaluation of weight and shape based on cultural pressure for thinness, and extreme dietary restriction as the core maintaining features of bulimia (Wilson, Fairburn, Agras, Walsh & Kraemer, 2002). In addressing these features, mindfulness encourages acceptance of current weight and shape. Forming a decentred attitude through mindfulness training encourages observation of the impact of cultural and social values on personal judgements. Social pressure to be

thin may be observed as a set of values extrinsic to the self that do not necessarily define identity. Identification with bulimic behaviours and cultural values on body image may be more readily relinquished (Shapiro, Carlson, Astin, & Freedman, 2006).

The non-judgement component of mindfulness may reduce the dichotomous thinking inherent in the labelling of food as being ‘bad’ or ‘good’ (Baer, Fischer, & Huss, 2006). Curiosity or beginner’s mind encourages food to be appreciated on numerous levels e.g. focussed attention on taste and aroma, curiosity about the origins of the food, and the process it experienced to reach its current state (Kabatnick, 1998). This may also help to reduce the emotional value attached to eating. Non-striving may eliminate the goal-directedness of weight loss and the aim for the perfect body.

Acceptance and awareness of emotions is likely to result in an ability to generate differentiated and integrated representations of affective experience (Bishop, et al., 2004), a skill lacking in a significant proportion of bulimic and binge eating women (Sim & Zeeman, 2004). The ability to maintain an accepting attitude in the face of triggers such as negative affect weakens the association between triggers and behaviours, preventing the path from heightened distress to the urge to binge (Breslin, Zack, & McMain, 2002).

Mindfulness also prevents elaboration of emotional and cognitive events, which is thought to increase the severity of the emotions to be tolerated (Bishop, et al., 2004; Kabat-Zinn, 1990). Through observation of emotional and cognitive events as they occur, without secondary thought *about* them, increased ability to recognise impulses to binge may be recognised and not acted upon (Kristeller & Hallett, 1999). Freeing the limited capacity of attention through non-elaboration allows for more resources to be available to process information related to the current experience (Baer, 2003). This may also be

effective for other impulsive behaviours that are comorbid with bulimia (e.g. substance abuse, self-harm). Through practice, instances of over-engagement, elaboration and avoidance are noticed and decreased (Hayes & Feldman, 2004).

Mindfulness may also foster improved self-acceptance and sense of control (Kristeller & Hallett, 1999). Mindfulness encompasses the paradox that acceptance and non-striving leads to desired effects. Non-striving allows the individual to relinquish goals and to let things *be*. As a result, there is no striving to change *irrational* thoughts or *bad* eating behaviour, eliminating the sense that there is something inherently wrong with the individual (Baer, 2003). This also prevents cognitive and emotional elaboration, which can lead to anxiety and depression (Kabat-Zinn, et al., 1992; Teasdale, Segal, & Williams, 1995), both of which have been associated with bulimia and binge eating (Milligan & Waller, 2000; Tasca, Balfour, Kurichh, Potvin-Kent, & Bissada, 2006).

Mindfulness facilitates a shift in perspective where contents of consciousness previously seen as *subject* become *object*. A decentred perspective is promoted, facilitating the notion of being *more than* what is being observed, and reducing identification with unpleasant or distressing experiences. Events may be experienced as more tolerable and controllable (Shapiro, Carlson, Astin & Freedman, 2006). From a decentred perspective, an eating disordered woman may begin to perceive herself as more than her weight and body shape, with a greater ability to tolerate triggers to bingeing and purging rather than over-identifying with these behaviours and self-evaluations.

Although not a particular focus of mindfulness, practice has been found to increase relaxation and reduce stress (Baer, 2003). Reducing stress and stress reactivity may be helpful in reducing the intensity of the emotions experienced and the reaction to

cues that may previously have been triggers to bulimic behaviours (Kristeller & Hallett, 1999). Mindfulness is hypothesised to lead to improvements in self-esteem through reducing both judgement and non-acceptance of self (Olendzki, 2005). It is considered to be more effective than CBT in changing biased information processing regarding body image self-evaluation, and weight and shape concerns (Stewart, 2004). Rather than judgementally identifying and challenging irrational beliefs, assumptions, and cognitive distortions, mindfulness allows change through observation, acceptance and non-elaboration of the original self-evaluation (Stewart, 2004).

While CBT treatment is aimed at reducing these core symptoms, few studies have evaluated treatment on these core processes and even fewer report significant pre to post decreases in dietary restraint, extreme concern with body weight and shape, or self-esteem. Outcome variables are most often binge and purge behaviours (Anderson & Maloney, 2001). As CBT treatment does not seem effective in reducing these core processes in the maintenance of bulimia, mindfulness may be an appropriate alternative.

Research supporting mindfulness interventions for binge eating disorder and bulimia nervosa.

There have been a few studies providing promising findings of the effectiveness of mindfulness interventions with eating disorders. Mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasedale, 2002) has recently been adapted to binge eating disorder (BED: Baer, Fischer, & Huss, 2006). MBCT emphasises intensive mindfulness practice but includes cognitive exercises such as recognising automatic thoughts. Minor changes to the original MBCT program included adding two sessions (10 in total) to allow comparison to a cognitive-behavioural protocol, and substituting material specific

to binge eating. Participants were 10 women, 23 to 65 years old, six of which met full DSM-IV criteria for BED. Six participants completed treatment. From pre-to-post treatment objective binges decreased. Subjective binges increased, but it was determined that this indicated greater interoceptive awareness. Pre- to post-treatment effect sizes for outcome variables demonstrated mixed results. Eating restraint, shape concern, and expectancy of eating to manage negative affect had medium effect sizes indicating moderate therapeutic change. Concern with eating improved substantially with a large effect size of .96. Increases in mindfulness, particularly non-judgemental acceptance were large ($d=1.58$). These results indicate that mindfulness training may be effective in improving eating disorder symptoms such as frequency of binges, concerns related to body image and dissatisfaction, and issues of control, all of which have been associated with bulimia nervosa.

The study was limited by small sample size, and lack of comparison group. One facilitator had no mindfulness experience, and the treatment incorporated CBT exercises. It is still unclear whether the mindfulness training or cognitive aspects of this treatment were mechanisms of change. However, as the majority of the program was dedicated to teaching mindfulness skills, it is reasonable to assume that increasing mindfulness skills may reduce eating disorder symptoms.

In an uncontrolled study using group delivered mindfulness for binge eating disorder (mindfulness-based eating awareness training: MB-EAT; Kristeller & Hallett, 1999), 21 women participated (18 completed) in seven sessions over six weeks. All met full DSM-IV criteria for BED. MB-EAT is a 9-session group intervention that includes several types of mindfulness and guided meditation exercises. Focus is on awareness and

acceptance of bodily sensations, mindful eating of foods typically involved in binges, and emotions associated with eating. Weekly binges decreased on average from 4 to 1.5, with only 4 participants meeting full BED criteria post-treatment. Measures of depression and anxiety decreased from clinical to subclinical levels, and interoceptive awareness increased significantly from pre to post treatment. Feelings of anger towards others were resolved substantially, which participants had identified as triggers for binges. Increases in mindfulness were associated with decreases in the number of binges (Kristeller & Hallett, 1999). This study was limited by lack of control group but demonstrated promising results for this treatment, which is both time limited and delivered in group format. Results also suggested that changes in mood and behaviour were mainly attributable to the meditation practice. However, as MB-EAT includes both mindfulness and guided food-related meditations, it is unclear which was responsible for improvements.

Aims and Rationale for the Current Research

As can be seen from the above examples, mindfulness interventions appear promising for addressing the symptoms of eating disorders with a binge component, improving emotion regulation and addressing secondary issues associated with these disorders i.e. impulsivity, mood disturbance, and general dysfunction. Some of the mindfulness research has examined emotion regulation, impulsivity, mood disturbance, and general dysfunction either as secondary or primary measures but the relationships these variables share with mindfulness has not been examined in a group of women who meet the criteria for bulimia nervosa. Furthermore, while individuals with bulimia nervosa and binge eating disorder tend to report difficulties with emotion regulation,

impulsivity, mood disturbance, and general dysfunction, the relationships between combinations of these variables has not been explored in an eating disordered population. It has been suggested that further investigation of the relationships between emotion regulation, impulsivity and binge eating disorders is warranted (Stratton, 2006). Additionally, despite the theorised role that attachment orientation plays in emotion dysregulation, mindfulness, mood disturbance and general dysfunction, and secondary attachment behaviours (i.e. impulsivity and eating disorders), these relationships have not been previously examined. Examining these relationships may provide further information on which to build more effective interventions. Examining the ability of a mindfulness intervention to impact on emotion dysregulation, impulsivity, eating disorder symptoms, mood problems and general dysfunction in an eating disordered population will contribute to the understanding of the strengths and limitations of mindfulness interventions for treating people with eating disorders, emotion dysregulation, and impulse control difficulties.

The first aim of Study 1 is to examine the relationships between the primary variables (emotion dysregulation, impulsivity, eating disorder symptoms, and mindfulness) and secondary variables (attachment orientation, general dysfunction and mood) in a non-clinical population. Impulsivity and emotion dysregulation are frequently comorbid in psychiatric conditions but have not been examined in a population who do not meet the criteria for a DSM-IV disorder. Emotion dysregulation and impulsivity are frequently associated with eating disorder symptoms (Claes, Vandereycken & Vertommen, 2005). Even though it is unlikely that many participants in a non-clinical population would meet the criteria for an eating disorder, it would still be expected that

cognitions and behaviours indicative of eating disorders would be positively related to emotion dysregulation, impulsivity, and insecure attachment style, and be negatively related to mindfulness. Mindfulness is theoretically the antithesis of emotion dysregulation and impulsivity (Bishop, 2002; Chambers, Gullone, & Allen, 2009) and should therefore be inversely related to both emotion dysregulation and impulsivity. As emotion dysregulation is believed to be an outcome of poor quality early attachment relationships, and attachment styles are found to be relatively stable over time (Mikulincer, Shaver, & Pereg, 2003; Scharfe, 2003), it would be expected that insecure attachment styles, on the one hand, and emotion dysregulation and impulsivity on the other hand, would be expected to show positive correlations and to be inversely related to mindfulness. Additionally, there are multiple measures of emotion regulation that may tap different aspects of emotion regulation but may not provide unique information. A further aim of Study 1 is to determine the most comprehensive emotion regulation measure. The aim of Study 2a is to examine these same relationships in a clinical population. Although direct comparisons cannot be made between samples as they were not matched on relevant characteristics, the direction of associations and unique relationships will be considered for each sample and contrasted. Differences in patterns of associations will be further examined for correlations between subscales of emotion dysregulation, mindfulness and eating disorder symptoms.

The aim of Study 2b is to examine the impact of an 8-week mindfulness intervention on emotion dysregulation, mindfulness, impulsivity, eating disorder symptoms, mood and general functioning variables with the clinical sample.

Chapter 5

Study 1: Emotion Dysregulation, Impulsivity, Mindfulness, Eating Disorder Symptoms, Mood, Attachment Orientation, and General Dysfunction in a Non-Clinical Population

Method

Participants

Participants were 199 university students who participated for partial credit in a first year psychology course. These participants were from a total of 224 who had completed the survey. Two participants were excluded due to excessive missing data and another 23 individuals were missing data on an entire scale and were removed from the analyses.

The age of participants ranged from 17 to 41 years ($M = 21$, $SD = 4.77$). Most were female (70.7%) and 28.4% were male, 0.9% did not indicate. Of the participants, 28% were in part-time or full-time employment. A small percentage (15.8%) had received psychological treatment with 11.5% having received a mental health diagnosis (mainly depression and anxiety, with two participants having diagnoses of bulimia nervosa and one anorexia nervosa).

Illegal or prescription drugs, including amphetamines, benzodiazepines, and hypnotics were used monthly or more frequently by 11.5% of participants. Of these 33.3% used drugs daily, 8.3% weekly and 16.7% monthly. Alcohol was consumed by 41.6% of participants monthly or less, 24.8% drank 2 – 4 times per month and 23.1% drank 2 – 4 times per week. There were 24.1% of participants who had previous

meditation experience with 11.6% having less than 1 year experience and 12.5% having greater than 1 year. Only 8.6% practiced meditation weekly or daily.

Measures

Participants completed a questionnaire that contained measures of primary variables (emotion regulation, impulsivity, mindfulness, and eating disorder symptoms) and secondary variables (mood, general dysfunction, attachment orientation, and alcohol and drug use). Missing values revealed that most items had less than 5% of data missing. Where participants missed some scale items, scale scores were computed from the valid items and pro-rated.

Emotion Regulation

The Difficulties in Emotion Regulation Scale. (DERS; Gratz & Roemer, 2004) is a recently developed, 36-item self-report measure tapping six domains of emotion regulation. In order to assess difficulties regulating emotions during times of distress, many items begin with “When I’m upset”. Participants are asked to indicate how often a response applies to them, with responses ranging from 1 *almost never (0-10%)* to 5 *almost always (91-100%)*. Items are summed to create total and subscale scores. Items and scales are reverse scored where necessary so that higher scores on each scale reflect greater difficulties in emotion regulation. Emphasis is placed on the control of behaviours when emotions are present rather than on the control of emotions themselves (Gratz & Gunderson, 2006). Difficulties are assessed in relation to the following six domains of emotion dysregulation: nonacceptance of emotion responses ($\alpha = .85$), difficulties engaging in goal-directed behaviour ($\alpha = .89$), impulse control difficulties ($\alpha = .86$), lack of emotional awareness ($\alpha = .80$), limited access to emotion regulation strategies ($\alpha =$

.88), and lack of emotional clarity ($\alpha = .84$) (Gratz & Roemer, 2004). In the current study Cronbach's alpha for the subscales were: .88 (nonacceptance), .60 (goals), .67 (impulse), .80 (aware), .76 (strategies), and .24 (clarity). Cronbach's α for the total scale is reported to be high at .93. Alpha for the total scale in the current study was .86. Four to eight week test-retest reliability is good at .88. Correlations between the overall DERS score and related constructs (e.g. Experiential Avoidance; Negative Mood Regulation; Emotional Expressivity) were in the expected directions and statistically significant. Additionally, partial correlations between the DERS total and subscale scores, and constructs of interest revealed that the DERS accounted for a significant amount of additional variance above and beyond that of other measures of emotion regulation. The DERS was able to significantly predict two behavioural outcomes believed to be associated with emotion dysregulation – deliberate self harm and partner abuse at the .01 level. Scores closer to the mean of a normative population (mean DERS among female college students = 77.99; Gratz & Roemer, 2004) than a clinical population is considered representative of normal functioning (Gratz, Lacroce, & Gunderson, 2006).

The Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). The TMMS is a 30- item Likert-type self-report measure that assesses individual differences in the ability to manage emotions. The TMMS was developed from research on reflective processes that accompany mood states and was initially developed as a measure of the cognitive components of emotional intelligence (Fitness & Curtis, 2005; Palmer, Gignac, Bates, & Stough, 2003). However, the TMMS has been described as measuring the individuals capacity to regulate and manage emotions as opposed to their actual level of emotional intelligence (Salovey, Bedell, Detweiler, & Mayer,

2000). There are three subscales of attention to feelings, clarity of feelings, and mood repair. Respondents rate how much they agree with each statement with responses from 1 (*strongly agree*) to 5 (*strongly disagree*). Items are summed to create subscale and total scores with higher scores reflecting greater ability to regulate emotions. The direction of scoring for all items on the 'attention' subscale are reversed for consistency. The TMMS demonstrates good internal consistency with Cronbach's α from the original sample at .86, .88, and .82 for attention, clarity, and repair respectively (Salovey, et al., 1995) and for an Australian sample .78, .85, and .78 respectively (Fitness & Curtis, 2005). For the current study Cronbach's α for the total scale was .88. The clarity and repair subscales have been found to be significantly negatively correlated with emotion focused and avoidant coping strategies (Fitness & Curtis, 2005) and attention has been found to be significantly positively correlated with the Self-Consciousness Scale (Palmer, Gignac, Bates, & Stough, 2003). It has been suggested that there is three-phase structural sequence of emotion management as measured by the TMMS that proposes that clarity of feelings is not possible without attention to them and repair of mood is not possible without clarity about the moods experienced. Using SEM with an Australian sample, it was found that the relationship between the attention and repair factors was mediated by clarity (Palmer, et al., 2003). As this measure was not designed as a clinical measure there are no clinical cut-off scores.

Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004). The AAQ is a 9-item self-report measure of experiential or emotional avoidance - an unwillingness to maintain contact with internal experience including bodily sensations, cognitions, emotions, and urges. Respondents rate the degree to which each statement applies to them

with responses from 1 *never true*) to 7 (*always true*). Items are considered diverse but consistent with the theory of experiential avoidance. Items range in focus from the presence of worry, or negative evaluations associated with private events, to the use of daydreaming as a method of regulation. Research has demonstrated that a single-factor solution provides the best model fit, with avoidance items loading positively at one end, and acceptance/action items loading negatively at the other (Walser, Townsend, Wilson, & Hayes, 1996). The AAQ shows good predictive validity in terms of its ability to predict higher levels of anxiety and depression (Hayes, Wilson, Strosahl, Gifford, & Follett, 1996). The AAQ has been found to correlate positively and significantly with the White Bear Suppression Inventory, the Dissociative Experiences Scale, the Thought Control Questionnaire, and the Post-Traumatic Stress Diagnostic Scale (Hayes, Wilson, Strosahl, Gifford, & Follett, 1996). Exploratory factor analysis (varimax rotation) in a sample of nonclinical participants resulted in a one-factor solution that accounted for approximately 25% of the overall variance. Internal consistency ($\alpha = .70$) has been found to be adequate (Zvolensky & Forsyth, 2002). Cronbach's α for this study was .41. Upper quartile scores for clinical populations were 42 and non-clinical populations 38 (Hayes et al., 2004).

Impulsivity

The UPPS Impulsivity Scale (UPPS; Whiteside & Lynam, 2001) is a 46-item inventory that is used to assess four distinct personality pathways to impulsive behaviour. The inventory was derived through a factor-analytic method that included well known impulsivity scales and contains four discrete facets of personality that lead to impulsive behaviour. These facets are reflected in the four subscales: urgency (difficulty coping with urges to act in response to negative affect), premeditation (ability to think and reflect

on consequences before engaging in an act), perseverance (ability to remain focused on a boring task), and sensation seeking (tendency to seek exciting activities and openness to experience). Response options for each items range from 1 = (*I agree strongly*) to 4 = (*I disagree strongly*) and responses are summed to create total and subscale scores. Items and scales are reverse scored where necessary so that higher scores on each subscale reflect greater impulsivity. Subscale interitem correlations have been reported to be good with Cronbach's $\alpha = .89, .87, .85$, and $.83$ respectively. Cronbach's α for this study were: $.81$ (urgency), $.87$ (premeditation), $.55$ (perseverance), and $.87$ (sensation seeking). Each component of the UPPS is differentially and significantly related to different aspects of personality and impulsivity measures in expected directions and it is proposed that each may be related to different forms of psychopathology (Whiteside & Lynam, 2001). All subscales, especially urgency and sensation seeking are able to distinguish clinical from non-clinical samples for alcoholic, gambling and Borderline Personality disordered participants (Whiteside, Lynam, Miller, & Reynolds, 2005). Although clinical cut-off scores have not been identified, means for subscales from a clinical and non-clinical sample have been reported. See Table 5.1 (Whiteside & Lynam, 2003).

Table 5.1

Means for the UPPS subscales in Clinical (N = 33) and Non-Clinical (N = 27) Sample

	Lack of Premeditation	Urgency	Sensation Seeking	Lack of Perseverance
Clinical	26.82	44.64	37.15	22.58
Non-clinical	21.47	31.38	25.51	19.83

Bulimia Nervosa and Binge Eating Disorder

The Eating Disorder Inventory-3 (EDI-3; Garner, 2004) is a 91 items self-report questionnaire designed to assess psychological characteristics and behavioural dimensions of bulimia and anorexia nervosa. The EDI-3 has 12 primary scales, three of which are eating-disorder-specific scales with nine general psychological scales that are highly relevant to eating disorders. The EDI-3 yields six composites: one that is eating-disorder specific (i.e., eating disorder risk) and five that are general integrative psychological constructs (i.e., ineffectiveness, interpersonal problems, affective problems, overcontrol, general psychological maladjustment). Participants rate how much each item applies to them on a 6-point scale, ranging from never to always with higher scores representing greater levels of eating-related psychopathology. Items are reverse scored as needed. Responses are weighted from 0 to 4 with a score of 4 reflecting more symptomatology. *Rarely* and *never* are weighted as zero based on the rationale that responses in the non-symptomatic direction should not contribute to a total subscale score reflecting psychopathology. Cut-off scores are based on normative data for different samples so that cut-off scores can be established compatible with clinical needs. Reliabilities for each composite are high for both clinical and normative groups. Alpha coefficients for international samples on the eating disorder risk Composite (EDRC) demonstrate good reliability ($\alpha = .91$ for a bulimic sample and .95 for eating disorder not otherwise specified). For the three eating disorder risk scales, all Cronbach's α 's are generally in the high .80s to low .90s across the groups. The interpersonal problems (IPC) and affective problems composites (APC) demonstrate high reliabilities for international samples ($\alpha = .81$ and .82 respectively). Test-retest coefficients were established at one

and seven days as the EDI-3 is designed to be sensitive to change over time. Test-retest reliability for the EDRC, IPC and APC were $r = .98$, $.98$, and $.93$ respectively. All EDI items are able to discriminate eating disordered from non-clinical samples. The EDI-3 has been found to correlate significantly and in predicted ways with other commonly used eating disorder measures (EAT-26; BULIT-R) and measures of personality (RSES; SCL-90) and psychopathology (MCMI-II) (Garner, 2004). Only the subscales in Table 5.2 were used in the current study. Drive for thinness, body dissatisfaction and bulimia are combined to create the composite Eating Disorder Risk scale. Internal consistency for the eating disorder risk composite in the current study was good ($\alpha = .95$). Cronbach's α 's for interoceptive deficits and emotion dysregulation were $.84$ and $.77$ respectively. (See Appendix 9 for a copy of this measure).

Table 5.2

Clinical Ranges of the EDI-3 Subscales Used

EDI-3 Subscale	Low	Typical	Elevated
Drive for Thinness	0 - 16	17 - 24	25 - 28
Bulimia	0 - 4	5 - 18	19 - 32
Body Dissatisfaction	0 - 21	22 - 35	36 - 40
Interoceptive Deficits	0 - 10	11 - 20	21 - 36
Emotional Dysregulation	0 - 3	4 - 9	10 - 32

Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006) is a 39-item self-report measure that was derived through a factor-analytic method that included well-known measures of mindfulness. Five facets of mindfulness were derived, which are reflected in the five subscales of non-reactivity to inner experience, observing, acting with awareness, describing/labelling with words, and non-judging of experience. Internal consistency is reported to be good with Cronbach's $\alpha = .75$ (non-reactivity), $.83$ (observing), $.87$ (acting with awareness), $.91$ (describing/labelling), and $.87$ (non-judging). Cronbach's α 's for the current study were: $.70$ (non-reactivity), $.75$ (observing), $.87$ (acting with awareness), $.40$ (describing/labelling), and $.85$ (non-judging). Response options range from 1 (*never or very rarely true*) to 5 (*very often or always true*) and summed to determine scores. Items and subscales are reverse scored where necessary so that higher scores reflect greater mindfulness.

The mindfulness facets have been found to be significantly associated in expected directions with related constructs (e.g. emotional intelligence, emotion regulation, experiential avoidance, thought suppression, dissociation and psychological symptoms). Three facets (act with awareness, non-judgement, and non-reactivity) have been found to show incremental validity in the prediction of psychological symptoms. Although observing external stimuli such as sounds, smells etc are considered central to mindfulness practice, the observe facet did not fit the hierarchical model in the full Confirmatory Factor Analysis. It was suggested that the observe facet may be sensitive to change with meditation experience and increased mindfulness skills (Baer, Smith,

Hopkins, Krietmeyer, & Toney, 2006). Clinical cut-offs have not been established, however means from a non-clinical student sample were: Observe = 24.49; Describe = 26.45; Awareness = 25.21; Nonjudge = 27.79; Nonreact = 20.46 (Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006). The FFMQ is currently the only measure that assesses all five facets of mindfulness (Baer et al., 2006).

General Dysfunction

The Outcome Questionnaire (OQ-45; Lambert, et al., 1996) is a 45-item self-report scale that measures client progress by repeated administration both during and at the termination of therapeutic interventions. The OQ-45 provides a total score, which provides a global assessment of client functioning, as well as three subscale scores of Subjective discomfort, interpersonal relationships, and social role performance. Subjective discomfort items measure intrapsychic functioning. The interpersonal relationships subscale assesses functioning in current relationships. The social role performance subscale measures difficulties or success in a range of common social roles, such as work or school. Response options to each item range from 1 (*never*) to 5 (*almost always*) with high scores indicating more disturbance. Total scores are obtained by adding item values for the entire instrument, yielding a maximum possible score of 180. Scores for the symptom distress subscale range from 0 –100, the interpersonal relations subscale from 0 – 44, and the social role subscale from 0 – 36.

The OQ-45 has been reported to have adequate reliability and validity in both clinical and normative populations, reporting good test-retest reliability (.84) and excellent internal consistency (.92) (Whipple et al., 2003). Cronbach's α for the current sample was .83. Concurrent validity for the entire instrument and subscales and criterion

measures have all been found to be significant beyond the .01 level of confidence (Lambert et al., 2004). The overall instrument has been found to be sensitive to change, in that significant improvements in client functioning has been found for those receiving psychotherapy compared to a control group (e.g. $d = .50$; Vermeersch, Lambert, & Burlingame, 2000).

To decrease the likelihood of response sets bias (e.g. having all negatively or positively worded items), 36 items are worded so that higher scores reflect more psychopathology, while nine items are worded so that lower scores reflect more psychopathology. These nine items are reversed before forming total scores (Whipple et al., 2003). Clinical cut-off scores for the total score and subscale scores were derived using the procedures suggested by Jacobson and Truax (1991). A total score below 63 indicates that the individual is more likely to be from a community sample than a clinical sample. Clinical cut-off for the symptom distress subscale is 36, the interpersonal relationships subscale is 15, and the social role performance subscale is 12. The reliable change index (RCI) is an indicator that change in a participant's score is not simply due to chance. The RCI for the total score is 14, the symptom distress subscale is 10, the interpersonal relationships subscale is 8, and the social role performance subscale is 7. For an individual to be recovered they must pass both cut-off and RCI criteria, to be improved they must pass the RCI criteria but not the cut-off, to be unchanged they need pass neither criteria, and to be considered as having deteriorated they must pass RCI criteria but towards a worsening direction. (See Appendix 8 for a copy of this measure).

Depression, Anxiety, and Stress

Depression, Anxiety, and Stress Scales (DASS 21; Lovibond & Lovibond, 1995). The DASS was originally developed to measure and distinguish between depression, anxiety and stress. The 21 item version is a self-report measure that consists of three 7-item subscales taken from the full version of the DASS. The three subscales are: depression, measuring dysphoric mood, sadness and worthlessness; anxiety, measuring physical arousal such as trembling and faintness; and stress, measuring irritability, tension, and over-reaction to events. Items are summed to obtain subscale and total scores with items reverse scored as necessary. Totals for each scale are doubled to obtain scores that are directly comparable with the full scale scores. It has been found that doubling the scores of the short version yield very similar values to scores derived from the full version. (Lovibond & Lovibond, 1995). It has been suggested that the 21-item version provides a cleaner factor structure than the original version (Antony, Beiling, Cox., Enns, & Swinson, 1998).

A Cronbach's α of .88 has been reported for the depression subscale, .82 for anxiety, .90 for stress and .93 for the total scale. Cronbach's α 's for this study were: .87, .82, and .83 respectively. Temporal stability has been established for all subscales: at three and eight years: depression ($r = .47$; $r = .35$); anxiety ($r = .46$; $r = .45$) and stress ($r = .34$; $r = .40$) respectively (Lovibond, 1998). Convergent validity was established with correlations between the DASS-21 and measures of negative and positive affect (PANAS), and two independent measures of anxiety and depression (The Hospital Anxiety Scale and The Personal Disturbance Scale) which were significant at the .01 level and were in expected directions (Henry & Crawford, 2005). For the current study,

the stress subscale was not included in analyses. Due to the high correlations between the depression and anxiety subscales in the clinical ($r = .51$) and non clinical groups ($r = .65$), these subscales were averaged to create a composite measure labelled Mood.

Table 5.3

Clinical Ranges for DASS-21 Subscales

DASS Sub-scale	Normal	Mild	Moderate	Severe	Extremely Severe
Depression	0 - 4	5 - 6	7 - 10	11 - 14	14 - 21
Anxiety	0 - 3	4 - 5	6 - 7	8 - 9	10 - 21
Stress	0 - 7	8 - 9	10 - 12	13 - 16	17 - 21

Alcohol and Drug Use

The Alcohol Use Disorders Identification Test (AUDIT; (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). This is a 10 item self-report measure designed to identify individuals who are drinking at harmful or hazardous levels. There are four conceptual domains: alcohol consumption, drinking behaviour related to dependence, adverse psychological reactions, and alcohol related problems. Items are measured on a five point scale (0 -4) and are summed to create an index of drinking behaviour and negative consequences. The AUDIT demonstrates good internal reliability with Cronbach's α 's ranging from .80 to .94 and good temporal stability with a test-retest coefficient of .88 over a 6-week period (Yersin et al., 1995). Cronbach's alpha for this study was .83. A cut-off score of 8 or more correctly classified 100% of individuals who were alcohol dependent (Dawe, Loxton, Hides, Kavanagh, & Mattick, 2002) and was

found to discriminate between individuals who drink at a hazardous level and individuals who do not with 92% sensitivity and 94% specificity (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993).

Drug Abuse Screening Test (DAST; Skinner, 1982). The DAST is a 20-item instrument that may be administered in either a self-report or in a structured interview format with each item requesting a "yes" or "no" response. It is designed to identify individuals who have a drug abuse (excluding alcohol) problem. The DAST is a unidimensional scale that yields a quantitative index score (0 – 20) of the degree of problems related to drug use in multiple domains including marital-family, and social relationships, employment, legal, and physical (medical symptoms and conditions). Total scores are obtained by summing all items that are endorsed in the direction of increased drug problems. Two items are keyed for a "No" response: "Can you get through the week without using drugs?" and "Are you always able to stop using drugs when you want to?" A DAST score of six or above is recommended to correctly identify participants with a drug disorder (Dawe, Loxton, Hides, Kavanagh, & Mattick, 2002). It is suggested that a score of 16 or greater be considered to indicate a very severe abuse or a dependency condition. The DAST demonstrates high internal consistency (.92) and has an 85% overall accuracy in identifying individuals who meet the DSM-III drug disorder diagnosis (DAST; Gavin, Ross, & Skinner, 1989). Cronbach's alpha for this study was .86.

Adult Attachment

The Experiences in Close Relationships Questionnaire – Revised (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R is a self-report measure of adult attachment containing 36 Likert-type items, half measuring anxiety (about abandonment)

and half measuring avoidance (discomfort with closeness and dependency). The original ECR incorporated most of the available self-report attachment measures, reduced them to 323 items and factor analysed the computed subscale scores to derive two independent factors anxiety and avoidance. Subjects were clustered into four groups based on scores on the two factors, which were conceptually similar to Bartholomew's (1990) types (e.g. secure, preoccupied, dismissing, and fearful). Clusters are derived through low scores on both avoidance and anxiety (secure); high on both anxiety and avoidance (fearful); low avoidance, high anxiety (preoccupied); and high avoidance, low anxiety (dismissing). Internal consistency of the original ECR was high for both factors avoidance ($\alpha = .94$) and anxiety ($\alpha = .91$) (Brennan, Clark, & Shaver, 1998). The ECR was revised to create the ECR-R based on an analysis of the original 323 items, using Item Response Theory to increase measurement precision. Twenty of the original items were kept with the additional 16 new items providing a higher degree of information than the original scales (Fraley, Waller, & Brennan, 2000). Items are reverse scored as necessary and summed to create subscale scores (Brennan, Clark, & Shaver, 1998). Internal reliability of the subscales is high, avoidance ($\alpha = .95$) and anxiety ($\alpha = .93$), and temporal stability over a 6-week period is high (above .86) for both subscales (Sibley & Liu, 2004). Cronbach's α 's for the current study were .89 (anxiety) and .33 (avoidance). While cut-off scores or clinical ranges have not yet been established the following means from a community sample can be seen in Table 5.5 (Evans & Wertheim, 2005).

Table 5.4

Means and Standard Deviations for Anxiety and Avoidance in a Community Sample (N = 286)

	Clinical Eating Disorder (N = 55)	Subclinical Eating Disorder (N = 42)	Depressed (N = 44)	Control (N = 80)
Anxiety	4.38 (1.23)	4.33 (0.88)	4.13 (1.07)	3.32 (1.17)
Avoidance	3.95 (1.14)	3.77 (1.10)	3.51 (0.99)	3.16 (1.03)

Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991). The RQ is based on Bowlby's (1973) theory of two types of internal working models that can be dichotomized as positive or negative views of self (as worthy of love and support or not) or other (as trustworthy and available as opposed to unreliable and rejecting) to yield four theoretical attachment styles. The four categories are: secure (comfortable with intimacy and autonomy); preoccupied (with relationships); dismissing (of intimacy); and fearful (of intimacy/socially avoidant) (Bartholomew & Horowitz, 1991). The RQ is designed to measure the respondents' relative commitment to each of these four styles firstly by choosing the category most like them. They are then asked to rate each category on a 7-point scale ranging from 1 *not at all like me* to 7 *very much like me* which allows for correlational tests of association between attachment style ratings and other variables, and provides a dimensional rating for each individual on each style (Brennan & Morris, 1997). Alpha coefficients range from .81 to .95 for the four RQ dimensions and support for construct validity has been provided by nonmetric multidimensional analysis (Bartholomew & Horowitz, 1991). Additionally, individual ratings of categories on the RQ have been found to significantly correspond with individual ratings on the Adult

Attachment Interview and on peer and family rated measures indicating convergence across these measures (Bartholomew & Shaver, 1998). Although there are limitations associated with using categorical measures, the RQ is one of the most widely used attachment measures (Garbarino, 1998).

Procedure

Following ethical approval from the Griffith University Human Subjects Research Committee, students participated in the study in exchange for partial course credit. Advertisement for participants was via electronic notice-boards on the university website or advertisements during scheduled lecture times. Participants signed up for study participation via the university website and presented at allocated rooms at pre-scheduled times. Those who volunteered to participate in the study were given a series of questionnaires to complete. Measures were administered by the researcher in an on-campus room. As per human subjects' research committee requirements, consent was implied by participation. There was no identifying information on the questionnaires. On average, the questionnaire took one hour to complete. Copies of the combined consent form and information sheet can be found in Appendix 1.

Results

Study 1: Results of Examining Emotion Dysregulation, Impulsivity, Mindfulness, Eating Disorder Symptoms, Mood, Attachment Orientation, and General Dysfunction in a Non-Clinical Population.

Missing Data, Skew, Transformations and Univariate Outliers

Data were examined for skew, outliers, and violations of assumptions. The mindfulness measure had significant skew. A square root transformation was applied to the mindfulness measure but this did not significantly improve the distribution. Measures of depression and anxiety also had significant skew. This type of skew is typical of clinical measures when used in convenience or community samples, with greater numbers of participants scoring at the lower end of the distribution and fewer scoring at the extreme high end of the distribution. Square root transformations did improve the skew to some degree. However, correlations estimated with the original and the transformed scores were quite similar. Subsequently, all analyses reported below were based on untransformed measures.

Twenty two outliers were identified on distributions. Performing analyses with and without outliers revealed minimal influence of these extreme scores. Hence, all participants were maintained in the analyses reported below.

Intercorrelations between Emotion Dysregulation Measures.

Multiple measures of emotion dysregulation were completed by participants. Means and standard deviations of these measures are reported in Table 1. As multiple measures of emotion dysregulation were included, initial analyses were conducted to determine if measures were highly intercorrelated and would provide similar information

when examining their relationship to other measures in the study. These correlations are shown in Table 5.5.

All measures representing emotion regulation and dysregulation were intercorrelated, as expected; r 's ranged from $-.17$ to $.71$. Due to these high correlations, only the DERS, which was developed to provide an integrative and comprehensive measure of the complex construct of emotion regulation, was examined in further analyses (Gratz & Roemer, 2004).

Table 5.5

Bivariate Correlations between Emotion Dysregulation Measures (N = 199)

Variables	2	3	4	5	<i>M</i>	<i>SD</i>
1. DERS	-.67**	.47**	.71**	.50**	82.43	21.43
2. TMMS	-	-.17*	-.63**	-.44**	109.55	14.06
3. INTERODEF			.61**	.67**	6.39	5.86
4. EDI EmD			-	.48**	4.00	4.49
5. AAQ				-	34.22	6.84

Note: DERS = Difficulties with Emotion Regulation Scale. TMMS = Trait Meta-Mood Scale. INTERODEF- Interceptive Deficits (EDI-3). EDI EmD – Emotion Dysregulation (EDI-3). AAQ – Experiential Avoidance.

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

Intercorrelations between attachment measures and mood measures.

There were strong correlations between the two attachment orientation subscales of anxiety and avoidance, ($r = .58$). Therefore these two scores were averaged to construct one score indicating greater attachment insecurity (insecure; see Table 5.6).

Measures of depression and anxiety also were highly correlated ($r = .65$) and were averaged to indicate general mood disorder (mood).

Table 5.6

Bivariate Correlations between Mood and Attachment Measures (N = 199)

Variables	2	3	4	5	6	<i>M</i>	<i>SD</i>
1. DASS Depression	.65	.37	.43			4.22	4.25
2. DASS Anxiety	-	.36	.36			4.31	3.98
3. Avoidant Attachment		-	.58			2.89	1.13
4. Anxious Attachment.			-			3.68	1.14
5. Attachment insecurity (average of avoidant and anxious)				-		3.28	1.00
6. Mood disorder (average of depression and anxiety)					-	4.26	3.73

Note. All correlations were significant with $p < .01$.

Descriptives and Correlations of Emotion Dysregulation with Other Measures.

Descriptive Analysis

Means and standard deviations of other measures are presented in Table 5.7.

Almost one half (46.2%) of participants were classified as secure on the RQ whereas 22.6% were fearful, 15.6% preoccupied, and 15.6% dismissing. Only the secure category was used for data analysis as a measurement of attachment security cannot be obtained from the ECR-R.

Table 5.7

Means and Standard Deviations of Variables to be used for Remaining Analyses

Variable	<i>M</i>	<i>SD</i>
Emotion Dysregulation	82.43	21.43
Mood	.00	.91
Insecure	3.28	.45
Secure	4.47	1.82
Mindfulness	125.36	16.37
Impulsivity	105.16	13.08
Urgency	28.26	6.17
Eating Disorder Symptoms	30.61	22.17
General Dysfunction	52.60	20.57

Note: Emotion Dysregulation = Difficulties with Emotion Regulation Scale. Mood – DASS Depression & Anxiety combined. Insecure – anxiety and avoidance subscales combined. SECURE = Secure Attachment. Mindfulness – Five Factor Mindfulness Questionnaire. Impulsivity = UPPS Impulsivity Scale. Urgency – Urgency Facet of Impulsivity Scale. Eating Disorder Symptoms – Eating Disorder Risk (EDI-3). General Dysfunction – OQ-45 Outcomes Questionnaire.

Correlations of emotion dysregulation with other measures. As expected, individuals who reported difficulties with emotion regulation were also more impulsive, less mindful, and reported greater attachment insecurity (see Table 5.8). Correlations ranged from $r = .45$ to $r = -.71$. Emotion dysregulation was significantly correlated with impulsivity ($r = .41$) and with urgency ($r = .47$). Emotion dysregulation was highly and negatively correlated with mindfulness ($r = -.71$) as expected, indicating that individuals with greater emotion dysregulation reported significantly less mindfulness. Emotion

dysregulation was associated with attachment style in predicted ways where individuals with greater attachment insecurity had greater difficulty with emotion dysregulation ($r = .45$) and individuals with greater attachment security were less emotionally dysregulated ($r = -.42$).

Emotion dysregulation was highly correlated with mood problems ($r = .65$) and problems with general functioning ($r = .67$) showing that individuals who reported more emotion dysregulation also reported more symptoms of depression, and anxiety and had worse general functioning (see Table 5.8). Individuals reporting more emotional dysregulation also had more eating disorder symptoms which means they reported a combination of greater body dissatisfaction, drive for thinness, and bulimic symptoms and cognitions ($r = .49$).

Correlations between mindfulness, impulsivity, attachment, mood, general functioning, and eating disorder symptoms. The anticipated correlates of emotion dysregulation were intercorrelated with each other. As expected, individuals who reported being more mindful were less impulsive ($r = -.33$), and had less urgency ($r = -.29$; see Table 5.8). Individuals higher in attachment security were also more mindful ($r = .37$), whereas the opposite was found for individuals with greater attachment insecurity ($r = -.45$). Greater mindfulness was also associated with fewer mood problems ($r = -.54$), fewer problems with general functioning ($r = -.55$) and less eating disorder symptoms ($r = -.34$).

Table 5.8

Bivariate Correlations between All Variables (N = 199)

Variables	2	3	4	5	6	7	8	9
1. Emotion Dysregulation	.65	.45	-.42	-.71	.41	.47	.49	.67
2. Mood	-	.47	-.40	-.54	.33	.41	.42	.72
3. Insecure		-	-.57	-.45	.30	.37	.40	.51
4. Secure			-	.37	-.12ns	-.24	-.35	-.40
5. Mindfulness				-	-.33	-.29	-.34	-.55
6. Impulsivity					-	.63	.23	.30
7. Urgency						-	.45	.44
8. Eating Disorder Symptoms							-	.43
9. General Dysfunction								-

Note: Emotion Dysregulation = Difficulties with Emotion Regulation Scale. Mood – DASS Depression & Anxiety combined. Insecure – anxiety and avoidance subscales combined. Secure = Secure Attachment. Mindfulness – Five Factor Mindfulness Questionnaire. Impulsivity = UPPS Impulsivity Scale. Urgency – Urgency Facet of Impulsivity Scale. Eating Disorder Symptoms – Eating Disorder Risk (EDI-3). General Dysfunction – OQ-45 Outcomes Questionnaire.

All $p < .01$ except where indicated with *ns*.

Individuals who reported being more impulsive had more problems with mood ($r = .33$) and general functioning ($r = .30$) and had more eating disorder symptoms ($r = .23$). Similarly, and as expected, individuals with greater urgency had more eating disorder symptoms ($r = .45$), and had more problems with mood ($r = .41$) and general functioning ($r = .44$). Participants higher in attachment insecurity were more impulsive ($r = .30$), had greater urgency ($r = .37$), had more problems with mood ($r = .47$) and general functioning ($r = .51$), and had more eating disorder symptoms ($r = .40$). Individuals higher in

attachment security reported less urgency ($r = -.24$), fewer problems with mood ($r = -.40$) and general functioning ($r = -.40$) and had fewer eating disorder symptoms ($r = -.35$). Mood problems and poor general functioning were highly correlated ($r = .72$).

Summary of Findings.

Consistent with theory, individuals who reported greater attachment insecurity were more emotionally dysregulated. With greater emotional dysregulation, individuals were also more likely to have other difficulties including reporting more mood problems, more problems with general functioning, more impulsivity, and behaviours and cognitions that indicate more eating disorder symptoms.

Mindfulness, however, was highly negatively correlated with emotion dysregulation consistent with suggestions that mindfulness is the antithesis of emotion dysregulation (Bishop, 2002). Consistent with this conceptualisation, greater mindfulness was also associated with fewer problems in all domains and with greater attachment security.

Multivariate Analyses of the Correlates of Emotion Dysregulation. Regression models were estimated to determine the unique association of other measured variables with emotion dysregulation as measured by the DERS. Two models were estimated. The first was used to examine the unique association of variables to emotion dysregulation using the DERS (see Table 5.9). Only variables with a significant bivariate correlation with the DERS were entered in the model. These variables included mindfulness, general functioning, eating disorder symptoms, attachment insecurity, mood and urgency. Urgency was examined in a separate model to the total impulsivity score due to findings in previous research that indicate that urgency has unique relationships with other

variables (Fischer, Smith, Spillane, & Cyders, 2005). Therefore the second regression model examined the unique association of variables to emotion dysregulation using the DERS but included the total impulsivity score rather than the urgency facet. Variables were again entered in order based on the magnitude of their correlation with the DERS.

For all regressions, multicollinearity was assessed by calculating tolerance values and variance inflation scores (VIF). Multivariate outliers were assessed by inspection of partial regression plots, studentised residuals, Mahalanobis Distance, Cooks distance and leverage values. These regression diagnostics are described throughout the analyses.

Unique correlates of difficulties with emotion regulation measured by the DERS. In the first model, the independent variables accounted for 68% of the variance in emotion dysregulation, $F(6,192) = 66.68, p < .01$. Mindfulness, general dysfunction, eating disorder symptoms, mood, and urgency were all significant unique correlates of emotion dysregulation with mindfulness accounting for the largest variance. The direction of associations showed that individuals with more emotion dysregulation reported less mindfulness, more difficulties with general functioning, mood, and urgency, and had more eating disorder symptoms. After accounting for all other variables, insecure attachment orientation failed to show a significant unique association with emotion dysregulation and had a small beta value.

Table 5.9

Results of Regressing Emotion Dysregulation (DERS) on Mindfulness, Attachment Insecurity, Mood, General Dysfunction, and Urgency (N=199)

Variables	R^2	B	$SE\ B$	β
Mindfulness		-.57	.07	-.44***
General Dysfunction		.23	.07	.22***
Eating Disorder Symptoms		.13	.05	.14**
Insecure		-.90	1.09	-.04
Mood		3.85	1.47	.16**
Urgency		.48	.17	.14**

Note. $R^2 = .68$, $F(6, 192) = 66.68$, $p < .01$.

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

Inspection of tolerance values and VIF revealed that no values fit the criteria for multicollinearity. Three univariate outliers and one multivariate outlier were identified, removed individually and the analysis repeated. Fifteen influential scores were identified. Each was removed and the analysis repeated. The results after removal of outliers and influential scores were similar to the results reported here.

In the second model (see Table 5.10), entering impulsivity along with the variables in the first model revealed a significant unique association of impulsivity with emotion dysregulation, $\beta = .13$, $p < .01$. However, no additional variance was accounted for in emotion dysregulation when compared to the first model, 68%, $F(6,192) = 66.72$, p

< .001, and mindfulness remained the most strongly associated with emotion dysregulation.

Table 5.10

Results of Regressing Emotion Dysregulation (DERS) on Mindfulness, Eating Disorder Symptoms, Insecure Attachment, Mood Composite, General Dysfunction, and Impulsivity (N=199)

Variables	R^2	B	$SE\ B$	β
Mindfulness		-.54	.07	-.41***
General Dysfunction		.25	.07	.24***
Eating Disorder Symptoms		.16	.05	.17***
Insecure		-.93	1.09	-.04
Mood		3.79	1.47	.16*
Impulsivity		.21	.07	.13**

Note. $R^2 = .68$, $F(6, 192) = 66.72$, $p < .001$.

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

Again, multicollinearity was not identified as problematic. No outliers and fifteen influential scores were identified and removed individually from the analysis and the analysis repeated. The results after removal were not notably different from the previous results.

Summary of the unique correlates of emotional dysregulation. In summary, mindfulness accounted for the greatest amount of variance in emotion dysregulation.

Contrary to expectations, insecure attachment was not significantly related to emotion dysregulation after controlling for other variables. Also, contrary to expectations that urgency would have a stronger relationship with emotion dysregulation than impulsivity, both impulsivity and urgency were uniquely related to emotion dysregulation after controlling for other variables with the magnitude of the relationship being similar for both. Additionally, eating disorder symptoms were significantly related to emotion dysregulation but with a relatively small magnitude after controlling for mindfulness and general dysfunction.

Associations between Subscales of Emotion Dysregulation and Impulsivity

To examine associations between the multiple subscales of emotion dysregulation (DERS) and impulsivity (UPPS) measures, two regression models were estimated. The first model regressed total emotion dysregulation (DERS total score) on the UPPS subscales of urgency, lack of perseverance, lack of premeditation, and sensation seeking (see Table 5.11). The second model regressed the total UPPS impulsivity scale on the DERS subscales of non-acceptance of emotion, emotion regulation goals, impulse control, awareness of emotion, access to emotion regulation strategies and emotional clarity (see Table 5.12).

In the first model, the independent variables accounted for 25% of the variance in total emotion dysregulation, $F(4,194) = 17.44, p < .001$. Urgency and lack of perseverance were both significant unique correlates of emotion dysregulation. Individuals who reported being more emotionally dysregulated reported having less perseverance and were more likely to act rashly when emotionally distressed.

Table 5.11

Results of Regressing Emotion Dysregulation (DERS) on UPPS Impulsivity Subscales

(*N*=199)

Variables	R^2	B	$SE\ B$	β
Urgency		1.40	.23	.40**
Lack of Perseverance		.81	.22	.17*
Lack of Premeditation		.46	.28	.11
Sensation Seeking		.05	.21	.02

Note. $R^2 = .25$, $F(4,194) = 17.44$, $p < .001$. DV = Total DERS emotion dysregulation score

* $p < .05$. ** $p < .001$.

Inspection of tolerance values and VIF revealed that no values fit the criteria for multicollinearity. Two multivariate outliers were identified, removed individually and the analysis repeated. Nineteen influential scores were identified. Each was removed and the analysis repeated. The results after removal of outliers and influential scores were similar to the results reported here.

In the second model, the subscales of emotion dysregulation accounted for 17% of the variance in impulsivity, $F(6,192) = 7.73$, $p < .001$. Difficulties with impulse control was the only significant unique correlate of impulsivity as measured by the UPPS impulsivity scale. Individuals who reported having more impulse control difficulties when upset (DERS) were also more impulsive (UPPS). Other facets of emotion dysregulation were not as important as can be seen in Table 5.12. Direction of

associations indicated that individuals who reported being more accepting of their emotions also reported being more impulsive and those that reported being more emotionally dysregulated also reported being more impulsive. Individuals who reported having limited access to emotion regulation strategies also reported being more impulsive.

Table 5.12

Results of Regressing UPPS Impulsivity Scale on Emotion Dysregulation (DERS)

Subscales (N=199)

Variables	R^2	B	$SE\ B$	β
Non Acceptance		-.22	.24	-.08
Goals		.20	.24	.07
Impulse		.70	.28	.25*
Awareness		.27	.23	.09
Strategies		.32	.22	.17
Clarity		.26	.33	.07

Note. $R^2 = .17$, $F(6,192) = 7.73$, $p < .001$.

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

Inspection of tolerance values and VIF revealed that no values fit the criteria for multicollinearity. One multivariate outlier was identified, removed and the analysis repeated. Ten influential scores were identified. Each was removed and the analysis

repeated. The results after removal of outliers and influential scores were similar to the results reported here.

Multivariate analysis of Eating Disorder Symptoms. Two regressions were conducted to determine the unique association of variables with eating disorder symptom measures. The first regression model examined the unique association of variables to eating disorder symptoms using the composite measure from the EDI-3 (see Table 5.13). Only variables with a significant bivariate correlation with eating disorder symptoms were entered in the model. These variables included emotion dysregulation, urgency, general dysfunction, mood, insecure attachment, secure attachment, mindfulness, and impulsivity. As with previous regressions, the second model was used to examine the associations between the total impulsivity score and eating disorder symptoms rather than the association between urgency and eating disorder symptoms (see Table 5.14).

In the first model, the independent variables accounted for 34% of the variance in risk for an eating disorder, $F(7,191) = 14.01, p < .001$. Difficulties with emotion regulation and urgency were both significant unique correlates of eating disorder symptoms. The direction of associations showed that individuals who had more eating disorder symptoms also reported greater difficulty with emotion regulation, more difficulties with general functioning, and mood, were more insecurely attached, and reported more urgency. The magnitude of the relationship with attachment measures (insecure and secure) were similar although not significant. Contrary to expectations, mindfulness was not a unique, significant correlate of eating disorder symptoms when accounting for the significant associations of emotion dysregulation, and urgency with

eating disorder symptoms, as well as controlling for general dysfunction, attachment orientation and mood.

Table 5.13

Results of Regressing Eating Disorder Symptoms on Emotion Dysregulation

(DERS), Mindfulness, Attachment Security and Insecurity, Mood, General Dysfunction, and the Urgency subscale of Impulsivity (N=199)

Variables	R^2	B	$SE\ B$	β
Emotion Dysregulation		.27	.11	.26*
Urgency		.85	.25	.24**
General Dysfunction		.03	.10	.03
Mood		1.53	2.21	.06
Insecure		2.72	1.76	.12
Secure		-1.18	.90	-.10
Mindfulness		.07	.12	.05

Note. $R^2 = .34$, $F(7,191) = 14.01$, $p < .001$.

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

Inspection of tolerance values and VIF revealed that no values fit the criteria for multicollinearity. Two multivariate outliers were identified, removed individually and the analysis repeated. Twenty influential scores were identified. Each was removed and the analysis repeated. The results after removal of outliers and influential scores were similar to the results reported here.

The second model entered the total impulsivity score instead of urgency (see Table 5.14). The variance accounted for in eating disorder symptoms was similar, but slightly less, when compared to the first model, 30%, $F(7,191) = 11.72$, $p < .001$. The direction of associations remained the same. Emotion dysregulation had the largest significant unique association with eating disorder symptoms, however, in this model, attachment insecurity was the only other variable with a significant unique association after accounting for all other variables.

Table 5.14

Results of Regressing Eating Disorder Symptoms on Emotion Dysregulation (DERS), Mindfulness, Attachment Security and Insecurity, Mood, General Dysfunction, and Impulsivity (N=199)

Variables	R^2	B	$SE\ B$	β
Emotion Dysregulation		.36	.11	.35**
General Dysfunction		.07	.10	.06
Mood		1.95	2.28	.08
Insecure		3.66	1.82	.17*
Secure		-1.04	.94	-.09
Mindfulness		.12	.12	.09
Impulsivity		.02	.12	.01

Note. $R^2 = .30$, $F(7,191) = 11.72$, $p < .001$.

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

Inspection of tolerance values and VIF revealed that no values fit the criteria for multicollinearity. Six influential scores were identified. Each was removed and the analysis repeated. Removal of influential scores did not produce notably different result from those reported here.

Summary of Multivariate Analyses of Emotion Dysregulation, Impulsivity and Eating Disorder Symptoms. In summary, emotion dysregulation accounted for the greatest amount of variance in eating disorder symptoms. When urgency was included in the model, it had a relationship to eating disorder symptoms of a similar magnitude as emotion dysregulation. Urgency and lack of premeditation were significant unique correlates of emotion dysregulation but only difficulties with impulse control when upset (DERS impulse) was uniquely associated with impulsivity (UPPS). Contrary to expectations, impulsivity was not significantly related to eating disorder symptoms after controlling for all other variables, and attachment insecurity was the only other variable with a unique significant association. Again, contrary to expectations, mindfulness did not have a significant unique association with eating disorder symptoms after accounting for the significant associations of emotion dysregulation and attachment insecurity with eating disorder symptoms.

Associations between Subscales of Emotion Dysregulation, Mindfulness, and Eating Disorder Symptoms. In order to further understand the relationship between emotion dysregulation, mindfulness, and eating disorder symptoms, correlations between subscales of the DERS, Five Factor Mindfulness Questionnaire, and the EDI-3 Eating Disorder Risk composite were examined (see Table 5.15).

Individuals who reported more emotion dysregulation also reported having more difficulties with all aspects of eating disorder symptoms (bulimia, drive for thinness, and body dissatisfaction). Correlations ranged from $r = .24$ to $r = .48$ (see Table 5.15).

Individuals who reported being more judgemental of experience (M Non-judge) were more reactive to inner experience (M Non-react), and reported being more distracted and unfocused (M Aware) and were more likely to report problems with bulimia, drive for thinness, and body dissatisfaction. Correlations ranged from $r = -.20$ to $r = -.45$ (see Table 5.15).

Summary of associations between mindfulness and emotion dysregulation.

Individuals who reported being less accepting of their emotional responses (DERS Non-accept), had less access to emotion regulation strategies (DERS Strategies; $r = .70$), had more difficulty engaging in goal directed behaviour when upset (DERS Goals; $r = .43$), and had less clarity about their emotions (DERS Clarity; $r = .50$). They also reported being more reactive to inner experience (M Non-react; $r = -.21$), less aware of their environment and inner experience (M Aware; $r = -.38$), were less able to describe their thoughts and feelings (M Label; $r = -.29$) and were more judgemental of experience (M Non-judge; $r = -.66$). Individuals who reported being more emotionally aware (DERS Aware) also reported being more observant of sensations, perceptions and feelings (M Observe) ($r = -.42$). Being emotionally aware (DERS Aware) was not significantly associated with being less judgemental (M Non-judge). Individuals who reported being more impulsive (DERS Impulsive) also reported being more on ‘automatic pilot’ ($r = -.36$; M Aware), more judgemental of experience ($r = -.52$; M Non-judge), and more reactive to inner experience ($r = -.33$; M Non-react). In addition to the difficulties just

reported, those that reported being more impulsive also had less ability to describe their feelings, thoughts and sensations.

Summary of findings. Most facets of emotion dysregulation and mindfulness were related to eating disorder symptoms in expected ways. Individuals who were more emotionally dysregulated and less mindful tended to have more eating disorder symptoms, cognitions, and behaviours.

Table 5.15

Study 1 Correlations between subscales of Emotion Dysregulation, Mindfulness, and Eating Disorder Symptoms (N = 199)

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14
1. DERS Non-Acc	.43	.62	.19	.70	.50	-.21	-.09ns	-.38	-.29	-.66	.44	.48	.45
2. DERS Goals		.71	.18ns	.51	.36	-.22	.18ns	-.41	-.20	-.28	.38	.34	.31
3. DERS Impulsivity		-	.14ns	.71	.50	-.33	.04ns	-.36	-.23	-.52	.38	.32	.33
4. DERS Awareness			-	.20	.52	-.24	-.42	-.21	-.61	-.03ns	.07ns	-.00ns	.09ns
5. DERS Strategies				-	.58	-.33	-.05	-.37	-.33	-.55	.48	.45	.44
6. DERS Clarity					-	-.24	-.12ns	-.45	-.62	-.40	.28	.24	.29
7. M NonReact						-	.19	-.03ns	.23	.12ns	-.23	-.20	-.26
8. M Observe							-	-.02ns	.22	.05ns	.10ns	.17*	.05ns
9. M Aware								-	.38	.32	-.29	-.20	-.22
10. M Label									-	.14*	-.14*	-.10ns	-.18*
11. M NonJudge										-	-.33	-.46	-.38
12. EDI Bulimia											-	.69	.67
13. EDI Drive for Thinness												-	.82
14. EDI Body Dissatisfaction													-

Note: DERS = Difficulties with Emotion Regulation Scale. Subscales: Non-Acceptance, Goals, Impulsivity, Awareness, Strategies, Clarity.

FFMQ = Five Factor Mindfulness Questionnaire. Subscales: Non-React, Observe, Awareness, Label, Non-Judgement. EDI = Eating

Disorder Inventory 3. Subscales: Bulimia, Drive for Thinness, Body Dissatisfaction.

*Note: all significant at $p < .01$ unless ns non-significant or $*p < .05$*

Discussion Study 1

It has been suggested that there is a pervasive impact of emotion dysregulation on psychological functioning (Bradley, 2003; Gratz & Roemer, 2004). The aim of this study was to examine the relationships between emotion dysregulation, impulsivity, mindfulness, eating disorder symptoms, attachment orientation, mood and general dysfunction in a non-clinical sample. Results showed that, as expected, emotion dysregulation did have important links with a range of other indicators of dysfunction. In particular, individuals with more emotion dysregulation were also more impulsive, more depressed and/or anxious, had more difficulties in life domains such as interpersonal relationships, and performance of work, pleasure, family, and social roles. As found in previous studies, participants had greater attachment insecurity when they were more emotionally dysregulated which could indicate more pervasive interpersonal dysfunction, because attachment insecurity has been associated with emotional lability, anxiety and impulsiveness (Mikulincer, Orbach, & Iavneli, 1998; Pietromonaco, & Barratt, 2000). Additionally, individuals who were more emotionally dysregulated had more eating disorder symptoms, they reported higher levels of body dissatisfaction, drive for thinness, and behaviours and cognitions associated with bulimia. Emotion dysregulation is noticeably detrimental to psychological and emotional health, and is suggestive of multiple aspects of dysfunction, both intrapersonal and interpersonal. These results lend some support to arguments presented by previous researchers that have suggested that emotion dysregulation underlies all psychopathology (Bradley, 2003; Gratz & Roemer, 2004).

Emotion dysregulation also demonstrated medium to large inverse relationships with measures that have been suggested as depicting psychological health (attachment security and mindfulness), indicating that individuals with better emotion regulation also tend to have better psychological functioning in other domains. As previously found, attachment security has been associated with better coping, more positive daily emotional experience, and more positive views of self and others (Mikulincer, Orbach, & Iavnieli, 1998; Mikulincer & Sheffi, 2000). Being more mindful has been associated with being self-compassionate, emotionally intelligent, and being more flexible, accepting, and less impulsive when dealing with problems (Bishop et al., 2004; Brown & Ryan, 2003; Roemer & Orsillo, 2003). Implementing strategies to help individuals improve their emotion regulation skills could therefore provide a protective factor against poor psychological and emotional functioning, and may even improve emotional and psychological functioning for individuals without mental health difficulties.

The examination of the unique correlates of emotion dysregulation further supported the centrality of emotion dysregulation to poor psychological functioning. Mindfulness, which represents good psychological health, demonstrated the strongest inverse relationship with emotion dysregulation whereas general dysfunction and mood problems were positively associated with emotion dysregulation. This suggests that the development of mindfulness skills would likely result in the improvement of emotion regulation, and that again, emotion dysregulation affects multiple aspects of functioning in a detrimental way. Impulsivity, and risk for an eating disorder were also significant unique correlates of emotion dysregulation. Results for mindfulness, impulsivity, eating disorder symptoms; will be further elaborated below.

Mindfulness

The highest bivariate correlation was found between mindfulness and emotion dysregulation. Mindfulness was also the strongest unique predictor of emotion dysregulation when controlling for all other variables. Mindfulness has been described as being essentially the antithesis of emotion dysregulation and results from this study largely support this statement (Bishop et al., 2004). Mindfulness has been suggested as providing an emotion regulatory function in a number of ways. Mindfulness is believed to reduce experiential avoidance and is thought to facilitate a greater ability to tolerate distress (Hayes & Shenk, 2004; Vervaeke, Heeringa, & Audenaert, 2004). The acceptance factor of mindfulness is believed to change the subjective meaning of emotional distress, making it less threatening and easier to regulate (Kabat-Zinn, 1990; Linehan, 1993). Mindfulness reduces cognitive elaboration, leaving more resources available for employing emotion regulating strategies (Schulman, Augustine, & Hemenover, 2006). Further examples can be found in the previous review of mindfulness and emotion regulation. What can be seen is that mindfulness increases the ability to regulate emotions in multi-faceted ways.

Mindfulness was also highly negatively correlated with mood problems and general dysfunction, and to a lesser extent, impulsivity and eating disorder symptoms. It would therefore appear that including a mindfulness component in interventions may address emotion dysregulation, while also suggesting that mindfulness interventions may be promising for a range of disorders. The success of using mindfulness to treat problems with mood and general functioning has been demonstrated previously with such diverse disorders and populations as chronic pain sufferers, nurses with burnout, and individuals

with depression, anxiety disorders, and eating disorders (Cohen-Katz, et al., 2005; Hayes & Feldman, 2004; Orsillo, Roemer, Lerner, & Tull, 2005).

When examining unique correlates of eating disorder symptoms mindfulness was not a significant unique contributor. However, considering the high correlations between mindfulness and emotion dysregulation, this finding does not rule out the strong possibility that both emotion dysregulation and mindfulness are important correlates of eating disorder symptoms. Further studies examining the contribution of mindfulness and emotion regulation to eating disorder symptoms might consider 1) latent variables that drive shared variance of mindfulness and emotion regulation; or 2) path models to examine potential mediators. Other concerns (emotion dysregulation, urgency, and insecure attachment orientation) were more important in contribution to eating disorder symptoms in this non-clinical sample. In Study 2 this relationship will again be examined with a clinical group who suffer from an eating disorder.

Emotion Dysregulation and Impulsivity

Emotion dysregulation and impulsivity are frequently comorbid in psychological disorders and it has been suggested that impulsive behaviours may be an outcome of emotion dysregulation (Cassin & von Ranson, 2005; Claes, Vandereycken, & Vertommen, 2005; Flores, 2001; Zvolensky & Forsyth, 2002). Findings from this study indicated that emotion dysregulation and impulsivity shared a moderate relationship when examining correlations, and both the urgency subscale and total impulsivity score were significant unique correlates of emotion dysregulation in regressions. While these findings confirmed that emotion dysregulation and urgency tend to co-occur, which is the cause of the other could not be determined.

Additional regression models were used to more specifically test the nature of the relationships between impulsivity and emotion dysregulation using subscales of the impulsivity and emotion dysregulation measures. What emerged was that only the emotion dysregulation subscale *impulse* (difficulties with impulse control) was uniquely associated with impulsivity. This is contrary to literature that suggests that impulsivity stems from chronic internal and emotional dysregulation (L'Abate, 1993; Marks-Tarlow, 1993). It would be expected that all emotion dysregulation factors would be related to impulsivity if this was the case. However, items in the impulse subscale of the emotion dysregulation measure all begin with “when I’m upset” followed by examples of difficulties controlling impulsive behaviours. The way in which these questions are asked suggests that only the urgency facet of impulsivity is being tapped. As urgency is the tendency to act rashly when upset, it follows that urgency may be the means by which emotion dysregulation results in maladaptive impulsive action (Fischer, Smith, Spillane, & Cyders, 2005). When regressing impulsivity on emotion dysregulation, urgency was again the largest unique correlate further supporting this assumption.

Contrary to expectations, greater acceptance of emotions (DERS non-acceptance) was positively correlated with impulsivity. Examination of items on the subscale DERS non-acceptance of emotions indicate that an individual scoring high on this subscale would experience shame, embarrassment, and guilt at feeling upset. There may be the possibility that individuals who are impulsive are more likely to act to alleviate the negative mood rather than dwelling on, and feeling shame and embarrassment for being upset. In support of this it has been suggested that impulsive individuals have the

tendency to act rather than think in response to internal or environmental demands (Barratt, 1993; McGown, 1993).

Impulsivity and Eating Disorder Symptoms

There have previously been inconsistent findings in relationships between impulsivity and eating disorders (Stice, 2002). For example there is considerable research that has found that heightened impulsivity, as measured by a range of instruments, distinguishes women diagnosed with binge eating disorders from non-eating disordered women (Claes, Vandereycken, & Vertommen, 2002; Fischer, Smith, & Anderson, 2003; Vervaet, Audenaert, & van Heeringen, 2003). Others have found that restricted eating better predicted binge episodes than impulsivity (Steiger, Lehoux, & Gauvin, 1999) and it was reported that impulsivity did not predict increases in bulimic symptoms or eating pathology (see Stice, 2002 for meta-analysis).

Results from Study 1 suggest that while other facets of impulsivity may not play a central role, urgency may be the most significant contributing factor to eating disorder symptoms. This is consistent with previous research that has found that urgency related most strongly to bulimia nervosa and had the largest effect size (.38) above other facets of impulsivity (sensation seeking, lack of planning and lack of perseverance) (see Fischer, Smith, & Cyders, 2008 for meta-analysis). When examining unique correlates of eating disorder symptoms, urgency, but not other facets of impulsivity, was a significant unique predictor. While it has been suggested that the unitary construct of impulsivity plays a central role in the maintenance of eating disorders (Cassin & von Ranson, 2005; Engel, et al., 2005; Steiger, Lehoux, & Gauvin, 1999), results from this research suggest

that this may not be entirely accurate and urgency rather than all facets of impulsivity is more highly related to eating disorder symptoms.

Results of Study 1 did establish that emotion dysregulation is a significant correlate of eating disorder symptoms when controlling for all other variables measured, with only urgency sharing a relationship with eating disorder symptoms of a similar magnitude. This again supports that it may be more appropriate to view eating disorders, or at least symptoms of eating disorders from the perspective of an emotion dysregulation model (Heatherton & Baumeister, 1991; Tice, et al., 2001; Trattner-Sherman & Thompson, 1990). However, as few participants from the current study reported eating disordered behaviours and cognitions at clinical levels, the findings must be considered in the context of the non-clinical group. The contribution of emotion dysregulation and urgency to eating disorder risk in a clinical population are examined in Study 2 (see Chapter 6).

Attachment Orientation

Although emotion dysregulation is believed to stem from early attachment insecurity, in multivariate models attachment insecurity was not a significant unique correlate of emotion dysregulation. Rather, sources of distress such as depression, anxiety, problems with general functioning, urgency and issues such as body dissatisfaction and drive for thinness appear to be more immediate in contributing to an emotionally dysregulated state. Although attachment insecurity was not a unique correlate of emotion dysregulation, it was related to other variables in expected ways. Individuals who reported higher levels of attachment insecurity also reported being more impulsive, more at risk for developing an eating disorder, having more mood problems,

more difficulty with general functioning, and were less mindful. This presents a similar profile to the emotionally dysregulated individual. This may indicate that while early attachment insecurity may result in emotion dysregulation, mood and general functioning difficulties may contribute more to emotion dysregulation later in life. In future studies, with the appropriate methodology and sample size, path analysis would help to further elucidate this possibility.

As expected, results indicated that having greater attachment security seemed to be a protective factor against poor psychological functioning and was associated with better emotion regulation. Contrary to expectations, attachment security was not significantly associated with impulsivity, possibly due to the small sample size. However, correlations were in expected directions. Certain impulsive behaviours are believed to be the result of secondary attachment behaviours. For example, the individual may binge eat in the perceived absence of supportive attachment figures (Flores, 2001; Johnson, Maddeaux, & Blouin, 1998). It would therefore be expected that greater attachment security, which should allow individuals to draw on the support of others at times of distress, would be inversely related to impulsivity. There was however, a significant negative correlation between attachment security and eating disorder symptoms. These analyses were correlational so they do not, conclusively answer the question of whether impulsive behaviours are secondary attachment behaviours.

In summary, emotion dysregulation appears to play a central role in poor psychological functioning, whereas mindfulness appears strongly negatively associated with emotion dysregulation and covaries with better psychological and social functioning. Emotion dysregulation and impulsivity appear to be comorbid in poor psychological

functioning, and place individuals at greater risk for eating disorders. While impulsivity has been found to be central in the maintenance of eating disorders, it appears that a particular subscale of impulsivity, urgency, defined as rash action while distressed, may be the most important facet of impulsivity that contributes to disordered eating.

As poor psychological and general functioning are generally found to be higher in clinical as opposed to non-clinical populations (Werner & Gross, 2009), and urgency has been specifically related to problem binge eating (Fischer, Smith & Cyders, 2008), a group of women who met the criteria for either bulimia or binge eating disorder were chosen in order to perform the same analyses from Study 1. The following study, Study 2a, aimed to expand on the results of Study 1 by establishing whether the pattern of relationships was similar for clinical and non-clinical populations, thereby improving generalisability. Furthermore, as mindfulness has been hypothesised to be a protective factor for eating disorder symptoms and emotion dysregulation and measures of poor psychological functioning in Study 1, an 8-week mindfulness intervention was assessed in Study 2b for its impact on emotion dysregulation, eating disorder symptoms, impulsivity and urgency, general dysfunction and mood problems.

Chapter 6

Study 2: Emotion Dysregulation, Impulsivity, Mindfulness, Eating Disorder Symptoms, Mood, Attachment Orientation, and General Dysfunction in a Clinical Population

Relationships between primary and secondary variables were examined with women who had met the criteria for either Bulimia Nervosa or Binge Eating Disorder. Study 2 had two parts. Study 2a repeated analyses from Study 1 where relationships between primary variables of emotion dysregulation, impulsivity, mindfulness and eating disorder symptoms were examined. Associations between primary variables and secondary variables of mood, attachment security and insecurity, and general dysfunction were also examined. Study 2b tested the impact of an 8-week mindfulness intervention on primary variables for the same women who met the criteria for an eating disorder.

Method

Participants

The 55 female participants in study 2a and 2b ranged from 19 to 67 years of age ($M = 39$ years, $SD = 12.66$). At the time of the intake interview, 20.6% of participants met DSM-IV criteria for BN, 32.5% met criteria for BED, and 46.8% of participants met criteria for ED-NOS. Most (62.8%) were in part-time or full-time employment with the remainder unemployed (1.7%), on pensions (8.5%), retired (3.4%), or a student (6.8%). The majority (73.3%) had received psychological treatment with 50% having received a mental health diagnosis including Depression or Major Depressive Disorder (27.6%), Eating Disorder (4.8%), Post-Traumatic Stress Disorder (4.8%) and Bipolar Affective Disorder (3.3%). Illegal or prescription drugs, including amphetamines, benzodiazapines,

and hypnotics were used monthly or more frequently by 26.9% of participants. Of these 33.3% used drugs daily, 25% weekly and 8.3% monthly. Additionally 17.1% consumed alcohol at harmful levels and would be considered alcohol dependent according to scores on the AUDIT. There were 31.7% of participants who had previous meditation experience with 38.1% having less than 1 year experience and 19.1% having greater than 1 year. Only 14.5% of these participants practiced weekly or daily.

Measures

Participants completed the same assessment packages as participants of Study 1. Missing values revealed that most items had less than 5% of data missing. Where participants missed some scale items, scale scores were computed from the valid items and pro-rated. For screening purposes only, participants were administered the Eating Disorders Examination and relevant sections (psychosis and borderline personality disorder) of the Structured Clinical Interview for DSM-IV. Cronbach's α 's for measures used for Study 2 and described in the Methods of Study 1 are as follows: emotion dysregulation (DERS) total $\alpha = .88$; impulsivity (UPPS) urgency $\alpha = .77$, premeditation $\alpha = .88$, perseverance $\alpha = .67$, sensation seeking $\alpha = .93$; eating disorder symptoms (EDI-3 Eating Disorder Risk Composite); $\alpha = .90$; mindfulness (FFMQ) $\alpha = .71$; general dysfunction (OQ-45) $\alpha = .85$; mood (depression $\alpha = .92$; anxiety $\alpha = .76$); insecure (anxious $\alpha = .88$; avoidant $\alpha = .66$); alcohol use (AUDIT) $\alpha = .82$; and drug abuse screening (DAST) $\alpha = .95$.

The Eating Disorders Examination (12.0D) (EDE; Fairburn & Cooper, 1993) is a semi-structured clinical interview that assesses the specific psychopathology of eating disorders over the previous 28 days. The EDE provides definitions of different types of

overeating (subjective bulimic episodes; objective bulimic episodes; and objective overeating episodes) allowing for distinctions between eating disorders including Binge Eating Disorder (Rizvi, Peterson, Crow, & Agras, 1999). The EDE provides frequency or severity ratings on individual items, has four subscales that are related to disturbances in cognitions and attitudes (shape concern, restraint, eating concern, and weight concern) and a global score. Subscale items are summed and divided by the number of items within that subscale. To obtain a global score, subscale totals are summed and divided by four. Alpha coefficients have been found to be adequate for each subscale: restraint (.75), weight concern (.70), eating concern (.68), and shape concern (.70), (Fairburn & Cooper, 1993). The EDE is able to discriminate eating disordered from non-eating disordered women (normal controls, dieters, and women with a BMI above 30; Fairburn & Cooper, 1992) is related to other measures of eating behaviour in expected ways, and is effective in diagnosing women with BED (Grilo, et al., 2003). Interrater reliability for four of the subscales are high with all spearman correlations between .90 and .99 (Rivzi et al., 1999). Good test-retest reliability has been reported for objective binge eating over a 6-14 day period with spearman correlations at .70 for objective bulimic episodes and .71 for objective bulimic days. Subjective episodes and days had unacceptable test-retest reliabilities (both .17 and non-significant) (Grilo, et al., 2003). Acceptable test-retest reliabilities for the four subscales over a four day period has been reported with spearman coefficients ranging from .71 to .76 (Rizvi, et al., 1999).

The Structured Clinical Interview for the DSM-IV- Axis I (SCID-I; Spitzer & Williams, 1984) *and Axis II* (SCID-II; First et al., 1995) is a semi-structured interview style diagnostic tool consistent with the Diagnostic and Statistical Manual of Mental

Disorders (4th edition). Reliability for all groups on the SCID I has been found to be excellent (interrater $\kappa = .84$ to 1.0; test-retest reliability $\kappa = .93$. Interrater reliability for the SCID II has been found to be moderate to high ($\kappa = .63$ to 1.0), and test-retest reliability excellent ($\kappa = .84$ to 1.0). Sensitivity has been found to be high for Axis I psychiatric disorders including psychosis (67%) and for Axis II personality disorders including borderline personality disorder (80%) (Schneider et al., 2004). It has been suggested that the SCID is an appropriate semi-structured interview to use for diagnoses of Axis I and II disorders (Zanarini, et al., 2000). For this study, only the SCID II Borderline Personality Disorder items were used in order to assess risk of self-harm and suicide rather than for diagnostic purposes.

Dissociative Experiences Scale (DES; (Steinberg, Rounsaville, & Cicchetti, 1991). The DES is a 28-item self-report measure that identifies dissociative symptoms and experiences. Two items from the DES were chosen to determine whether participants experienced dissociative episodes. These items were: “Do you ever have the experience of feeling that yourself, other people, objects, or the world around you aren’t real?”; and “Do you often have the experience of driving or riding in a car, bus, or train and suddenly realising that you don’t remember what has happened for part or all of the trip?”.

Clinical judgement was used as to the suitability of the participants for the program if they assented to either item. Adverse effects have been reported following intensive meditation such as impaired reality testing, confusion and disorientation (Shapiro, 1992), and mild dissociation, and recovered traumatic memories (Craven, 1989) which may or may not be more likely with participants who tend to dissociate. It has been suggested that individuals with pre-existing psychological concerns are more likely to

experience these negative effects and have concluded that they are typical of an anxious/neurotic cluster of symptoms (Morse, 1984; Perez-de-Albeniz & Holmes, 2000). Others suggest that these are normal perceptual changes from meditative practice experienced by predominantly healthy individuals which get labelled as psychiatric by the limited view of the Western psychiatric model (Kornfield, 1979). Although it is unclear whether the meditation component of the intervention would increase the likelihood of dissociative experiences for these participants, it was decided that individuals with a strong propensity for dissociation would be excluded, based on the ethical principal of harm prevention. The clinical supervisor was consulted where the potential for harm was unclear.

Procedure

Participants were recruited via referrals from eating disorder units, General Practitioners and/or media advertising (see Appendix 10). An initial telephone interview was conducted to determine treatment suitability based on inclusion (engaged in binge eating with or without purging) and exclusion criteria (younger than 18 years; not binge eating; had a current diagnosis of Anorexia Nervosa, or a BMI below 18.). If participants met criteria, they were invited to an intake interview at either the Gold Coast or Mt Gravatt campus of Griffith University conducted by one of the primary researchers. Researcher qualifications and experience will be discussed in 'Treatment Facilitators'.

During the intake interview, the SCID-IV and the EDE were administered, participants signed written consent for both treatment participation and agreement to be videotaped, and were given the pre-treatment assessment package to complete. The interview took approximately one hour. Participants who did not fulfil criteria or were

excluded based on imminent risk of harm or psychosis were provided with explanations as to their exclusion, and/or were referred to other agencies as necessary. Participants who met criteria and agreed to participate were randomly allocated to either the treatment or an 8-week waitlist conditions by drawing a sealed envelope containing the name of the condition they would enter. Waitlist participants entered treatment after the 8-week waiting interval. During this time they were contacted twice by a researcher to maintain contact, to remind them of the group commencement and to ensure they continued to fit the criteria for treatment.

The Mindfulness Treatment Program

The standardised treatment manual was developed by the two principal researchers with the primary aim of increasing mindfulness skills in order to address emotion regulation deficits and other maintaining factors in Bulimia Nervosa and Binge Eating Disorder (see Morgan, 2008 for additional findings).

The structure and length of the program was based on the original version and variations of the MBSR program (Huxter, 2005; Kabat-Zinn, 1990). This included eight 2-hour sessions conducted weekly with each session beginning with a 5-minute meditation. Meditation scripts were adapted from MBSR programs or from meditation retreats and workshops the researchers had attended. Meditations were followed by a review of homework, presentation of the session content, experiential exercises, and discussion. Exercises such as the Raisin Eating exercise were adapted from MBSR programs. Each session concluded with a guided meditation and homework setting. Unlike MBSR programs, the program did not include a half-day retreat. Table 6.1 outlines the weekly session content.

Table 6.1

Overview of Session Content

Session	Content
1	Address participant expectations Introduce Mindfulness and attitudes of Mindfulness (acceptance, non-judgement) Mindfulness of Breath Body Scan
2	Obstacles to practice Mindfulness of Thoughts Raisin Eating Exercise
3	Inevitable and Optional Suffering Mindfulness of Emotions
4	The Hungry Ghost and Control Freak (adapted from Kabatznick, 1998)
5	Mindfulness of Cravings Mindfulness of Thoughts and Emotions & their interactions
6	Acceptance of the present moment Letting Go and disengaging from cognitive and emotional elaboration
7	Loving Kindness
8	Relapse Prevention

Treatment facilitators. There were five program facilitators in total. Each had mindfulness experience and training through previous workshops with experienced facilitators as well as at least two years of ongoing mindfulness practice. All had attended at least one silent retreat. Each facilitator had at least three years clinical experience. Facilitators held either conditional or full registration with the Psychologists' Registration Board of Queensland, two were PhD postgraduate students (the developers of the Treatment Manual), two were Masters level post-graduate students in clinical psychology

at Griffith University, and the primary research supervisor was a PhD-level clinician, and Director of Postgraduate Clinical Training at Griffith University.

Supervision. The supervisor provided approximately 30 hours of clinical supervision and regularly reviewed videotapes of group sessions. She was available for debriefing and consultation as required.

Treatment. The program was conducted at Griffith University Psychology Clinic. Two facilitators conducted each group with one delivering mainly content and the other being responsible for group process issues and the debriefing of distressed participants. These roles were decided prior to the commencement of the session. Issues related to the individual group were discussed before and after each group either between the two facilitators or with the clinical supervisor.

An initial pilot study (n=5) was conducted with a treatment only group. Based on feedback from participants and observations by the co-facilitators and supervisor, minor changes to the manual were made. Changes included: additional time in each session was allocated to establishing participant's proficiency in the basics of mindfulness practice; Session 2 and 3 were combined to form a single session which allowed an entire session (Session 2) to be devoted to mindfulness of thoughts. The raisin eating exercise was moved from Session 1 to Session 2.

The participant manual and accompanying CD were distributed in session 1. Facilitators followed procedure outlined in the facilitator manual for all groups. Each session was videotaped. Participants completed assessment packages at Week 4 and again at Week 8. Participants attended a two hour 'booster' session at one month post-treatment at which they completed a follow-up assessment package.

Results

Study 2a: Relationships between Primary Variables of Emotion Dysregulation, Impulsivity, Mindfulness and Eating Disorder Symptoms in a Clinical Population and Associations with Secondary Variable of Attachment Insecurity, Mood and General Dysfunction.

Missing Data, Skew, Transformations and Univariate Outliers

Hypotheses were tested using bivariate correlations, regression, and paired t-tests. Prior to analysis, data were inspected for missing values. Data were examined for skew, outliers, and violations of assumptions. Three univariate outliers were found for the mood composite. However, running analyses with these participants removed made little difference to results. Subsequently, all analyses reported below include all participants who had complete data.

Descriptive Analysis

Means and standard deviations measures are presented in Table 6.2 after combining some measures as described in Study 1. Categorical attachment styles were: fearful (40%), preoccupied (20%), dismissing (14.5%) and secure (25.5%).

Table 6.2

Means and Standard Deviations of Variables

Variable	<i>M</i>	<i>SD</i>
Emotion Dysregulation	106.31	23.12
Mood	6.87	4.22
Insecure	4.06	1.18
Secure	3.30	2.03
Mindfulness	106.67	21.24
Impulsivity	112.73	15.81
Urgency	37.29	5.31
Eating Disorder Symptoms	72.67	14.44
General Dysfunction	81.31	24.03

Note: Emotion Dysregulation = Difficulties with Emotion Regulation Scale. Mood – DASS Depression & Anxiety combined. Insecure – anxiety and avoidance subscales combined. Secure = Secure Attachment. Mindfulness – Five Factor Mindfulness Questionnaire. Impulsivity = UPPS Impulsivity Scale. Urgency – Urgency Facet of Impulsivity Scale. Eating Disorder Symptoms – Eating Disorder Risk (EDI-3). General Dysfunction – OQ-45 Outcomes Questionnaire.

Intercorrelations between continuous measures.

Correlations between measures are shown in Table 6.3. As expected individuals who reported greater emotion dysregulation also reported more problems with impulsivity, urgency, mood, and general functioning. Those with more emotion dysregulation had more eating disorder symptoms, were less mindful, and reported greater attachment insecurity. Correlations ranged from $r = .44$ to $r = -.78$.

Table 6.3

Bivariate Correlations between All Variables (N = 55)

Variables	1	2	3	4	5	6	7	8	9
1. Emotion Dysregulation	-	.62**	.41**	-.21	-.78**	.45**	.62**	.44**	.56**
2. Mood		-	.38**	-.14	-.45**	.20	.34*	.39**	.74**
3. Insecure			-	-.39**	-.35**	.35**	.28*	.44**	.49**
4. Secure				-	-.21	-.16	-.05	-.08	-.15
5. Mindfulness					-	-.43**	-.50**	-.48**	-.53**
6. Impulsivity						-	.61**	.34**	.32**
7. Urgency							-	.41**	.36**
8. Eating Disorder Symptoms								-	.41**
9. General Dysfunction									-

Note: Emotion Dysregulation = Difficulties with Emotion Regulation Scale. MOOD – DASS Depression & Anxiety combined. INSECURE – anxiety and avoidance subscales combined. SECURE = Secure Attachment. Mindfulness – Five Factor Mindfulness Questionnaire. Impulsivity = UPPS Impulsivity Scale. URGENCY – Urgency Facet of Impulsivity Scale. Eating Disorder Symptoms – Eating Disorder Risk (EDI-3). General Dysfunction – OQ-45 Outcomes Questionnaire.

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

Individuals who reported being more mindful had fewer problems with mood, general functioning and both urgency and impulsivity. They were lower in attachment insecurity and had fewer eating disorder symptoms, r 's ranged from $-.35$ to $-.78$ (see Table 6.3). As expected, individuals who reported more attachment insecurity reported greater difficulties with all correlates of emotion dysregulation, r 's ranged from $.28$ to $.49$. Contrary to expectations, there were no significant correlations between attachment

security and other variables, although all relationships were in expected directions.

Individuals who reported more eating disorder symptoms reported having greater difficulties with mood ($r = .39$), general functioning ($r = .41$), and both urgency ($r = .41$) and impulsivity ($r = .34$), while being significantly less mindful ($r = -.48$).

In summary, emotion dysregulation was related to all variables in expected ways. With greater emotion dysregulation, individuals were also more likely to have other difficulties including reporting more mood problems, more problems with general functioning, more impulsivity, and behaviours and cognitions that indicated more eating disorder symptoms. As expected being more mindful was negatively associated with measures indicating psychological or emotional difficulty and positively correlated with measures of emotional or psychological health. However, contrary to expectations and theory, being more mindful was not significantly associated with a reported secure attachment orientation. Having more eating disorder symptoms was, as expected, associated with difficulties in all domains. However, contrary to expectations, there was a small and non-significant association between eating disorder symptoms and secure attachment ($r = -.08$). Contrary to expectations, individuals reporting a secure attachment orientation were not at significantly reduced risk for an eating disorder.

Multivariate Analyses of Emotion Dysregulation. Regression analyses were conducted to determine the unique association of variables with emotion dysregulation. Only variables with a significant correlation with emotion dysregulation were entered as independent variables in these regression models. Two regressions were conducted. The first included the urgency facet of impulsivity and the second replaced urgency with the

total impulsivity score. Analyses were similar to those reported in Study 1 (see Chapter 5).

For both regression models and for all other regression models below tolerance values and (VIF) were investigated to assess multicollinearity. Multivariate outliers were assessed by inspection of partial regression plots, Mahalanobis Distance, Cooks distance and leverage values. No problems with multicollinearity were found. Outliers will be discussed separately for each model.

In the first model, the independent variables accounted for 73% of the variance in emotion dysregulation, $F(6,48) = 24.88, p < .001$ (see Table 6.4). Mindfulness, mood and urgency were all significant unique correlates of emotion dysregulation with mindfulness accounting for the largest amount of variance. The direction of associations showed that individuals with greater emotion dysregulation reported being less mindful, and had more difficulties with mood, and greater urgency. When controlling for other variables, general dysfunction and eating disorder symptoms were not significantly associated with emotion dysregulation.

Table 6.4

Results of Regressing Emotion Dysregulation on Mindfulness, Attachment Insecurity, Eating Disorder Symptoms, Mood, General Dysfunction, and Urgency (N=55)

Variables	R^2	B	$SE\ B$	β
Mindfulness		-.58	.10	-.53***
Mood		1.92	.59	.35**
Urgency		1.14	.27	.26**
General Dysfunction		-.10	.11	-.11
Eating Disorder Symptoms		-.06	.14	-.04
Insecure		1.78	1.62	.09

Note. $R^2 = .73$, $F(6, 48) = 24.88$, $p < .001$.

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

The second regression model again examined the unique association of variables with emotion dysregulation but included the total impulsivity score rather than the urgency facet. Results were quite similar (see table 6.5). The model explained 72% of the variance in emotion dysregulation, $F(6,48) = 20.80$, $p < .001$. Mindfulness and mood were the only significant unique correlates of emotion dysregulation, with mindfulness again accounting for the greatest variance. In both models (see Tables 6.4 and 6.5) a single multivariate outlier was identified and analyses were repeated after excluding this participant. The results after removal were not notably different from the results reported here.

Table 6.5

Results of Regressing Emotion Dysregulation on Mindfulness, Attachment Insecurity, Mood, General Dysfunction, Impulsivity, and Eating Disorder Symptoms (N=55)

Variables	R^2	B	$SE\ B$	β
Mindfulness		-.63	.11	-.58***
Mood		2.15	.63	.39**
General Dysfunction		-.11	.12	-.12
Impulsivity		.20	.13	.14
Eating Disorder Symptoms		-.01	.14	-.01
Insecure		1.63	1.77	.08

Note. $R^2 = .72$, $F(6,48) = 20.80$, $p < .001$.

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

Summary of findings. As was found in Study 1, mindfulness had the greatest unique association with emotion dysregulation when controlling for all other variables. When examining the unique correlates of emotion dysregulation in the first regression model, mindfulness, urgency and mood were significantly associated with emotion dysregulation. These variables were also significant unique correlates of emotion dysregulation in Study 1. The direction of associations indicated that individuals in Study 1 who reported more emotion dysregulation also reported more difficulties with general functioning and more eating disorder symptoms. In this second study of individuals with women who met criteria for an eating disorder, individuals reporting more emotion

dysregulation also reported more impulsivity, greater attachment insecurity but less difficulties with general functioning when controlling for other variables.

Multivariate Analyses of Emotion Dysregulation and Impulsivity.

As was done in Study 1, two regression models were estimated to determine the unique associations of the subscales of impulsivity and the subscales of emotion dysregulation. The first model regressed the total emotion dysregulation score (DERS) on the UPPS subscales of urgency, lack of perseverance, lack of premeditation, and sensation seeking (see Table 6.6). The second model regressed the total impulsivity scores on the emotion dysregulation subscales of non-acceptance of emotion, emotion regulation goals, impulse control, awareness of emotions, access to emotion regulation strategies and emotional clarity (see table 6.7). No multivariate outliers were identified in either model.

In the first model, urgency was the only significant unique correlate of emotion dysregulation (see Table 6.6). The direction of associations indicated that individuals who reported being more emotionally dysregulated also reported having less pre-planning, more sensation seeking, and less perseverance. There were no identified outliers.

Table 6.6

Results of Regressing Emotion Dysregulation (DERS) on UPPS Impulsivity Subscales
($N=55$)

Variables	R^2	B	$SE\ B$	β
Urgency		2.67	.53	.61**
Lack of Perseverance		.25	.54	.06
Lack of Premeditation		.21	.60	.36
Sensation Seeking		.35	.31	.13

Note. $R^2 = .25$, $F(6,48) = 9.47$, $p < .001$.

* $p < .05$. ** $p < .001$.

When urgency was the dependent variable, the independent variables accounted for 49% of the variance $F(6,48) = 9.47$, $p < .001$ (see Table 6.7). Difficulties engaging in goal directed behaviour, impulse control difficulties and limited access to emotion regulation strategies were all significant unique correlates of urgency. The direction of associations indicated that women who reported more urgency, also had more trouble controlling their impulsive behaviours, and were less able to act in accordance with desired goals. Surprisingly there was also a negative association between urgency and limited access to emotion regulation strategies indicating that women who were less limited in their access to emotion regulation strategies (i.e. had more access to emotion regulation strategies) were more likely to act rashly in response to emotional distress. As it is counterintuitive to have more access to emotion regulation strategies when reporting more dysregulation in other domains, a series of regressions were conducted with various

combinations of emotion dysregulation variables to determine if results were empirically accurate. Limited access to emotion regulation strategies was not a significant unique contributor in further models and associations were in expected directions.

Table 6.7

Results of Regressing the Urgency Subscale of Impulsivity on Emotion Dysregulation (DERS) Subscales (N=55)

Variables	R^2	B	$SE\ B$	β
Non Acceptance		.27	.12	.28
Difficulties with Goals		.37	.18	.32*
Difficulties with Impulses		.48	.16	.53**
Lack of Awareness		.04	.13	.04
Limited Strategies		-.27	.13	-.35*
Lack of Clarity		.06	.17	.05

Note. $R^2 = .49$, $F(6,48) = 9.47$, $p < .001$.

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

When lack of premeditation was the dependent variable in a similar regression model, the model was not significant. The emotion dysregulation subscales did not explain a significant amount of variance in lack of premeditation. Similarly, when sensation seeking was the dependent variable, the model was not significant. When lack of perseverance was the dependent variable the independent variables accounted for 15% of the variance $F(6,48) = 2.63$, $p < .05$. Difficulties engaging in goal directed behaviour

was the only significant unique contributor ($\beta = .69$; $p < .01$). Women who reported a lack of perseverance also reported having trouble engaging in goal directed behaviours when upset.

Summary of findings. As expected, women who reported being more emotionally dysregulated also reported acting more rashly when emotionally distressed (urgency). Unlike results from Study 1, urgency was the only unique correlate of emotion dysregulation. When examining the contribution of emotion dysregulation to urgency, only three factors of emotion dysregulation were significant. Women who reported acting more rashly when distressed (urgency) reported more difficulties engaging in goal directed behaviours, and had more impulse control difficulties. Results indicated that emotion dysregulation did not contribute significantly to other facets of impulsivity (lack of premeditation and sensation seeking) and only difficulties engaging in goal directed behaviours when upset was associated with the impulsivity facet lack of perseverance.

Multivariate Analyses of Eating Disorder Symptoms.

Two regressions were used to test the unique correlates of eating disorder symptoms. The first regression model examined the unique association of urgency and other variables to eating disorder symptoms using the composite measure from the EDI-3 (see Table 6.8). The second model was the same but replaced urgency with the total impulsivity score (see Table 6.9). Only variables that had a significant bivariate correlation with eating disorder symptoms were entered in the model as independent variables. These variables included emotion dysregulation, urgency, general dysfunction, mood, insecure attachment, mindfulness, and impulsivity. As with previous regressions, urgency was examined in a separate model to the total impulsivity score.

In this first model of EDI-3 eating disorder symptoms, the independent variables accounted for 30% of the variance in risk for an eating disorder, $F(6,48) = 3.47, p < .01$. However, despite a significant model, there were no significant unique correlates of eating disorder symptoms. Due to the high correlations between mindfulness and emotion dysregulation measures, further regressions were conducted first excluding mindfulness from the model then excluding emotion dysregulation. Results indicated that both mindfulness and emotion dysregulation were significant unique correlates of eating disorder symptoms after controlling for other variables $\beta = -.35$ (mindfulness) and $\beta = 2.02$ (emotion dysregulation) both $p < .05$. After controlling for other variables, the direction of associations showed that individuals with more eating disorder symptoms were less mindful and also had more problems with emotion dysregulation. Hence, it appears that the lack of unique correlates in Table 6.8 was due to suppression.

One multivariate outlier was identified, removed and the analysis repeated. The results after removal of this participant did not differ substantially to the results reported.

The results were similar in the second model, which replaced the impulsivity subscale of urgency with the total impulsivity score (see Table 6.9). This model accounted for 29% of the variance in eating disorder symptoms $F(6,48) = 3.24, p < .01$. Again there were no significant unique correlates of eating disorder symptoms and follow-up regressions were conducted. Mindfulness and emotions dysregulation were again the only significant unique contributors to eating disorder symptoms after testing each separate from the other and controlling for all other variables, $\beta = -.31$ (mindfulness) and $\beta = .25$ (emotion dysregulation), both $p < .05$.

Table 6.8

Results of Regressing EDI Eating Disorder Symptoms on Emotion Dysregulation (DERS), Mindfulness, Attachment Insecurity, Mood, General Dysfunction, and Urgency (N=55)

Variables	R^2	B	$SE B$	β
Mindfulness		-.22	.14	-.32
Emotion Dysregulation		-.06	.15	-.10
Attachment Insecurity		.79	1.73	.06
Urgency		.60	.42	.22
General Dysfunction		.04	.12	.07
Mood		.53	.68	.16

Note. $R^2 = .30$, $F(6,48) = 3.47$, $p < .01$.

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

As in the first model of eating disorder symptoms, one multivariate was identified, removed, and the analysis repeated. The results after removal of the one participant were similar to results reported.

Table 6.9

Results of Regressing Eating Disorder Symptoms on Emotion Dysregulation (DERS), Mindfulness, Attachment Insecurity, Mood, General Dysfunction, and Impulsivity (N=55)

Variables	R^2	B	$SE\ B$	β
Mindfulness		-.21	.14	-.30
Emotion Dysregulation		-.01	.14	-.01
Attachment Insecurity		.52	1.78	.04
General Dysfunction		.04	.12	.06
Mood		.56	.70	.16
Impulsivity		.13	.13	.15

Note. $R^2 = .29$, $F(6,48) = 3.24$, $p < .01$.

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

Summary of findings. Both mindfulness and emotion dysregulation were the only unique significant correlates of eating disorder symptoms. This is in contrast to the results from Study 1, where mindfulness was not a significant unique correlate. Emotion dysregulation remained an important contributor to eating disorder symptoms for both clinical and non-clinical populations.

Associations between Emotion Dysregulation Subscales, Mindfulness, and Eating Disorder Symptoms.

In order to further understand the relationship between emotion dysregulation, mindfulness, and eating disorder symptoms, correlations between subscales of the DERS, Five Factor Mindfulness Questionnaire, and the EDI-3 Eating Disorder Risk composite were examined (see Table 6.10).

Bivariate correlations between emotion dysregulation and eating disorder symptoms. Women in Study 2 who reported more problems with bulimic behaviour reported being more generally emotionally dysregulated. All facets of emotion dysregulation were significantly and positively related to the bulimia subscale. Correlations ranged from .28 to .38. Individuals who reported being dissatisfied with their body also reported being non-accepting of their emotional responses ($r = .34$; DERS Non-accept) and having limited access to emotion regulation strategies ($r = .35$; DERS Strategies).

Bivariate correlations between mindfulness and eating disorder symptoms. When correlations among Study 2 participants were examined, those who reported being more mindful also reported having fewer problems with bulimia, and to a lesser extent having less dissatisfaction with their body. Those who reported more problems with bulimia were less able to observe sensations, perceptions, and feelings ($r = -.36$; M Observe), were more likely to be on ‘automatic pilot’ and be distracted and unfocused ($r = -.42$; M-Aware), and were less able to label and accurately describe thoughts, sensations, and feelings ($r = -.29$; M Label). All correlations can be seen in Table 6.10. Individuals who reported being more judgemental of experience (M-Non-Judge) also reported having greater dissatisfaction with their body ($r = .33$).

Table 6.10

Study 2 Correlations between subscales of Emotion Dysregulation, Mindfulness, and Eating Disorder Symptoms (N = 55)

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14
1. DERS Non-Acc	.47**	.47**	.02	.52**	.48**	-.41**	-.01	-.40**	-.27*	-.69**	.28*	.21	.34*
2. DERS Goals		.71**	.05	.63**	.55**	-.59**	-.22	-.51**	-.35**	-.32*	.29*	.05	.18
3. DERS Impulsivity			-.02	.78**	.43**	-.59**	.13	-.52**	-.19	-.45**	.33*	.11	.24
4. DERS Awareness				.13	.44**	-.22	-.52**	-.26	-.41**	.05	.32*	.10	-.04
5. DERS Strategies					-.53**	-.49**	-.17	-.37**	-.35**	-.53**	.38**	.19	.35**
6. DERS Clarity						-.40**	-.27	-.65**	-.56**	-.43**	.30*	.16	.24
7. M NonReact							.38**	.49**	.20	.38**	-.23	-.04	-.25
8. M Observe								.25	.33*	.09	-.36**	-.05	-.03
9. M Aware									.44**	.36**	-.42**	-.12	-.21
10. M Label										.17	-.29*	-.26	-.33*
11. M NonJudge											-.23	-.23	-.33*
12. EDI Bulimia												.69**	.67**
13. EDI Drive for Thinness													.82**
14. EDI Body Dissatisfaction													

Note: DERS = Difficulties with Emotion Regulation Scale. Subscales: Non-Acceptance, Goals, Impulsivity, Awareness, Strategies, Clarity. FFMQ = Five Factor Mindfulness Questionnaire. Subscales: Non-React, Observe, Awareness, Label, Non-Judgement. EDI = Eating Disorder Inventory 3. Subscales: Bulimia, Drive for Thinness, Body Dissatisfaction.

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

Bivariate correlations between mindfulness and emotion dysregulation.

Individuals who reported being less accepting of their emotional responses (DERS Non-accept), had less access to emotion regulation strategies (DERS Strategies; $r = .52$), had more difficulty engaging in goal directed behaviour when upset (DERS Goals; $r = .47$), and had less clarity about their emotions (DERS Clarity; $r = .48$). They also reported being more reactive to inner experience (M Non-react; $r = -.41$), less aware of their environment and inner experience (M Aware; $r = -.40$), were less able to describe their thoughts and feelings (M Label; $r = -.27$) and were more judgemental of experience (M Non-judge; $r = -.69$). Individuals who reported being more emotionally aware (DERS Aware) also reported being more observant of sensations, perceptions and feelings (M Observe) ($r = -.52$). Being emotionally aware (DERS Aware) was not significantly associated with being less judgemental (M Non-judge). Individuals who reported being more impulsive (DERS Impulsive) also reported being more on ‘automatic pilot’ ($r = -.52$; M Aware), more judgemental of experience ($r = -.45$; M Non-judge), and more reactive to inner experience ($r = -.59$; M Non-react).

Summary of findings. Bulimic behaviours of participants in Study 2 were more strongly and significantly associated with emotion dysregulation than drive for thinness and body dissatisfaction. However, all relationships were small to moderate. To compare with Study 1, associations between subscales of emotion dysregulation and subscales of eating disorder symptoms were more consistent with most associations being in the moderate range across most subscales. Subscales of mindfulness were related to eating disorder subscales in expected ways in the non-clinical group and again had the strongest relationships with bulimia rather than drive for thinness or body dissatisfaction in the

clinical group. Mindfulness was related to emotion dysregulation subscales in expected ways, however, the mindfulness subscale 'observe' was only significantly related to one DERS subscale (DERS awareness) in both the clinical and non-clinical groups. Being observant of sensations, thoughts and feelings was associated with more emotional awareness but not with other facets of emotion regulation.

Results

Study 2b: Paired T-Tests Comparing Pre-Treatment to Post-Treatment Measures for the Mindfulness Intervention with Women with Bulimia Nervosa and Binge Eating Disorder

Initially, 63 women met criteria for this study but seven were excluded from analyses due to excessive missing data. An additional six women were missing data on pre-treatment data on an entire scale, so were not included in the analyses of Study 2. Ten participants who had not completed all post-treatment measures were excluded from analyses involving subscales other than the UPPS and EDI-3. The final sample size totalled 40 with complete pre-to-post data and 50 for analyses involving the UPPS and EDI-3.

Paired t-tests were conducted to compare pre-treatment to post-treatment scores (see Table 6.11). Outcome measures included both primary (emotion dysregulation, impulsivity, mindfulness, and eating disorder symptoms) and secondary measures (general dysfunction and mood). There were significant improvements on all variables except impulsivity. There were significant decreases in emotion dysregulation and in the impulsivity facet urgency. The eating disorder symptoms decreased significantly and there were significant decreases to mood problems from pre to post treatment. General functioning improved and mindfulness increased.

Table 6.11

Results of Paired t-tests for Comparing Pre-Treatment to Post-Treatment Measures

	Pre-Tx	Post-Tx	t(df)
Variables	M (SD)	M (SD)	
EmotionDysregulation	106.07 (23.64)	83.22 (25.51)	4.72 (39)**
Impulsivity	112.94 (16.04)	111.96 (19.06)	0.29 (49)
Urgency	36.61 (4.92)	32.24 (5.40)	5.16 (49)**
ED Symptoms	79.90 (14.35)	49.39 (24.39)	6.27 (49)**
Mindfulness	109.49 (22.18)	136.07 (25.98)	-5.27 (39)**
General Dysfunction	78.95 (25.43)	55.41 (26.20)	4.32 (39)**
Mood	6.45 (4.15)	3.65 (3.79)	2.80 (39)**

Note: Emotion Dysregulation = Difficulties with Emotion Regulation Scale, Impulsivity = Impulsivity

Scale. Urgency – Urgency Facet of Impulsivity Scale. ED Symptoms – Eating Disorder Risk (EDI-3).

Mindfulness – Five Factor Mindfulness Questionnaire. General Dysfunction – Outcomes Questionnaire.

Mood = Mood Composite (DASS depression & anxiety)

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

Discussion Study 2a and 2b

The first aim of Study 2a was to test hypothesised relationships between primary variables (emotion dysregulation, impulsivity, mindfulness, eating disorder symptoms) and secondary variables (mood and general dysfunction) in a clinical sample. The role of attachment insecurity in emotion dysregulation and eating disorder symptoms was also explored. The second aim of Study 2 was to test the efficacy of an 8-week mindfulness intervention for individuals assessed to have significant eating disorder symptoms. Important intervention outcomes were emotion dysregulation, impulsivity, mindfulness, eating disorder symptoms, mood, and general dysfunction.

Emotion Dysregulation

Emotion dysregulation has often been described as being central to poor psychological and general functioning, and is associated with a range of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Bradley, 2003; Eftekhari, Zoellner, & Vigil, 2009). This assertion was largely supported by the results from this study. Women from this study met the criteria for either bulimia nervosa or binge eating disorder. They reported being in the clinical range for eating disorder symptoms, and reported being in the clinical range on measures where there were clinical cut-offs (UPPS Impulsivity Scale, Eating Disorder Inventory-3, and the Outcome Questionnaire), and were closer to the means of clinical samples than non-clinical samples in measures with no established clinical cut-offs (i.e. Difficulties with Emotion Regulation Scale, the Five Facet Mindfulness Questionnaire, and the Experiences in Close Relationships Questionnaire Revised). The women who reported being emotionally dysregulated were also more impulsive, had more problems with mood and general functioning, and reported greater

attachment insecurity. These findings are consistent with previous research that has found women with an eating disorder with a binge component have high rates of mood disorders and neuroticism, difficulties with interpersonal functioning, poor impulse control, and high rates of insecure attachment orientations (Cassin & von Ranson, 2005; Orzolek-Kronner, 2002; Pearlstein, 2002; Polivy & Herman, 2002; Wilfley, et al., 1993).

Mindfulness and emotion regulation had very strong relationships in both correlations and regressions, with mindfulness being the largest unique contributor in explaining variance in emotion dysregulation when controlling for all other variables. This lends credence to the use of mindfulness interventions for disorders with an emotion dysregulation component. It would appear that mindfulness may provide a protective factor against emotion dysregulation and other associated problems. These results from the clinical sample were consistent with those from the non-clinical sample, indicating that the nature of these relationships remains fairly stable across populations.

More specifically, mindfulness was associated with emotion dysregulation in the following ways. All facets of mindfulness except for *observe*, were moderately to highly negatively correlated with emotion dysregulation factors, again supporting that mindfulness is the antithesis of emotion dysregulation and could therefore be used as an emotion regulation strategy. *Observe* has been found to have non-significant relationships with emotion dysregulation and related constructs in the past, with these non-significant relationships attributed to *observe* potentially needing greater length of meditation practice to develop (Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006). The mindfulness facet *non-react* had the strongest relationships with all factors of emotion dysregulation, indicating that a non-reactive stance is essential to regulating emotions.

Developing a non-reactive stance may thus be a factor that is important to highlight in treatment interventions. Results further indicated that the more acceptance, (as measured by DERS Acceptance and M Non-judgement) an individual has of emotional experience, the less reactive (M Non-react) they are, and the more they have access to emotion regulation strategies (DERS Strategies).

Emotion dysregulation, urgency, and impulsivity. Emotion dysregulation and impulsivity are frequently comorbid in people with eating disorders such as bulimia nervosa and binge eating disorder, however, the nature of the relationship between them had not been explored (Claes, Vandereycken, & Vertommen, 2005; Goodsitt, 1983; Reindl, 2001). Study 2 found that individuals who were more emotionally dysregulated were also more impulsive, but only urgency and lack of perseverance were uniquely associated with emotion dysregulation with urgency having the strongest relationship. There have been suggestions after a factor analysis on subscales of the UPPS Impulsivity Scale that urgency and sensation seeking are distinct constructs and should not be included under the banner of impulsivity (Smith et al., 2007). For example, factor analysis indicated that lack of planning and lack of persistence were two distinct facets of one broader trait whereas urgency and sensation seeking were very modestly related with each other and the planning/persistence factor. The traits were related to different aspects of risky behaviours with sensation relating to the frequency and urgency the problem levels of risky behaviours (Smith, et al., 2007). Strong relationships between urgency and emotion dysregulation support urgency being the impulsive expression of emotion dysregulation (Fischer, Smith, Spillane & Cyders, 2005).

The current findings support previous research in which findings suggest that urgency, and not necessarily other facets of impulsivity, is uniquely related to bulimia and to problem binge eating (Fisher, Smith, Spillane, & Cyders, 2005; Fischer, Anderson, & Smith, 2004). This was consistent for both clinical and non-clinical populations. As the definition of urgency states that urgency results in impulsive behaviour while emotionally dysregulated, these results suggest that bulimia and binge eating disorder may be better conceptualised from an emotion dysregulation and trait urgency model as opposed to one of impulsivity (Heatherton & Baumeister, 1990; Reindl, 2001; Trattner-Sherman, & Thomas, 1990).

When exploring the unique correlates of urgency, it was found that emotion dysregulation factors *impulse control difficulties* and *difficulties engaging in goal directed behaviour* were both significant predictors. Models including impulsivity facets *sensation seeking* and *lack of premeditation* were not significant, and only *difficulty engaging in goal directed behaviour* when upset predicted *lack of perseverance*. This suggests that for women with binge eating disorders, emotion dysregulation is expressed mainly through rash actions when upset which is consistent with previous research (Anderson & Smith, 2001; Fischer, Anderson, & Smith, 2004; Fischer, Smith, Spillane, & Cyders, 2005). This also suggests that interventions that address emotion dysregulation should be effective in treating urgency and therefore rash action (impulsivity). If impulse control difficulties arise out of emotion dysregulation, which prevents the eating disordered individual from engaging in goal directed behaviours (refraining from bingeing when striving for the thin ideal), then developing skills in emotional regulation and tolerance could theoretically limit or prevent rash action.

Mindfulness

Mindfulness interventions have been suggested as being a potential solution to disorders of emotion dysregulation (Mobbs, Crepin, Thiery, Golay, & Van der Linden, 2010; Sloan & Kring, 2007). Consistent with findings Study 1 (non-clinical), mindfulness was found to be highly negatively correlated with emotion dysregulation and had the strongest unique relationship with emotion dysregulation when controlling for all other variables. These results indicate that mindfulness may provide a protective factor against emotion dysregulation, or may in fact, be an emotion regulation skill or strategy and would therefore be an important inclusion in treatment for disorders of emotion dysregulation, including bulimia and binge eating disorder.

Further support for mindfulness interventions being valuable for treating bulimia and binge eating disorder was found in these results. After considering multiple associations and models, results indicated that individuals who were more mindful had a reduced risk for an eating disorder. Mindfulness emerged as an important protective factor for eating disorder symptoms after controlling for other variables including urgency and emotion dysregulation which have both been reported as being integral to the maintenance of binge eating disorders (Fischer, Anderson, & Smith, 2004; Whiteside & Lynam, 2005). It appears that not only does mindfulness provide a protective factor against emotion dysregulation, but also against eating disorder symptoms. Previous research has found similar results where increased mindfulness was associated with decreases in poor body image and body dissatisfaction (Baer, Fischer, & Huss, 2006). This further supports the utilisation of mindfulness interventions for individuals with eating disorders.

While many have found that mindfulness is associated with effective emotion regulation (Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006; Jiminez, Miles, & park, 2010), and could therefore be useful for disorders of emotion dysregulation, others have found that some fundamental aspects of mindfulness based treatments are not effective. For example, in a recent meta-analysis, acceptance based emotion regulation strategies were found to have small effect sizes (Aldao, Nolen-Hoeksema, & Schweizer, 2009) and others have suggested that awareness may only be beneficial under conditions where the individual can already employ emotion regulation strategies (Sloan & Kring, 2007). Although not examining the ability of various elements of mindfulness to affect emotion dysregulation or disordered eating, these results give some indication of the relationship that these facets of mindfulness have with emotion dysregulation and eating disorder symptoms. Results from this study indicated that more acceptance and greater awareness were each associated with having more access to emotion regulation strategies, more ability to engage in goal directed behaviours despite being upset, and less impulsivity. This was true for both clinical and non-clinical groups. This indicates that the awareness and acceptance aspects of mindfulness may actually be beneficial for addressing disorders of emotion regulation, and specifically those where impulsivity is comorbid such as bulimia and binge eating disorder.

It has been suggested that cognitive based treatments alone may not be effective in treating people with eating disorders (Blouin et al., 1994) but it may also be possible that mindfulness interventions may not address all aspects of maintaining factors for eating disorders and that emotion dysregulation is only related to certain aspects of disordered eating. Results from this study indicated that emotion dysregulation, and

mindfulness subscales were mainly related to the bulimia subscale rather than all subscales that fall under the Eating Disorder Risk Composite (i.e. drive for thinness and body dissatisfaction of the EDI-3 only). The only other significant correlations were those between body dissatisfaction and both non-acceptance (of emotions) and strategies (limited emotion regulation strategies). This indicates that it is mainly bulimic behaviours only that are affected by emotion dysregulation, and to a much lesser extent drive for thinness and body dissatisfaction. These other central features of eating disorders (body dissatisfaction and drive for thinness; Fairburn, Cooper & Shafran, 2002) may not be as driven by dysregulated emotional states as bingeing and purging. Models of eating disorders from an emotion regulation perspective suggest that bingeing may provide a means of escaping aversive self-awareness and intolerable emotional states such as guilt, shame, anger, loneliness and sadness (Heatherton & Baumeister, 1991; Reindl, 2001). Purging has been hypothesised as expelling the intolerable emotions that have been ‘stuffed’ through bingeing (Reindl, 2001). Study 2 results largely support that it is the bulimic behaviours and cognitions that are more driven by dysregulated emotions. They further suggest that additional components to mindfulness treatments need to be included to address cognitions related to body dissatisfaction and drive for thinness.

When examining mindfulness facets, it was found that mindfulness facets were more strongly associated with bulimia than with drive for thinness and body dissatisfaction. Subscales with the highest correlations were those relating to mindfulness subscales *aware* (difficulty being in the present moment and being easily distracted), and *label* (the inability to put emotions into words), that in the reverse could indicate a tendency towards alexythimia and dissociation. Baer, Smith, Hopkins, Krietmeyer, &

Toney, (2006) found high negative correlations between label and alexithymia, and aware and dissociation with moderate correlations for the reverse relationships. Women with binge eating disorders also tend to have comorbid mood disorders such as alexithymia (Larson & Johnson, 1985) and have been reported as bingeing in dissociated states (Rodreguez-Srednicki & Twaite, 2006). In treatments for women with bulimia, attention to increasing awareness of emotions and the ability to label them would therefore appear to be necessary.

The significant associations between body dissatisfaction and the two emotion dysregulation subscales may indicate that individuals who are non-accepting of their physical appearance may also be non-accepting of many aspects of themselves. This may then serve a ruminative function, where the individual focuses on the source of their dissatisfaction (i.e. their body shape), feels more dissatisfied and becomes less accepting of themselves. Literature on private self-consciousness supports this idea where it has been found that individuals who have high private self-consciousness, and focus on their internal private events in a ruminative way, also tend to have high levels of psychological distress, heightened attention to mood, high neuroticism, and greater dissatisfaction with themselves (Trapnell & Campbell, 1999). With limited emotion regulation strategies the individual does not have the tools to be able to distract from the judging thoughts, thereby becoming more and more dysregulated (Eftekhari, Zoellner, & Vigil, 2008).

Emotion dysregulation and mindfulness were distinctly related to the bulimia subscale in the clinical, but not in the non-clinical group. Relationships were more consistent for all eating disorder risk subscales in the non-clinical sample. Again, results cannot be directly compared but the pattern of relationships was distinctly different. The

reason for these discrepancies is not clear and should be examined in future research.

Drive for thinness and body dissatisfaction have been posited as being a risk factor in the development of an eating disorder (Fairburn, et al., 2003). In a non-clinical population, where individuals have not developed an eating disorder, there may be stronger inverse relationships with protective factors such as mindfulness and emotion regulation than in an eating disordered population where symptoms related to the disorder itself have become more distressing. Future research could examine changes to the relative importance of risk factors for an eating disorder as the disorder progresses.

Emotion Dysregulation, Mindfulness, and Eating Disorder Risk

Bulimia has been suggested as being a disorder characterised by a desire for control and an inability to maintain control (Milligan & Waller, 2000). The DERS factor *impulsivity* was only significantly positively related to the bulimia subscale of the EDI-3. The DERS factor impulsivity has items that reflect feeling out of control and being unable to stay in control of behaviours when upset, however the focus of items is on control (my emotions feel out of control, I can't control my behaviours, when I'm upset I feel out of control). Being more mindful was associated with less impulsivity, which suggests that mindfulness is providing a protective factor against feeling out of control. Mindfulness also appeared to provide assistance with acting in accordance with desired goals (DERS goals) which is essentially the cognitive and behavioural aspect of emotion dysregulation (when I'm upset I have difficulty getting work done; difficulty focusing on other things, difficulty concentrating). Mindfulness skills such as single pointed focus and present moment awareness may therefore assist with the cognitive and behavioural

aspects of emotion dysregulation by preventing the overwhelm that leads to inability to concentrate and act in desired ways (Diamond & Aspinwall, 2003; John & Gross, 2003).

Attachment Orientation

Mentalising, a concept that is thought to be similar to mindfulness, is believed to develop with a secure attachment orientation (Wallin, 2007). With this in mind, a strong relationship was expected between secure attachment orientation and mindfulness.

However, the strength of the correlation was small and non-significant. This may be due to the small sample size and the small number of individuals who reported a secure attachment orientation (14 individuals or 25.5% of the total group). The percentage of securely attached individuals within a clinical population is often reported at approximately 24% (Johnson, Maddeaux, & Blomin, 1998). Alternatively, mentalising may not be sufficiently similar to mindfulness for correlations to be significant.

Mentalising is the ability to take a meta-cognitive view of mental states underlying experience, with a reflective stance (Fonagy, Gergeley, Jurist, & Target, 2002; Wallin, 2007). While mindfulness encompasses these same abilities, being mindful differs in that the individual is also completely present to experience (Wallin, 2007).

A secure attachment is believed to be a protective factor against difficulties with psychological health and to provide the foundation for emotional and psychological health. For example, securely attached individuals are reported to have higher self-esteem, lower levels of depression and anxiety, better general functioning and greater ability to resist impulsive urges than insecurely attached individuals (Flores, 2004; Johnson, Maddeaux, & Blomin, 1998; Mikulincer, Shaver, & Pereg, 2003; Polan & Hofer, 1999; Ward, Ramsay, & Treasure, 2000). Results from Study 2 indicated that,

while all relationships were in expected directions, there were no significant relationships between a secure attachment orientation and other non-attachment variables. Again this may be due to the small number of individuals who reported a secure attachment orientation in this group. Results differed from those of the non-clinical group where correlations between secure attachment and all variables except impulsivity were significant. Again, results are not directly comparable due to sample size and population differences.

Surprisingly, although there were large numbers of individuals who reported an insecure attachment orientation in the clinical sample, insecure attachment was only moderately correlated with other non-attachment variables, and did not have a significant unique relationship with emotion dysregulation or eating disorder symptoms. Again, results suggest that the more immediate factors such as mood problems (depression and anxiety), and impulsivity as an outcome of emotional distress (urgency) have greater impact on emotion dysregulation and eating disorder symptoms than attachment style does. Again, while emotion dysregulation may stem from early insecure attachments, the consequences of emotion dysregulation (mood problems, impulsivity, and difficulties with general functioning), may contribute more to difficulties in regulating emotions and eating disorder symptoms.

Mood. Mood (depression and anxiety) seems to be consistently related to emotion dysregulation. Rumination (depression) and worry (anxiety) are considered to be emotion regulation strategies, albeit not particularly effective ones so the relationship between mood and emotion dysregulation is not unexpected. Rumination is believed to be a means of diverting focus from more intense intolerable emotions and worry is believed a means

of finding solutions to problems or emotions that are currently problematic or may present themselves as problematic in the future (Borkovec & Roemer, 1995; Noelen-Hoeksema, Morrow, & Frederickson, 1993). Defensive pessimism, another maladaptive emotion regulation strategy helps anxious people cope by taking their focus away from their emotions so that they can plan and act effectively (Norem, 2002). All these strategies leave the individual in a dysregulated state, further contributing to emotion dysregulation. Clinical groups tend to report more anxiety and depression than non-clinical groups so the high magnitude of the relationship with eating disorder symptoms was also expected (Lovibond & Lovibond, 1995). Again this supports the use of mindfulness interventions as they have been shown to be effective in treating depression and anxiety (Jiminez, Niles, & Park, 2010; Kenny & Williams, 2007).

Study 2b – Paired T-Tests Comparing Pre-treatment to-Post-treatment Measures in a Clinical Sample.

As the final aim of Study 2, the impact of an 8-week mindfulness intervention for women with a binge-eating disorder was examined. Significant improvements were found in all domains except impulsivity. Participants reported being better able to regulate their emotions after the intervention. They reported improvements to mood and general functioning. This is consistent with findings from previous research that has stated that mindfulness interventions improved depression and anxiety (Chambers, Gullone, & Allen, 2009; Hayes & Feldman, 2004; Speca, Carlson, Goodey, & Angen, 2000).

Mindfulness increased which is consistent with previous findings from multiple research populations (Baer, Fischer & Huss, 2006; Baer, Smith, Hopkins, Krietmeyer, &

Toney, 2006). The tendency to act rashly when distressed decreased. As far as the author knows urgency has not previously been measured pre-to-post mindfulness intervention. This suggests that mindfulness interventions are promising for addressing some of the factors responsible for the severity of the binge type eating disorder. Urgency has been found to be uniquely related to ‘problem’ impulsive behaviours such as problem binge eating, problem gambling and problem substance use (Fischer, Smith, Spillane, & Cyders, 2005). Additionally, high urgency has been associated with weight and body image concerns in eating disordered populations (Mobbs, et al., 2010). Interventions that reduce urgency may therefore reduce symptom severity. For example, eating disorder symptoms decreased from being elevated clinical to the lower end of typical clinical in the current study, indicating that there was a reduction in symptom severity.

Impulsivity, as a whole construct was the only factor not to change significantly as result of a mindfulness intervention. This may be because impulsivity is considered to be a personality trait and would thus be more resistant to change. Alternatively, as results indicated that mindfulness and emotion dysregulation shared very strong relationships, and urgency was the only facet of impulsivity that was uniquely related to emotion regulation when controlling for lack of perseverance, lack of premeditation, and sensation seeking, it is possible that mindfulness (as an emotion regulation strategy) did not impact the overall construct of impulsivity. Results indicated that mindfulness did not address the facets of impulsivity other than urgency. As urgency is impulsive rash action while emotionally dysregulated, and has been associated with emotion dysregulation, depression and anxiety (Smith, et al., 2007) then it is possible that mindfulness as taught in the research program addressed mainly the emotional components of eating disorders

as opposed to developing skills in thinking before acting, reducing the desire to engage in risky behaviours, and perseverance at staying with boring tasks. For example sensation seeking is not likely to change through developing more present moment awareness or through being less judgemental. Mindfulness develops appreciation for things as they are without adverse reaction to them (Mahathera, 1990). It is possible that participants of the mindfulness intervention were able to remain non-judgemental and simply aware of their preference for new and exciting experiences, and presumably not act on them.

Mindfulness as taught in clinical interventions tends to focus on developing: tolerance for distress, decentred awareness of troublesome thoughts and emotions, and more acceptance and non-judgement of previously unapproved aspects of self (Chambers, Gullone, & Allen, 2009). While distress tolerance may prevent impulsive acting out (urgency), it likely does not impact the cognitive and behavioural aspects of impulsivity, such as lack of premeditation and lack of perseverance that are not related to distress tolerance. However, these aspects of impulsivity may not be as problematic to problem eating. As mentioned previously, urgency is related to *problem* drinking, gambling, and eating disordered behaviours (Fischer, Smith, Spillane, & Cyders, 2005). Other facets of impulsivity may contribute to difficulties in other areas (e.g. risky behaviours, lack of perseverance in tasks, engagement in frequency of impulsive behaviours; Smith et al., 2007) but may not be important when considering disordered eating.

Chapter 7 General Discussion

The aim of Study 1 was to examine the relationships between primary variables of emotion dysregulation, impulsivity, mindfulness, and eating disorder symptoms, and secondary variables of attachment orientation, mood, and general dysfunction in a non-clinical sample. Study 2 had two aims, the first, to examine these same relationships in a clinical sample (women who met the criteria for either bulimia or binge eating disorder). The second aim was to examine the impact of an 8-week mindfulness intervention on emotion dysregulation, impulsivity, mindfulness, eating disorder symptoms, mood, and general dysfunction for the eating disordered population.

Emotion dysregulation. There has been a growing interest in the relationship between emotion dysregulation and psychopathology, with the suggestion that emotion dysregulation underlies all psychopathology (Aldeo, Noelen-Hoeksema, & Schweizer, 2009; Bradley, 2003). Research has found that greater emotion dysregulation is associated with overall psychopathology and greater symptom severity in individuals with disordered behaviours (Aldeo, Noelen-Hoeksema, & Schweizer, 2009). Individuals who have difficulties regulating their emotions tend to experience negative emotions with greater intensity, with longer duration as well as having confusion about the overall meaning of emotion experience (Diamond & Aspinwall, 2003; John & Gross, 2003; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995; Schulman, Augustine, & Hemenover, 2006). When emotions are experienced in this heightened manner there are fewer internal resources available for regulating emotions, thereby increasing distress, suffering, and severity of pathopsychological symptoms (Aldeo, Noelen-Hoeksema, & Schweizer,

2009; Gratz, 2006). Emotion dysregulation and psychopathology is suggested as having a bi-directional and reinforcing effect on each other (Eftekhari, Zoellner, & Vigil, 2008).

The ubiquitous relationship between emotion dysregulation and psychopathology was largely supported by this research. In both clinical and non-clinical samples, greater emotion dysregulation was associated with greater psychopathology. For example, in support of previous research that demonstrates that emotion dysregulation is strongly related to depression and anxiety, it was found in the current research that mood, a composite of depression and anxiety symptoms, was highly and significantly related to emotion dysregulation (Chambers, Gullone, & Allen, 2009). These relationships were similar for emotion dysregulation and eating disorder symptoms, emotion dysregulation and general dysfunction, and emotion dysregulation and impulsivity. This indicates that emotion dysregulation may have a pervasive influence on multiple psychological difficulties. Similar patterns of results were found in both clinical and non-clinical samples suggesting that the relationship between emotion dysregulation and poor psychological functioning is not restricted to samples with higher levels of psychopathology. In support of this it is generally believed that individuals with high levels of psychopathology may utilise similar emotion regulation strategies to individuals with less psychopathology (e.g. a non-clinical individual) however, those with more psychopathology tend to use strategies with more rigidity that actually perpetuate poor psychological functioning (Werner & Gross, 2009).

Emotion dysregulation, impulsivity, and urgency. Emotion regulation difficulties have been implicated in over half the DSM-IV Axis I diagnoses and all the Axis II disorders with many also containing criteria that includes impulsivity (Gross,

1998). Although emotion dysregulation and impulsivity are frequently comorbid in DSM-IV disorders, they are infrequently assessed together (Cassin & von Ranson, 2005; Claes, Vandereycken, & Vertommen, 2005). There are some theories that suggest that impulsivity arises from an internally and emotionally dysregulated self (L'Abate, 1993; Marks-Tarlow, 1993) and others that suggest that impulsivity is a secondary attachment behaviour (impulsive or self-damaging behaviours when there is a belief in the chronic unavailability of attachment figures and therefore an inability to self-soothe; Flores, 2004; Zvolensky & Forsyth, 2002; Mikulincer, Shaver, & Pereg, 2003). Both have implications that impulsive action arises from deficits in emotion regulation. There is some suggestion that urgency (rash action while emotionally distressed) may be the most important facet of impulsivity in explaining the relationship with emotion dysregulation (Anestis, Smith, Fink, & Joiner, 2009). The current research explored the relationships with emotion dysregulation and impulsivity with some specific analyses exploring the relationship with emotion dysregulation and the four facets of impulsivity - urgency, lack of premeditation, lack of perseverance, and sensation seeking. What emerged was that urgency and emotion dysregulation share considerable variance but remain separate constructs. In the clinical sample urgency was the only unique correlate of emotion dysregulation when controlling for other facets of impulsivity. In the non-clinical sample both urgency and lack of perseverance were unique correlates of emotion dysregulation. What this suggests is that in an eating disordered population, urgency specifically, rather than impulsivity generally, contributes to disordered eating. These results could account for the inconclusive results reported in previous studies of impulsivity and bulimia (Fischer, Smith, & Cyders, 2008; Stice, 2002) where the facets of impulsivity are

differentially related to different behaviours (e.g. sensation seeking being related to the frequency of risky behaviours; lack of persistence with antisocial behaviours, and urgency with problem binge eating; Smith, et al., 2007) and support research on urgency that states that urgency is uniquely associated with binge eating (Fischer, Anderson, & Smith, 2004; Smith et al., 2007). These results also support theories that suggest that bulimia and binge eating disorder are disorders of affect regulation and urgency (Fischer, Smith, & Cyders, 2006; Heatherton & Baumeister, 1991; Reindl, 2001; Trattner-Sherman & Thompson, 1990), rather than disorders characterised by a dysfunctional system of evaluating self-worth based on eating habits, weight, and body shape (Fairburn, et al., 1986).

Impulsivity, urgency, and eating disorders. Research tends to find inconsistent relationships between impulsivity and eating disorders such as bulimia nervosa which has been hypothesised as being due to inconsistencies in the measurement of impulsivity (Fischer, Smith, & Cyders, 2008; Stice, 2002). While Whiteside and Lynam (2001) attempted to address these issues by developing a comprehensive, multifaceted measure of impulsivity, others still suggest that there are issues with the definition of impulsivity and therefore its measurement (Smith, Fischer, Cyders, Annus, Spillane, & McCarthy, 2007). Smith and colleagues (2007) consider urgency to be conceptually unrelated to impulsivity and have suggested that impulsivity is better understood as a lack of planning and forethought (lack of premeditation). Results from this study somewhat support this suggestion. Urgency was consistently significantly related to emotion dysregulation in both the clinical and non-clinical samples, even when controlling for other variables while other impulsivity subscales were not, indicating that urgency may be an expression

of emotion dysregulation rather than impulsivity. Correlations between urgency and emotion dysregulation were high, especially in the clinical sample, again supporting that there is a large amount of overlap in the definitions of these constructs.

Even though they are separate constructs, the description of how urgency influences problem behaviours is remarkably similar to the description of how emotional dysregulation results in disordered behaviours. For example, both are described as negatively reinforcing, where rash action when distressed may immediately relieve distress, which increases the likelihood of engaging in rash action the next time one is distressed. Whether describing urgency or a maladaptive emotion regulation strategy, the individual engaging in these behaviours loses the opportunity to attempt more adaptive responses to distress, thereby limiting access to coping (emotion regulation) strategies. These maladaptive strategies or rash actions may become habitual or perhaps become part of a personality style leading to further emotional dysregulation and problem behaviours (Diamond & Aspinwall, 2003; Gratz & Roemer, 2004; Kim, Deci, & Zuckerman, 2002; Smith, Fischer, Cyders, Annus, Spillane & McCarthy, 2007).

The high degree of common characteristics between urgency and maladaptive emotion regulation may help to explain why some theorists have posited that impulsivity is the outcome of an internally, emotionally dysregulated self (L'Abate, 1993; Marks-Tarlow, 1993). Regardless of whether urgency is a facet of impulsivity or is better explained as a maladaptive emotion regulation strategy, interventions that provide training in effective emotion regulation strategies would appear to be useful where the participant group is characterised by high urgency. Interventions for individuals high in other facets of impulsivity may need a different focus and different skills training, such as

attentional focus for lack of planning, or problem solving skills for lack of persistence (Smith, Fischer, Cyders, Annus, Spillane & McCarthy, 2007). It has been suggested that intervention components that heighten the ability to anticipate and inhibit binge and purge episodes would address problems with impulsivity in binge eating disorders (Kotler, Boudreau, & Devlin, 2003).

Impulsivity, urgency, and secondary attachment behaviours. As previously mentioned, impulsive action has been hypothesised as arising from emotional and internal dysregulation (L'Abate, 1993; Marks-Tarlow, 1993) and has been considered a secondary attachment behaviour (Mikulincer, Shaver, & Pereg, 2003; Zvolensky & Forsyth, 2002). While this study did not specifically address the direction of this relationship (if insecure attachment orientation precedes emotion dysregulation which then results in urgency or impulsive acts), results indicate that attachment orientation in adulthood was not significantly related to eating disorder symptoms in the clinical or non-clinical sample, and was not significantly related to emotion dysregulation in the clinical sample when controlling for all other variables. This indicates that impulsivity may not necessarily be a secondary attachment behaviour arising from poor emotion regulation. However, it is possible that attachment processes do not operate consciously and may therefore not be available to the participant answering self-report assessments (Ryan, Brown, & Creswell, 2007). Longitudinal research using an observational attachment measure would help to answer this question.

Emotion dysregulation and attachment orientation. Emotion dysregulation is believed to arise from poor quality early attachment relationships (Pietromenco, Feldman-Barrett, & Powers, 2006). An insecure attachment orientation has been found to

be related to emotion dysregulation and a number of poor psychological health outcomes (e.g. high levels of depression, anxiety, and hostility, less internal coherence, and less satisfying and lower quality relationships; Shaver & Mikulincer, 2007). This suggests that having an insecure attachment orientation has an impact on current functioning. When considering treatment and intervention for emotion dysregulation and other deficits in functioning, is it necessary to consider addressing attachment difficulties? Results from the current study suggest that attachment orientation may be of less importance in current functioning than the more immediate sources of distress such as depression and anxiety. While attachment was expected to be more central to emotion dysregulation and poor psychological health, the results from the current study are helpful in delineating what is most relevant to focus on in interventions with disordered populations.

It was expected that there would be significant and meaningful associations between attachment orientation, emotion dysregulation, and other related constructs including mindfulness. Although associations were in expected directions, results did not support the central role of attachment orientation to emotion dysregulation or to disordered eating cognitions and behaviours which are believed to be an outcome of dysregulated emotions (Eftekhari, Zoellner, & Vigil, 2008; Reindl, 2001). This may be due to a number of factors. There has been a considerable amount of debate about the usefulness of self-report measures when assessing attachment (Brennan, Clark, & Shaver, 1998; Garbarino, 1998). Studies utilising self-report measures of attachment style often report low to moderate alpha coefficients with particular problems reported with categorical measures (Kassel, Wardle, & Roberts, 2007; Leak & Cooney, 2001). This study attempted to reduce the difficulties by using a dimensional measure. However, the

ECR-R (Experiences in Close Relationships – Revised; Fraley, Waller, & Brennan, 2000) is still a self-report measure and may not have provided as accurate an assessment of attachment style as an interview measure. Self-report measures are believed to tap attachment in romantic relationships while the AAI (Adult Attachment Interview; George, Kaplan & Main, 1985) taps state of mind in relation to attachment (Shaver, Belsky, & Brennan, 2000). However, attachment style is proposed to have good temporal stability and should therefore be similar for both attachment in romantic relationships, and states of mind in relation to attachment (Main, Hesse, & Kaplan, 2005). A meta-analysis reported that the overlap of these measures was trivial to small (Roisman et al., 2007) whereas others have found that both interview and self-report measures share moderate correlations (Shaver, Belsky, & Brennan, 2000).

Another possible explanation for the non-significant relationships of attachment orientation with emotion dysregulation and eating disorder symptoms when controlling for other variables, may reside in theory that explains the internalisation of attachment security. It has been suggested that there is a three-step process. The first step involves using comforting interactions with an attachment figure to form mental representations of both the soothing caregiver and of oneself interacting with them. The second step involves integrating these interactions into one's memories and working models so that compassionate caregiving from others and from oneself towards oneself become a stable part of identity. The third step is to activate these representations in times of stress or need, which may initially initiate the search for an available attachment figure but may progressively provide self-sustaining mental representations and coping strategies without the need for an actual attachment figure. As these self-regulatory efforts become

integrated into one's personality, links to past attachment figures and caregiving become less conscious and potentially even invisible (Shaver, Lavy, Saron, & Mikulincer, 2007). If links to attachment related cognitive and emotional material are invisible, or at the least, unconscious, it is possible that the links between current functioning and attachment informed material are also invisible and therefore cannot be reported accurately or meaningfully. So, while the results from the current study suggest that attachment orientation does not have a primary influence on maladaptive functioning, it is possible that it does, but the process remains unconscious to the individual. Future research using observational and interview rather than self-report measures of attachment could assist in teasing out the relationship between attachment orientation and maladaptive functioning.

Mindfulness and emotion regulation. Mindfulness is gaining increasing attention as a possible antidote to emotional dysregulation (Chambers, Gullone, & Allen, 2009; Coffey & Hartman, 2008). Results from this research suggest that mindfulness may be the antithesis to emotion dysregulation and therefore may be very useful in treatments where emotion dysregulation is a component. The strength of the correlations between mindfulness and emotion dysregulation were somewhat unexpected. Correlations were very high ($r = -.78$ clinical; $r = -.71$ non-clinical). Previous research reported correlations of .48 with the Difficulties with Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), however, the previous study (Roemer et al., 2009) used the Mindful Awareness and Attention Scale (MAAS; Brown & Ryan, 2003) which is not considered to be as comprehensive a measure as the Five Factor Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Correlations between mindfulness and

emotion regulation were high in both the clinical and non-clinical samples and mindfulness was the largest unique contributor to emotion dysregulation in both samples when controlling for all other variables. These results indicate that there are many common underlying processes in both mindfulness and emotion regulation which therefore suggests that mindfulness is a protective factor against emotion dysregulation and may even be an adaptive emotion regulation strategy.

Mindfulness and attachment. It has been suggested that there are common underlying processes for mindfulness, emotion regulation, and attachment security (Mikulincer & Shaver, 2007). Results from this study supported the commonalities between mindfulness and emotion regulation but did not necessarily support a relationship between mindfulness and attachment security, or emotion regulation and attachment security. Using self-report measures to assess mindfulness is relatively recent, with a comprehensive, multi-faceted measure of mindfulness being adopted even more recently (Five Factor Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietmeyer, & Toney, 2006). It is possible that with the reported difficulties in operationalising mindfulness that self-report measures developed to date have not adequately captured the totality of mindfulness (Roemer et al., 2009). Measures to date focus largely on cognitive and self-acceptance based aspects of mindfulness or explicitly on mindful behaviours as in the FFMQ (Roemer et al., 2009) whereas similarities between attachment security and mindfulness have been suggested as being compassion, coherence of mind and self, less defensiveness, greater relationship satisfaction, and greater ability to accurately mobilise effective coping strategies, among others (Mikulincer & Shaver, 2007). Furthermore, attachment security and mindfulness may

either both contribute to a variety of positive outcomes (e.g. lower stress reactivity, better mental and physical health, better academic outcomes, greater relationship satisfaction and more constructive responses to relationship conflict), or may both develop along with a number of other positive outcomes when cultivated in attentive, responsive, and supportive environments (Ryan, Brown & Creswell, 2007).

Correlations between attachment security and mindfulness and attachment security and emotion dysregulation were moderate and significant in the non-clinical group and small and non-significant in the clinical group. As previously mentioned, correlations cannot be compared between samples due to the difference in sample size and lack of participant matching. However, these results indicate that mindfulness and secure attachment may not share as many underlying processes as previously suggested, even though both contribute to positive psychological and interpersonal outcomes (Ryan, Brown, & Creswell, 2007).

Mindfulness, emotion dysregulation and eating disorders. Examining specific relationships between subscales of measures of mindfulness, emotion dysregulation and disordered eating revealed some interesting results. Both emotion dysregulation and mindfulness appeared to be specifically significantly related to the bulimia subscale of the EDI-3 (Eating Disorder Inventory-3; Garner, 2004) indicating that drive for thinness and a dissatisfaction with weight and shape may not be driven by emotional dysregulation. This was apparent for the clinical sample only. In terms of interventions this would indicate that addressing the binge/purge aspects of eating disorders may best be served by mindfulness, but that the cognitions regarding the drive for thinness and dissatisfaction with weight & shape may need to be addressed with other modalities. It is

possible that a cognitive behavioural component could address these additional areas. It has been suggested that it is necessary to have multi-dimensional treatments to address all facets of eating disorders. It was previously found that cognitive change was an important but not necessary factor in relation to changes in binge-purge behaviours (Blouin et al., 1994). It is possible that combining mindfulness training with a more cognitive modality may provide the necessary combination of factors for treating people with eating disorders.

The intervention. It has been noted that empirical evidence that finds that treatment alters emotion dysregulation is slim (Rottenberg & Gross, 2007). Although not the main focus of this research, the results of the mindfulness intervention indicated that emotion dysregulation is improved through intervention. As mindfulness was found to be so closely related to emotion regulation in this study, it could be assumed that improving emotion regulation through mindfulness training would also improve other psychological difficulties. However, analyses in this study did not assess what the mechanisms of change were.

Improvements were found for emotion regulation, mindfulness, depression and anxiety, general dysfunction, and urgency. However, apart from urgency, other facets of impulsivity did not demonstrate significant improvement from pre-to-post mindfulness intervention. As previously discussed, these results suggest that interventions for disorders where both impulsivity and emotion dysregulation are present, treatment may need additional elements which improve difficulties with impulsivity. Further research to determine the nature of the relationship facets of impulsivity other than urgency have

with eating disorders is important in determining the most effective treatments for individuals with eating disorders.

Limitations and Future Directions.

Limitations and future directions have been mentioned throughout this chapter but will be summarised and expanded upon here. First, despite collapsing related measures and eliminating emotion regulation measures that were highly or moderately correlated, some remaining measures still had high correlations, thereby requiring assessment of multiple models and associations. This was found particularly in analyses with mindfulness and emotion dysregulation. As the measures of mindfulness and emotion dysregulation that were used in this study have been established as sharing a high degree of variance, future studies could explore the impact of mindfulness training on observed emotion regulation in experimentally induced situations.

A second limitation of the current study was that the clinical group was limited by a small sample size and were self-selected, reducing the generalisability of the results. However, the same analyses for Study 2a were performed in the larger non-clinical sample (Study 1), making results more generalisable and reducing the impact of this limitation. Furthermore, although there were differences suggested for how each attachment style regulates their emotions, there was not enough of each attachment style in the clinical sample to explore whether these suggestions held true. Larger samples, with a more representative proportion of each attachment style could be used to specifically examine the primary and secondary emotion regulation strategies each style applies. Additionally, results were not directly comparable across samples as participants

were not matched. Replication of this study with matched samples would contribute by allowing a direct comparison and contrast of outcomes.

A third limitation was that in both studies all findings were correlational so that no direction of causality could be established. However, the mindfulness intervention helps to establish the direct impact increased mindfulness has on emotion regulation, depression, anxiety, general functioning, urgency, and eating disorder symptoms. Despite this, it remains unclear as to whether improvements to mindfulness or other variables preceded improvements in poor psychological functioning. Future research could explore these variables in a longitudinal study and examine the intervention for mechanisms of change.

Finally, results may have been impacted by issues of measurement with attachment. Self-report measures have been suggested as being less reliable than interview style measures when assessing states of mind in relation to attachment which may have produced misleading results in analyses with attachment styles (Shaver, Belsky, & Brennan, 2000). Although emotion dysregulation and not attachment orientation was the central focus of this study, future research using the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) and exploring the nature of relationships with attachment, emotion dysregulation psychopathology and general dysfunction would provide valuable information for informing treatment.

Implications and Theoretical Contributions

These results make a significant theoretical contribution to the literature regarding the nature of the relationship between emotion dysregulation and psychopathology. It has previously been suggested that emotion dysregulation underlies all psychopathology and

is associated with greater symptom severity. The results largely support these assumptions, which is important in informing treatment options for a variety of psychological disorders. If it can be assumed that emotion dysregulation plays an important part in most, if not all psychopathology, then inclusion of training in emotion regulation skills in any psychological intervention is warranted and would likely be beneficial. As mindfulness was found to share such a close relationship with emotion regulation, and it has been found that mindfulness interventions improve a wide variety of psychological disorders, it could be assumed that mindfulness training could be an important modality used in interventions to improve emotion dysregulation (Coffey & Hartman, 2008; Leahey & Crowther, 2008; Sloan & Kring, 2007).

This study has further clarified that even though emotion dysregulation and impulsivity are frequently comorbid in psychological disorders, facets of impulsivity other than urgency, likely need a different treatment approach to emotion dysregulation. This has been supported in previous research that find multi-impulsives have a poorer treatment response (Myers, et al., 2006). It is possible that multi-impulsive individuals are not only high in urgency (rash action when emotionally distressed) which contributes to problem disordered behaviour, but are also high in sensation seeking which may predispose them to engage in multiple varieties of impulsive behaviours (Smith et al., 2007). Results from this study have suggested that mindfulness skills may be helpful in addressing urgency but where other facets of impulsivity are problematic, different treatment options are necessary.

Additionally, through providing a clearer picture of the relationship mindfulness has specifically with bulimia and binge eating disorder, this research has not only

contributed to the existing mindfulness and eating disorder literature but also provided some important information regarding treatment options. Although mindfulness was inversely related to bulimia, body dissatisfaction, and drive for thinness in the non-clinical sample, it was only related significantly to bulimia in the clinical sample. When informing treatment for women with bulimia, these results suggest that including additional elements in treatment to address the cognitions associated with disordered eating are necessary.

Conclusion

This research has contributed to theory of emotion dysregulation, mindfulness, and impulsivity through exploring their relationships in both clinical and non-clinical samples. Firstly, it has supported assumptions that emotion dysregulation underlies psychopathology. Second, it has helped to establish that the impulsivity facet urgency rather than impulsivity as a unitary construct is of greater importance in contributing to bulimia and binge eating disorder. Not only are there treatment implications from these results, in that learning to tolerate emotional distress should reduce rash action (binge eating), but these results indicate that bulimia and binge eating disorder better fit an emotion dysregulation and urgency model, than a model with impulsivity as a unitary construct. Thirdly, with mindfulness and emotion regulation so highly related, these results have supported that mindfulness may be an emotion regulation strategy and could therefore be applied to many disorders where emotion dysregulation is present. Finally, although attachment orientation has been found to be associated with a multitude of positive outcomes, this research has found that attachment orientation is of less importance in contributing to current issues for eating disordered individuals. It may

therefore not be necessary to be treating the root cause of emotion dysregulation (insecure attachment orientation) and instead address current emotion dysregulation deficits.

It is hoped that this research will inform future treatment for people with eating disorders and will prompt further research into the ways in which mindfulness improves emotion regulation, and eating disorder symptoms. A promising area for future research is the examination of other treatment factors that improve impulsivity so that a comprehensive treatment could be available for disorders such as bulimia and binge eating disorder, where impulsivity and emotion dysregulation are comorbid.

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Appendix 1

Study 1 Information Sheet and Consent Form

(PRINTED ON UNIVERSITY LETTERHEAD)

Mindfulness, Emotion Regulation and Impulsivity

INFORMATION SHEET

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The purpose of this research

As part of a PhD research project, Michelle Hanisch will be investigating mindfulness, emotion regulation and impulsivity. Mindfulness has been described as a way of being completely present in the moment. There is some suggestion that being mindful may have a relationship with the ability to regulate emotions and degree of impulsivity.

Your role in the research

You are invited to complete a number of questionnaires related to mindfulness, emotion regulation, impulsivity, and eating behaviour. These questionnaires are expected to take you between 30 and 45 minutes to complete. You will only be required to complete these assessments once.

Participation in the study is voluntary and you can decide to withdraw from the study at any time without explanation or penalty.

The expected benefits of this research

It is expected that this research will help to establish the theoretical link between emotion regulation, mindfulness and impulsivity that could potentially have benefits for individuals with problems regulating how they feel and managing problems with impulsivity.

Mindfulness-related research is rapidly increasing in the psychological community, and the benefits of mindfulness interventions are becoming well recognised. Participating in this research study will add to the existing knowledge about mindfulness and encourage more discussion about the utility of mindfulness in the treatment of a wide range of personal concerns.

Potential risks to you

There are no expected potential risks to you. However, there are some questions about substance use and eating behaviour. You can decide not to answer any questions that you feel uncomfortable answering.

Confidentiality

Information collected from the questionnaires will be **completely confidential**. There will be no means of identifying who completed which questionnaires and all records will be kept in a locked file that only the researchers have access to.

For further information consult the University's Privacy Plan at www.griffith.edu.au/ua/aa/vc/pp or telephone (07) 3735 5585.

Consent

Your consent is presumed by your participation in the study.

Further information

This project is being conducted as a requirement of the Doctor of Philosophy (Psychology). Please contact the Researcher or Research Supervisor using the contact details above if you require any additional information.

Furthermore, Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Research Involving Humans*. If you have any concerns or complaints about the ethical conduct of the project, please contact the Manager, Research Ethics on (07) 3735 5585 or research-ethics@griffith.edu.au.

Appendix 2

Study 2 Information Sheet

(PRINTED ON UNIVERSITY LETTERHEAD)

An Evaluation of a Mindfulness-based Group Program for Bulimia Nervosa

INFORMATION SHEET

Research Supervisor

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The purpose of this research

The practice of mindfulness has been described as a process of bringing non-judgemental awareness and acceptance to moment-by-moment experience. A growing body of research suggests that mindfulness practice may be helpful in managing the symptoms of a wide range of problems, including depression, stress, anxiety, binge eating, and chronic pain and illness. Mindfulness practice can also enhance a sense of general well-being and quality of life. The aim of this research is to evaluate the effectiveness of a mindfulness-based group program to manage symptoms and difficulties associated with Bulimia Nervosa and Binge Eating.

Your role in the research

You are invited to participate in the Mindfulness-based Treatment Program with a small group of people experiencing symptoms associated with Bulimia Nervosa and Binge Eating. You will be allocated to either join the program immediately or wait for an eight-week period before starting. Prior to commencing the program, you will be required to complete a number of questionnaires.

During the program, you will be presented with information about the practice of mindfulness. You will also be provided with the opportunity to participate in a variety of exercises designed to give you hands-on experience with the practice. Qualified and experienced intern psychologists will facilitate the program. All facilitators have a personal experience with mindfulness, and will receive supervision by an experienced clinical psychologist throughout the course of the program.

You will be asked to respond to a number of pencil and paper questionnaires before, during and after the program commences. These questionnaires should take approximately 40 minutes of your time, and can be completed before the commencement of the session. You will also be invited to provide feedback on your personal experience of participation in the program. Throughout the program, you will be asked to keep a record of the duration of homework mindfulness practice. The practice will take approximately 20 minutes per day. The recording of practice should take no more than approximately 5 minutes per day, and will be collected each week. Assistance will be available during completion of the questionnaires if required. Follow-up assessment will occur one month after completion of the program. This information will be obtained either during a follow-up session or by post.

Participation in the study is voluntary and you can decide to withdraw from the study at any time without explanation or penalty.

The expected benefits of this research

It is expected that this research will have benefits for you as an individual and at a wider community level. Current research indicates that mindfulness can significantly enhance a person's ability to cope with stress, anxiety, depression, and binge-eating.

Mindfulness-related research is rapidly increasing in the psychological research community. Participating in this research study will add to the existing knowledge about mindfulness and encourage more discussion about the utility of mindfulness in the treatment of a wide range of personal concerns.

Potential risks to you

In the short term, mindfulness can sometimes increase attention to, and awareness of, feelings of emotional or physical discomfort. These experiences are normal, and do not necessarily occur for all people. To receive maximum benefit from this program requires a commitment to persist with the group through these feelings of discomfort. Facilitators are trained to ensure your safe and therapeutic facilitation of the group, and will remain vigilant to promote your comfort and safety at all times. A referral to an alternative treatment or intervention service will be provided in the event that this group does not adequately support your needs.

Confidentiality

On agreeing to participate in this research, you will be allocated a code to identify your details. The code will then be used to identify the data collected from your responses to the completed questionnaires. The data and identifying code will be stored separately so that your confidentiality will be preserved. The information you provide will not be reviewed by anyone other than the Researchers or Research Supervisor.

If you wish, you will be provided with a summary of your results following participation in the program, and of the overall results on completion of the study.

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity at all times will be safeguarded. For further information consult the University's Privacy Plan at www.griffith.edu.au/ua/aa/vc/pp or telephone (07) 3735 5585.

Further information

This project is being conducted as a requirement of the Doctor of Philosophy (Clinical Psychology). Please contact the Researcher or Research Supervisor using the contact details above if you require any additional information.

Furthermore, Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Research Involving Humans*. If you have any concerns or complaints about the ethical conduct of the project, please contact the Manager, Research Ethics on (07) 3735 5585 or research-ethics@griffith.edu.au.

If you require further counselling support at any time prior to, or during the program, and are unable to contact the researcher, it is recommended that you contact Lifeline on 131114.

Appendix 3

Study 2 Consent Form

(PRINTED ON UNIVERISTY LETTERHEAD)

An Evaluation of a Mindfulness-based Group Program for Bulimia Nervosa

CONSENT FORM

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Statement of Consent

By signing below, I confirm that I have read and understood the information provided and in particular that:

- I understand that my involvement in this research will include the completion of a set of paper and pencil questionnaires and records before, during and after participation in the Mindfulness-based group Program for Bulimia Nervosa and Binge Eating;
- I have had any questions answered to my satisfaction;
- I understand the risks involved;
- I understand that my participation in this research is voluntary;
- I understand that I am free to withdraw at any time, without comment or penalty from the research project, and then continue to participate in the program;
- I understand that if I have any additional questions I can contact the research team;
- I understand that I can contact the Manager, Research Ethics at Griffith University Human Research Ethics Committee on (07) 3735 5585 (or [research-](#)

ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and

- I agree to participate in the project.

Name (First and Family Name)

Signature

Date: _____

Statement of Video-tape Consent

- Video tape recordings are made to enable clinicians to maintain consistent delivery of the program.
- The video recordings will be viewed by the clinicians involved in the research team to maintain program integrity.
- The tape will be erased as soon as the research process is complete.
- I understand that I have the right to request that the tape be turned off at any point during the sessions.
- I hereby consent to have a video tape made on the above conditions.
- All video tapes will be securely maintained.

Name: _____

Signature: _____

Date: _____

Appendix 4

Phone Interview Screening Call

Hello _____. This is _____ from the Griffith University Mindfulness Program. You have shown some interest in our program/left your contact details for us to get back to you. This is just a brief phone call – it should only take about 10 minutes. Is this a good time for you or can we arrange a more convenient time?

First, I'd just like to ask a few questions about you, and then if you have any questions for me, I'd be happy to answer them.

Some of these questions might seem a bit personal in terms of specific eating habits, but this information is important to ensure that this program is going to be of value to you.

What is your age? _____

Do you binge eat? Y N

How much would you typically eat during a binge?

How often on average do you do this? - 2/wk + 2/wk

How long has that been happening for you? _____

Some people do things to make up for the binge – is this something you would do?
Y N

How do you do compensate for the binge?

(a) purge	(b) exercise excessively	(c) laxatives
(d) restrict eating	(e) enema	(f) medication
How often on average do you do this?		- 2/wk + 2/wk

How long has that been happening for you? _____

How do you currently feel about your body? _____

Have you ever had, or currently have, anorexia? Current Y N Previous Y N

How tall are you? _____ How much do you weigh? _____

BMI +18 -18

If -18:

Do you currently weigh less than other people think you should weigh? **Y N**

If Y: Do you still feel too fat, or that a part of your body is too fat? **Y N**

Have you stopped menstruating? **Y N**

NOT ACCEPTED:

Unfortunately, from what you have told me, this particular group doesn't sound like it would be very helpful for you, because:

(a) BMI: Your body mass index is below that range that we are accepting into the groups at this stage.

(b) Binge frequency/size: while it sounds like you are concerned about how much you are eating, the program is intended for people who are actually consuming considerably more/doing this more often.

I can give you some details of other organisations you could contact, and I'd like to keep your contact details in case there are additional programs in the future. Is that ok with you?

RBH Eating Disorders Unit: 3636 5241

Overeaters Anonymous: 3229 6977

Thankyou for your time.

ACCEPTED:

It sounds like this program could be of benefit to you. It will run over 8 weeks on from

There will be other women in the group with the same sorts of concerns as you.

This is an innovative program that is based on Mindfulness, which has been used to help improve the quality of people's lives. At its most basic, it is about bringing acceptance and awareness to the present moment but we will explain this in much more depth.

How does this sound to you? Do you have any questions?

The first step is you will meet me for an interview that will take about an hour, but its best to allow an hour and a half. You will fill out some questionnaires, we can answer your questions, and we can discuss some of the things that are happening for you at the moment in more detail.

We can offer this program at no charge to you because it's a research project.

There will be 2 programs running this year, one starting in, and the other in At the end of the interview you will draw an envelope out of a box that will say which program you attend. If this is the [Waitlist] group, we'll call you regularly during this time though to see how you're going.

I have these appointment times available. What is best for you? Confirm time and date.

I'd like to send out some information on the program and how to get here. What's the best address to send it to?

Thankyou for your time - I look forward to meeting you.

Appendix 5

Intake Interview Procedure

The purpose of today's interview is to determine whether this program will be helpful for you. As we said on the phone, we are able to offer this program at no cost because it is a research project, but what this also means is that we have to abide by certain guidelines and can't necessarily include everyone who is interested. If this is the case, for you, we will provide with referrals to other services.

What will happen today is that I will ask you a series of questions that I would like to you to answer as truthfully as possible, with the understanding that this is confidential. Not all of the questions will necessarily apply to you, but we need to ask them all. Although the focus of many of these questions is on eating habits, weight and body image issues, the program itself is more gentle, and has a much broader focus.

Let me know if you would like to take a break at any time, or no longer wish to proceed with the interview.

Do you have any questions for me at this stage?

Now we can proceed with the questions.

1. Administer EDE

- decision process if meet or not meet criteria

If NO: It seems that the issues you describe do not fully meet our criteria for bulimia, and in this case, this program would not be the most suitable treatment for you. We appreciate your time – provide referrals.

2. Administer SCID – BPD

- decision process

If NO: Right now I am more concerned about your safety and I think it's more important for you to focus on that right now.

3. Administer SCID – psychosis

- decision process

If NO: Risk assessment

There are some things happening for you right now that will probably require some treatment. Refer to hospital for assessment.

4. Administer AUDIT

- decision: 20+

If NO: Your responses indicate that you may have some substance use problems that might interfere with your experience and extent to which you may benefit from the group. It may be a good idea to seek further treatment. If you're interested, I can provide you with some referrals

5. Administer DAST

- decision: 7+

If NO: Your responses indicate that you may have some substance use problems that might interfere with your experience and extent to which you may benefit from the group. It may be a good idea to seek further treatment. If you're interested, I can provide you with some referrals

Ok, that's all the questions I need to ask.

If Uncertain:

Thankyou for answering these questions. There are a couple of things about the guidelines for inclusion that I need to clarify with my supervisor, to ensure that this is the most appropriate program for you at this time. I'm sorry I can't give you a definite answer now; can I get back to you within the week to confirm?

If Accepted:

On the basis of your responses, it is likely that this program will be suitable for you.

Go through information sheet – make sure they understand.

Go through consent form, obtain signature.

Randomisation:

As we mentioned in the phone call, there will be 2 programs running this year. If you would like to select an envelope out of this box, this will determine whether you begin in August or October.

Confirm dates and times (have flyer)

Assessment Package

If you would like, it may be more convenient for you to fill out some questionnaires before you leave today. They will take approximately 30 minutes.

(give in sealed envelope – fill out in waiting area, hand in at reception)

If no: ask to fill out prior to group, and bring with them that day.

Thank for time. Look forward to seeing them when the program begins.

Appendix 6

Waitlist screening call:

This is just a quick call to remind you that the group is starting next week. I just wanted to make sure that you're still ok to attend.

How have things been for you since our last meeting?

If experiencing difficulties suggest a later group.

How have things been with your eating since we spoke?

Prompt to assess whether still meet criteria e.g. binge episodes, frequency/quantity. If don't meet criteria, congratulate them and suggest that program may not be useful as eating issues seem to have resolved at this time. Can contact us again if situation changes.

We'll be sending out some questionnaires this week. Can you please fill them out and bring them to the first session. We're really looking forward to seeing you there.

Appendix 7

Demographic Information

To assist with the research aspect of the program, we first need some information about the different people who take part. Please answer all of the following questions. All information is confidential.

1. What is your age? _____ years

2. Which of the following best describes your marital status (please tick)?

- | | |
|------------------------|----------------------------|
| Single (never married) | <input type="checkbox"/> 1 |
| Married | <input type="checkbox"/> 2 |
| Defacto | <input type="checkbox"/> |
| Partnered | <input type="checkbox"/> 4 |
| Divorced | <input type="checkbox"/> 5 |
| Widowed | <input type="checkbox"/> 6 |

3. Which of the following best describes your employment status (please tick)?

- | | |
|-----------------------------------|----------------------------|
| Employed full-time (30+ hrs/week) | <input type="checkbox"/> 1 |
| Employed part-time/casually | <input type="checkbox"/> 2 |
| Home duties | <input type="checkbox"/> 3 |
| Unemployed | <input type="checkbox"/> 4 |
| Disability pension | <input type="checkbox"/> 5 |
| Student | <input type="checkbox"/> 6 |
| Retired | <input type="checkbox"/> 7 |
| Other (please specify _____) | <input type="checkbox"/> 8 |

4. Which of the following best describes your level of completed education (please tick)?

- | | |
|---------------------|----------------------------|
| Primary | <input type="checkbox"/> 1 |
| Secondary | <input type="checkbox"/> 2 |
| TAFE/Apprenticeship | <input type="checkbox"/> 3 |
| Tertiary | <input type="checkbox"/> 4 |

5. Have you had previous meditation experience (please tick)?

- | | |
|-----|--|
| No | <input type="checkbox"/> 1 (please proceed to question 9) |
| Yes | <input type="checkbox"/> 2 (please continue to question 6) |

6. How long have you been practicing meditation (please tick)?

- | | |
|------------------------|----------------------------|
| Less than 1 year | <input type="checkbox"/> 1 |
| 1 – 2 years | <input type="checkbox"/> 2 |
| 2- 5 years | <input type="checkbox"/> 3 |
| More than 5 years | <input type="checkbox"/> 4 |
| Other (please specify) | <input type="checkbox"/> 5 |

7. Which of the following would best describe how frequently you meditate (please tick)?

- Daily ☐ 1
 Few times per week ☐ 2
 Once per week ☐ 3
 Once per month ☐ 4
 Other (please specify) ☐ 5

8. Which of the following would best describe the average duration of a typical meditation session?

- 5 - 10 mins ☐ 1
 10 – 20 mins ☐ 2
 20 – 30 mins ☐ 3
 More than 30 mins ☐ 4
 Other (please specify) ☐ 5

9. Have you ever received psychological treatment before (please tick)?

- No ☐ 1 (please proceed to the next page)
 Yes ☐ 2 (please continue to question 10)

10. When was your most recent psychological treatment (please tick)?

- Currently ☐ 1
 Less than 1year ☐ 2
 1 – 2 years ☐ 3
 2 – 5 years ☐ 4
 More than 5 years ☐ 5
 Other (please specify) ☐ 6

11. What is the longest period of time you have spent in therapy (e.g. 6 months)?

12. Have you ever been given a mental health diagnosis?

- No ☐ 1 (please proceed to question 15)
 Yes ☐ 2 (please continue to question 13)

13. What was your diagnosis? _____

14. Do you take medication for your diagnosis?

- No ☐ 1
 Yes (please specify) ☐ 2 _____

15. Do you regularly use illegal or prescription drugs?

- No ☐ 1 (thankyou, you have finished)
Yes ☐ 2 (please proceed to question 16)

16. What type?

- Speed, Ice, Cocaine etc ☐ 1
Ecstasy, ☐ 2
Heroin, Morphine etc ☐ 3
LSD ☐ 4
Valium, Xanax etc ☐ 5
Marijuana, Hash etc ☐ 6

17. What best describes how frequently you use substances?

- Daily ☐ 1
Once or twice a week ☐ 2
Once or twice a month ☐ 3
On special occasions ☐ 4

Appendix 8
Outcome Questionnaire

Appendix 9
Eating Disorder Inventory 3

Appendix 10

Participant Recruitment Advertisement

INNOVATIVE TREATMENT PROGRAM FOR BULIMIA

- ❖ Mindfulness is rapidly gaining recognition in the field of psychology. Research has shown that it is effective for a range of issues, including anxiety, stress management, depression and chronic pain.
- ❖ Recently, mindfulness-based treatments such as Dialectical Behaviour Therapy and Mindfulness-Based Cognitive Therapy have been found to be effective in managing binge eating disorder and bulimia nervosa.
- ❖ Griffith University is currently conducting research into the effectiveness of an 8- session mindfulness group treatment for bulimia. The treatment will be conducted both in Brisbane and on the Gold Coast.
- ❖ The program is being offered free of charge. Participants will also receive printed resources and CDs.
- ❖ To be eligible for the program, participants will need to be female, between the ages of 18 - 65, and not be experiencing psychosis, imminent risk of suicide, substance abuse at harmful levels, or currently meet criteria for anorexia. Participants currently receiving individual therapy will not be excluded.
- ❖ The treatment groups will commence mid-August, 2006.
- ❖ Please find attached a copy of the print ad, which can be distributed to clients
- ❖ For further details and information on how to refer eligible participants, please contact the researchers by phone (07) 3735 3324, or by e-mail:

Angela Morgan a.morgan@griffith.edu.au
Michelle Hanisch m.hanisch@griffith.edu.au

Do you secretly **binge eat** then go to extreme lengths to **compensate**? Are you intensely **dissatisfied** with your body? Would you like to manage your life better?

If "yes", a research team at Griffith University is currently offering a group **mindfulness program** for people with similar concerns. There is **no charge** for the program. It will involve: 1hr individual interview; 2hr sessions per week for 8 weeks; completion of several questionnaires.

Suitable **female** participants will be 18 - 65 yrs, will not have anorexia nervosa, and will not be regularly using alcohol or recreational drugs at harmful levels.

Groups will be run on the **Gold Coast** and in **Brisbane**. If you are interested in participating in this program, please call **(07) 3735 3324** or email:

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