AN EXAMINATION OF THE RELATIONSHIP BETWEEN EMOTION REGULATION AND ALEXITHYMIA

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by

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Abstract

Emotion regulation refers to a set of processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions (Gross, 1998). Many of the terms for emotion regulation are used interchangeably and engender ambiguity in the emotion regulation literature. As such, precise distinctions between emotion regulation and related constructs have been unclear (Cole, Martin, & Dennis, 1994).

One construct that has often been used as a measure of emotion regulation abilities is alexithymia (Nemiah, Freyberger, & Sifneos, 1976). Alexithymia is a personality trait thought to reflect a deficit in the cognitive processing and regulation of emotional states (Luminet, Rime, Bagby, & Taylor, 2004; Taylor, 2000). Currently, limited research has investigated how alexithymia relates to our current conceptualization of emotion regulation and associated emotion regulation skills.

The present research elucidated the ambiguity between emotion regulation and alexithymia by examining their similarities. These constructs were further investigated in relation to their theoretical correlates of self-management (Kanfer & Karoly, 1972; Bandura, 1991) and external locus of control (Rotter, 1966) in order to highlight their differences. As expected, emotion regulation and alexithymia were strongly related to each other, with alexithymia demonstrating the strongest association to the emotion regulation skills of awareness and clarity of emotional responses. Results also revealed that both alexithymia and emotion regulation were highly related to self-management and

external locus of control. In particular, alexithymia was found to be a stronger predictor of both self-management and external locus of control compared to emotion regulation.

Keywords: emotion regulation, alexithymia, self-management, locus of control.

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"I can no other answer make but thanks, and thanks, and ever thanks."

- Shakespeare

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List of Abbreviations

DERS	Difficulties in Emotion Regulation Scale
IPC	Internality, Powerful Others, and Chance Scales
IPC-C	Chance Subscale
IPC-P	Powerful Others Subscale
MCSD	Marlowe-Crowne Social Desirability Scale
SCMS	Self-Control Self-Management Scale
SES	Self-Evaluation Subscale
SMS	Self-Monitoring Subscale
SRS	Self-Reinforcement Subscale
TAS-20	Twenty-Item Toronto Alexithymia Scale

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An Examination of the Relationship between Emotion Regulation and Alexithymia

Emotions serve many important roles. They are used to meet situational demands, guide decision-making, promote learning, and facilitate interpersonal interactions (Gross, 1998). Inappropriate emotional responses have been associated with various psychopathologies (e.g., borderline personality disorder; Levine, Marziali, & Hood, 1997), reduced social connectedness (Mauss et al., 2011), and decreased job satisfaction (Diefendorff, Erikson, Grandey, & Dahling, 2011). Overall, it appears that not being able to manage one's emotions is commonly associated with maladaptive psychosocial functioning.

Emotion regulation is a construct that emerged in the early 1990s. It is a mechanism that modulates or maintains emotional experiences, and refers to a set of processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions (Gross, 1998; Gross & Munez, 1995). Since the emergence of the construct, the number of articles targeting research in the field of emotion regulation has risen dramatically. For example, between 1990 and 2005, the citation count containing the phrase "emotion regulation" sharply increased from four citations to 671 citations (Gross, 2008). It is clear that emotion regulation is a hot topic of study for psychologists and researchers. However, there appears to be a lack of precision in the regulation literature in distinguishing between the construct of emotion regulation, and related constructs that assess specific emotion regulation skills (i.e., lack of awareness, clarity, acceptance of emotional response, access to strategies, goal-setting abilities, and impulse control; Gratz & Roemer, 2004).

Differences between the construct of emotion regulation, and terms for other constructs and variables used to measure and operationalize emotion regulation, appear to be used interchangeably. This engenders imprecision and ambiguity in the emotion regulation literature.

One construct that has commonly been used as a measure of emotion regulation abilities is alexithymia (Nemiah, Freyberger, & Sifneos, 1976). Alexithymia is a personality trait thought to reflect a deficit in the cognitive processing and regulation of emotional states (Taylor, 1994; Luminet et al., 2004). Individuals with alexithymic characteristics are considered to have emotion regulation difficulties; however, it is unclear how these difficulties specifically relate to the construct of emotion regulation and associated emotion regulation skills.

A precise understanding of the distinguishing features between emotion regulation and related constructs that assess emotion regulation skills is crucial for interpreting prior literature and informing future research. Furthermore, a lack of clarity and precision in the emotion regulation literature has serious implications for clinical practice. For example, enhancing emotion regulation skills provides the basis for the majority of third-wave cognitive behavioural therapies (i.e., Dialectical Behaviour Therapy: Linehan, 1998). However, the individual therapies differ in the emphasis that they allocate to enhancing specific emotion regulation skills. Thus, it is imperative that individuals with alexithymia receive optimal treatment that targets their specific emotion regulation deficits.

The purpose of the present research is twofold. First, the unique relationships between emotion regulation and alexithymia will be delineated. Examining the

similarities between emotion regulation skills and the individual facets of alexithymia will facilitate our understanding of the broader self-regulation literature. Secondly, the differences between emotion regulation and alexithymia will be highlighted by examining their unique roles in predicting associated constructs. To further compare and contrast emotion regulation and alexithymia, significant correlates (namely, locus of control and self-management) will be studied to facilitate our understanding of the proposed differences between the two constructs. Ultimately, this research aims to inform theory by refining the emotion regulation literature, and inform practice by gaining an increased understanding of emotional deficits associated with alexithymia.

Emotion Regulation

Emotion regulation is a set of processes by which individuals evaluate and modify their emotional reactions in order to accomplish their goals (Thompson, 1994). Emotion regulation skills have been found to play an important role for an individual's psychological health and overall well-being (Gross & John, 2003). Difficulties in emotion regulation skills have been associated with a variety of clinical disorders including depression and anxiety (Dennis, 2007), borderline personality disorder (Linehan, 1998), and eating disorders (Telch, Agras, & Linehan, 2000), as well as maladaptive behaviours including non-suicidal self-injury (Williams & Hasking, 2009) and substance abuse (Linehan et al., 1999). It is clear that difficulties in emotion regulation skills impede an individual's optimal functioning.

Emotion regulation processes are aimed at changing core affect (Koole, 2009). Affect is both negative and positive. Negative affect (NA) represents the extent to which an individual feels upset or angry. Conversely, positive affect (PA) represents the extent

to which an individual feels pleasure and enjoys life (Clark & Watson, 1991). The goal of emotion regulation is to increase positive affect and decrease negative affect (Gross & Thompson, 2007).

Affect modulation occurs through the interplay of three components. First, an individual attends to a situation and appraises the situation according to his or her goals. The individual then attributes meaning to the situation and subsequently experiences an emotional response to the situation (Gross, 1998; Mauss & Robinson, 2009). These features form a four modal model of emotion regulation (see Figure 1). Each modal has its own unique methods for achieving increased emotion regulation. The first modal, Situation, consists of two parts: Situation Selection (choosing a situation that is not distressing) and Situation Modification (directly changing a situation to modify its emotional impact). The second modal, Attention, consists of attentional deployment, or influencing an emotional responding by re-directing attention elsewhere. The third modal, Appraisal, consists of cognitive change; or how one's thoughts pertaining to the situation can be changed to alter the situation's emotional significance. The final modal, Response, consists of modulating experiential, behavioural, or physiological responses after response tendencies already occurred (Gross & Barrett, 2011). These features form a recursive feedback loop whereby one modal can affect another modal of the sequence (Gross, 1998). For example, if the situation is distressing (situation modal) and the individual experiences an emotional response of 'fear', the individual might reappraise (appraisal modal) the situation in order to calm himself down. Conversely, the individual might avoid the situation and ultimately become more fearful. The manner in which an

individual attends to the situation, interprets the situation, and reacts to the situation influences his ability to regulate his emotions (Gross, 1998).

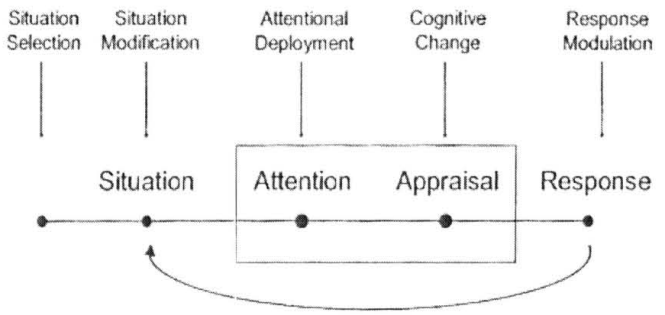

Figure 1. The modal model of emotion regulation.

Note. Taken from "Handbook of Emotion Regulation" by J. Gross, & R.A. Thompson, 2007. Copyright 2007 by the New York: Guilford Press.

The recursive nature of emotion regulation influences various components in the experience of an emotional event. Previous research conceptualizes emotions as having multiple components including expression, experience, physiology, and brain activation (Kring, 2010). The interplay of these components enables an individual to experience emotions as a 'whole-body' response (Gross & Thompson, 2007), whereby one component directly affects another component. For example, feeling excited (expression) may accelerate an individual's heartbeat (physiological) and increase feelings of euphoria (brain activation). The manner in which these components affect each other can lead to subjective experiences in emotion. Within this view, both cognitions and behaviours regulate an emotional experience and work together to alleviate emotional distress (Hearterton & Baumeister, 1991).

The degree to which an individual is able to regulate her or her emotions depends on four core abilities (Gratz & Roemer, 2004). First, an awareness and understanding of

the emotional experience is the first step for managing emotions. Recognizing emotions, putting them into words, and further reflecting on the emotional experience helps one understand his emotions (Greenberg, 2007). An awareness of emotions is necessary in order to successfully regulate them (Connelly & Denney, 2007). Second, the ability to control impulsive behaviours and behave in accordance with desired goals when experiencing negative emotions is necessary for effective emotion regulation. Negative affect, and subsequent emotional distress, can be so aversive that some individuals lose self-control and engage in maladaptive behaviours such as drinking (Marlatt, 1985), dieting relapses (Herman & Polivy, 1975), impulse buying (Faber, 1992), or procrastination (Ferrari, 1991) in order to feel better as soon as possible. This breakdown in self-control is represented by the desire to experience short-term gains (to feel better now) despite long-term costs; in essence, substituting a short-term goal for a long-term goal (Tice & Bratslavsky, 2000). Third, accepting one's own emotions, rather than attempting to eliminate emotions by controlling them, allows for the inhibition of inappropriate or impulsive behaviours. As a result, an individual can behave in accordance with the desired goal when experiencing negative emotions (Gratz & Roemer, 2004). Finally, access to strategies that are perceived as effective in reducing one's distress when one is upset is important for emotion regulation to occur (Gratz & Roemer, 2004). Although any strategy can be used to achieve emotion regulation (Gross, 1998), it has been proposed that the ability to use situationally appropriate emotion regulation strategies in a flexible manner is integral for adaptive functioning (Cole, Martin, & Dennis, 2004). Strategies influence the entire emotion trajectory as they help dictate an individual's response tendency (Swart, Kortekaas, & Aleman., 2009). In general,

strategies that attempt to control and constrict emotional expression are thought to be maladaptive (Notarius & Levenson, 1979). Maladaptive strategies have been associated with the use of maladaptive behaviours under times of distress. For example, individuals who exhibit higher levels of the maladaptive strategy of response-focused regulation, or suppression, have been found to engage in deliberate self-harm when experiencing negative emotions (Garish & Wilson, 2010).

Since the conceptualization of the construct of emotion regulation in the early 1990s, previous or alternative related constructs have not been compared and contrasted with emotion regulation. There has been a lack of precision in the regulation literature distinguishing between the construct of emotion regulation and related constructs that assess specific emotion regulation skills (i.e., lack of awareness, clarity, acceptance of emotional response, access to strategies, goal-setting abilities, and impulse control; Gratz & Roemer, 2004). Terms for emotion regulation and related constructs are currently being used interchangeably within the emotion regulation literature. Several of these constructs have yet to be compared to the construct of emotion regulation, and to each other. A clear delineation of the distinguishing features between the construct of emotion regulation, and related constructs that assess emotion regulation skills, is necessary for both interpreting prior studies and guiding future research. Furthermore, a thorough understanding of these relationships will allow for an enhanced understanding of the specific emotion regulation difficulties associated with diverse community and clinical populations.

Alexithymia

One construct that has been used as a measure of emotion regulation is alexithymia. The term alexithymia was initially employed to describe a group of characteristics found among psychosomatic patients (Sifneos, 1973). Alexithymia, literally translating to 'without words for feelings,' was originally characterized as having difficulties in identifying and expressing feelings, a paucity of fantasies, a utilitarian way of thinking, and difficulties in distinguishing between feelings and physical sensations (Sifneos, 1973; Nemiah, Freyberger, & Sifneos, 1976; as cited in Zimmerman, Rossier, Stadelhofen, & Gaillard, 2005). It is thought that the emotional deficits exhibited by alexithymic individuals interfere with their ability to recognize somatic manifestations of emotions, thus leading them to misinterpret their emotions as physical illnesses (Taylor, Bagby., & Parker, 1997).

Currently, alexithymia is thought to be a multifaceted personality trait reflecting a deficit in the cognitive processing and regulation of emotional states (Luminet et al., 2004). Alexithymia is normally distributed in the general population (Taylor et al., 1997), with clinical prevalence rates ranging from 5%–10% in the general population (Mattila et al., 2010).

Alexithymia is associated with high negative affect (Honkalampi, Hintikka, Laukkanen, Lehtonen, & Vinama, 2001) and undifferentiated unpleasant emotional arousal (Zimmerman et al., 2005). Although individuals with alexithymia experience physiological arousal, they appear to have difficulty identifying, understanding, and describing this arousal or their feelings (Bagby, Taylor, & Parker, 1994). Alexithymia has

been related to a range of psychological problems including mood disorders (Taylor, 2000) and suicidal ideation (Hintikka et al., 2004).

Alexithymia is a multifaceted construct that varies across cognitive and affective facets. Alexithymia encompasses three main facets: difficulties identifying one's feelings (DIF), difficulties describing one's feelings (DDF), and an externally oriented thinking style (EOT). Difficulties identifying one's feelings (DIF) is described as the inability to take one's emotional state as a guide for judgement, decision making, and action. Difficulties describing one's feelings (DDF) is one's lack of words for emotional states and events, and an externally oriented thinking style (EOT) is a cognitive style characterised by a preoccupation with the minute details of external events, rather than by emotions, fantasies and other aspects of inner experience (Bagby et al., 1994; Di Schiena, Luminet, & Phillipot, 2011).

The various facets of alexithymia have been differentially related to specific psychological difficulties. For example, the association between alexithymia and depression has been well validated (i.e., Honkalampi et al., 2001). However, this association was found to be primarily accounted for by the difficulties identifying feelings (DIF) facet, less so by the difficulties describing feelings (DDF) facet, and not at all by the externally oriented thinking (EOT) facet (i.e., Di Schiena et al., 2011). The difficulties identifying feelings facet has been particularly associated with increased levels of negative affect (Bailey & Henry, 2007) and increased rumination (Di Schiena et al., 2011). Several studies have found that the externally oriented thinking facet is typically not a strong predictor of variables related to emotional disturbances, such as neuroticism and depression (e.g., Culhane & Watson, 2003). One possible explanation for

this phenomenon is that the externally oriented thinking facet has been associated with potential confounds across various studies, such as verbal ability and socioeconomic status (Lumley, Gustavson, Partridge, Ty, & Labouvie-Vief, 2005). It is also possible that the externally oriented thinking facet might be contingent upon the severity of the difficulties identifying feelings and difficulties describing feelings facets. The absence of having an externalized mode of thinking was shown to be the main marker for low alexithymia (Hexel, 2003), suggesting that an externally oriented cognitive style might be a unique predictor of alexithymia.

Recently, alexithymia has been conceptualized from an emotional processing perspective. Emotional processing refers to one's ability to incorporate new information into an existing structure, allowing for either increased or decreased emotional responding (Foa & Kozak, 1986). It is characterized by the modification of one's emotional response to the new information (Foa & Kozak, 1986). The initial step of processing information consists of cue detection and appraisal (Vermeulen, Luminet, & Corneille, 2006). Individuals with alexithymia demonstrate deficits in responding to emotional stimuli (Vermeulen et al., 2006) primarily by demonstrating a low awareness of environmental cues and an incorrect appraisal of events as emotional signals (Taylor et al., 1997). Current research suggests that alexithymia might represent the 'lower tail' of emotional processing abilities (Mattila et al., 2010) and simply represent a phenomenon distributed in the general population (Chen, Xu, Jing, & Chan, 2011).

Emotion regulation and alexithymia

Several studies have investigated the relation between emotion regulation and alexithymia. It is clear that the emotional deficits exhibited by individuals with alexithymia are related to a lack of emotion regulation skills, as alexithymia has been found to significantly predict difficulties in emotion regulation (Stasiewicz et al., 2012). However, the degree of the associations between the individual facets of alexithymia and various emotion regulation skills are unclear. The emotion regulation skills most strongly associated with alexithymia are yet to be fully examined.

Several studies emphasize alexithymia's association with specific cognitive skills required to effectively monitor and self-regulate emotions. For many of these studies, relationships between alexithymia and emotion regulation has been assessed through the use of questionnaires that target cognitive emotion regulation skills (e.g., Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski, Kraaij, & Spinhoven, 2001). Many of these cognitive skills are related to one's ability to identify and label one's own and others' emotional states, the ability to express emotions accurately and make empathic responses to others, and the ability to reflect on emotions and use them in adaptive ways (Mayer & Salovey, 1997). The emphasis on being aware and clear of emotional stimuli for proper emotional processing suggests that the strongest relationships between alexithymia and emotion regulation might pertain to associations between the individual's facets of alexithymia and the 'awareness' and 'clarity' emotion regulation skills. The literature supports this proposal, as alexithymic individuals have been found to exhibit decreased awareness and clarity of their feelings when compared to control groups (Velasco, Fernandez, Paez, & Campos, 2006). Specifically, the

alexithymia facets of 'difficulties identifying feelings' and 'difficulties describing feelings' demonstrated the strongest relationships to the emotion regulation skills of awareness and clarity (Palmieri, Boden, & Berenbaum, 2009). Furthermore, previous research has indicated that emotion regulation and alexithymia have been negatively correlated with several measures of mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Mindfulness is a construct that directly assesses one's ability to be aware of, and accept, one's emotions in the moment in a non-judgemental manner (Kabat-Zinn, Lipworth, & Burney, 1985). These studies suggest that the emotion regulation skills of being aware and clear of one's feelings demonstrate the strongest relationships to the facets of alexithymia.

Conversely, other research emphasizes alexithymia's association with specific behaviour skills required to effectively monitor and self-regulate emotions. For many of these studies, relationships between alexithymia and emotion regulation have been assessed through the use of measures that target behavioural emotion regulation skills (e.g., The Affective Style Questionnaire: Hoffman & Kashdan, 2009). Previous research has linked alexithymia to behaviours such as aggression and reckless behaviour (Beckendam C.C., 1977, as cited in Taylor, 2000), and has emphasized the roles of impulse control, goal-setting, and strategies in explaining maladaptive behaviours. For example, binge eating has often been characterized as a lack of impulse control (Fernández-Aranda et al., 2008). However, it is suggested that these behaviours might occur due to emotional deficits pertaining to emotional processing, as opposed to strictly from a lack of behavioural control. For example, a study conducted by Van Strien and Ouwens (2007) investigated the relationships between alexithymia, emotional eating, and

depression. The difficulties identifying feelings facet of alexithymia was found to partially mediate the relationship between depression and emotional eating. The study suggests that having difficulties in identifying feelings, and simply feeling general negative arousal, propels certain individuals to engage in maladaptive strategies that temporarily reduce their negative feelings (Van Strien & Ouwens, 2007). Since the difficulties identifying feelings facet of alexithymia has been related to a lack of awareness and clarity (e.g., Velasco et al., 2006), it appears that the emotional deficits of awareness and clarity might also underlie maladaptive behaviours.

External locus of control

The literature suggests that while individuals with alexithymia demonstrate physiological arousal and negative affect when shown emotionally distressing stimuli, they appear to lack awareness and clarity of their feelings. It has been suggested that, in order to make sense of their environment, a lack of inner emotional experience (as attained through self-awareness, or understanding one's feelings) can be compensated for by using an externalized mode of thinking (Horney, 1952). The external manner in which individuals with alexithymia interpret the world suggests that they would likely describe their feelings and behaviours in relation to external influences, rather than from internal characteristics. In order to further compare and contrast emotion regulation and alexithymia, their relationship to their theoretical correlate of external locus will be examined.

Locus of control measures the extent to which an individual believes that the outcome of his or her behaviour is contingent on his or her own personal characteristics (internal), versus the degree to which the individual believes the outcome is contingent on

chance, luck, fate, or powerful others (external) (Declerck, Boone, & Bert De Brabander, 2006; Rotter, 1966; 1989). Individuals with an external locus of control believe that they have little influence over events in their life (Rotter, 1966). Subsequently, individuals with an external locus of control would believe that they have little influence over the extent to which their emotions can be controlled or changed. An external locus of control has been associated with emotional distress and, in particular, with anxiety and depression (Holder & Levi, 1988). External locus of control has also been associated with other deficits, pertaining to planning (Wege & Moller, 1995) and demonstrating impulse control difficulties (Brandon & Loftin, 1991).

Although locus of control was originally conceptualized as ranging on a continuum from internal to external, Levenson (1973) conceptualized internal and external loci of control categorically. Levenson further sub-divided external locus of control into two facets: a 'powerful others' locus of control and a 'chance' locus of control. A powerful others locus of control represents the extent to which an individual believes that powerful others, such as God or their social superiors, influence their thoughts and behaviours. Conversely, chance locus of control represents the extent to which individuals believe that their thoughts and behaviours stem from randomly occurring events (Levenson, 1973). Both forms of external loci of control have been related to different psychological difficulties. In particular, a 'powerful others' locus of control has been more strongly associated with passive coping and hostile feelings, and a 'chance' locus of control has been more strongly associated with psychopathology (Brosschot et al., 1994).

External locus of control, emotion regulation, and alexithymia

The majority of the research suggests that emotion regulation abilities are negatively related to external locus of control (e.g., Backenstrass et al., 2010). The relationship between alexithymia and external locus of control has also been studied in a variety of samples. Alexithymia has been positively associated with external locus of control in various undergraduate samples (i.e., Zimmerman et al., 2005), a nonclinical adult sample (Verissimo, Taylor, & Bagby, 2000) and in a clinical population (Taylor et al., 1997). In particular, the externally oriented thinking facet of alexithymia has been more strongly associated with external locus of control than the other facets of alexithymia (e.g. Zimmerman et al., 2005). In sum, the literature suggests that both emotion regulation and alexithymia have been associated with external locus of control. However, it appears that alexithymia might be more related to external locus of control due to their mutual emphases on affected individuals endorsing an externally oriented cognitive style.

Self-Management

In order to further investigate similarities and differences between emotion regulation and alexithymia, their unique relationships to their theoretical correlate of self-management will be examined. Self-management, a form of coping behaviour, is another subordinate process of affect regulation. As described by Kanfer & Karoly (1972) and Bandura (1991), self-management is a pattern of awareness where consciousness is focused on one's behaviour and surroundings. Self-management is associated with the development of skills that are used to regulate behaviours, specifically, problem-solving skills, and the use of action plans to address goals (Bodenheimer et al., 2002). Self-

management training has been used in psychological treatments for depression (i.e., Rehm et al., 1981), and aspects of self-management interventions have been shown to be effective in decreasing health-related behaviours such as smoking (Foxx & Axelroth, 1983).

Self-management is thought to function as a feedback loop comprised of three facets: self-monitoring, self-evaluation, and self-reinforcement. Self-monitoring (SM) occurs when one pays attention to their own thoughts and behaviours, and the conditions under which they occur (Bandura, 1991). Self-monitoring provides an individual with the necessary information to establish realistic goals and evaluate his progress towards those goals (Bandura, 1991). It has been thought to be a prerequisite for the following facets in the feedback loop and has even been found to carry the full weight of treatment change (Rehm et al., 1981). Self-evaluation (SE) occurs when the target behavior is compared to an internalized standard of that behaviour (Mezo, 2009). The individual's behaviour is compared against some standard or goal (Febbraro & Clum, 1998). Self-reinforcement (SR) is self-reward or self-punishment due to the discrepancy found in self-evaluation (Mezo, 2009). The operations of self-monitoring, self-evaluation, and self-reinforcement contribute to enhancing self-management (Mezo, 2009). For example, if an individual wishes to become more physically active, he can employ self-management skills by monitoring his current level of exercise (self-monitoring), evaluating performance towards his chosen exercise regime (self-evaluation), and rewarding himself whenever he take steps towards reaching his exercise goals, such as when he goes to the gym (self-reinforcement). Over time, the individual will develop increased self-control.

Self-management, emotion regulation, and alexithymia

To date, no studies have addressed the specific relationships between these three constructs. However, it appears that being aware of and understanding one's emotions are important components across all three constructs. For example, the self-monitoring facet of self-management emphasises gaining control over activities in order to alter mood (Mezo, 2009). This suggests that the individual must be aware of and understand their emotions if they feel the need to alter their mood in the first place. Therefore, the emotional processing aspects shared between emotion regulation and alexithymia can be conceptualized as also pertaining to self-management.

Apart from the shared emotional processing aspects found across all three constructs, self-management seems to share further similarities with emotion regulation due to their mutual emphasis on goal-setting, strategies, and impulse control. Since self-management was theorized from a behavioural perspective, there appears to be an emphasis on activity across all three of its facets. For example, the underlying theories related to the self-monitoring facet of self-management in a therapeutic intervention for depression included: 1) mood is related to activity, and 2) gaining control over positive activities and increasing them allows one to overcome depression (Rehm et al., 1981). The self-evaluating and self-reinforcing facets also emphasize activities related to setting attainable goals, scheduling activities related to these goals, and controlling behaviour through rewards and punishments (Kanfer & Karoly, 1972; Rehm et al., 1981). Self-management's emphasis on goal-setting, impulse control, and perceived access to proper strategies in order to attain goals appear highly related to skills needed for adequate emotion regulation.

Present Research

The goal of present research is to compare and contrast the relationships between alexithymia and emotion regulation. Since alexithymia has previously been used as a general measure of emotion regulation, it is predicted that all facets of these constructs will be related to each other. In particular, it is predicted that the strongest relationships between alexithymia and emotion regulation will occur between the facets of identifying feelings and describing feelings (alexithymia) and awareness and clarity (emotion regulation; see Figure 2). These facets have been strongly associated with one another in the literature. Furthermore, they have been closely linked to difficulties in emotional processing.

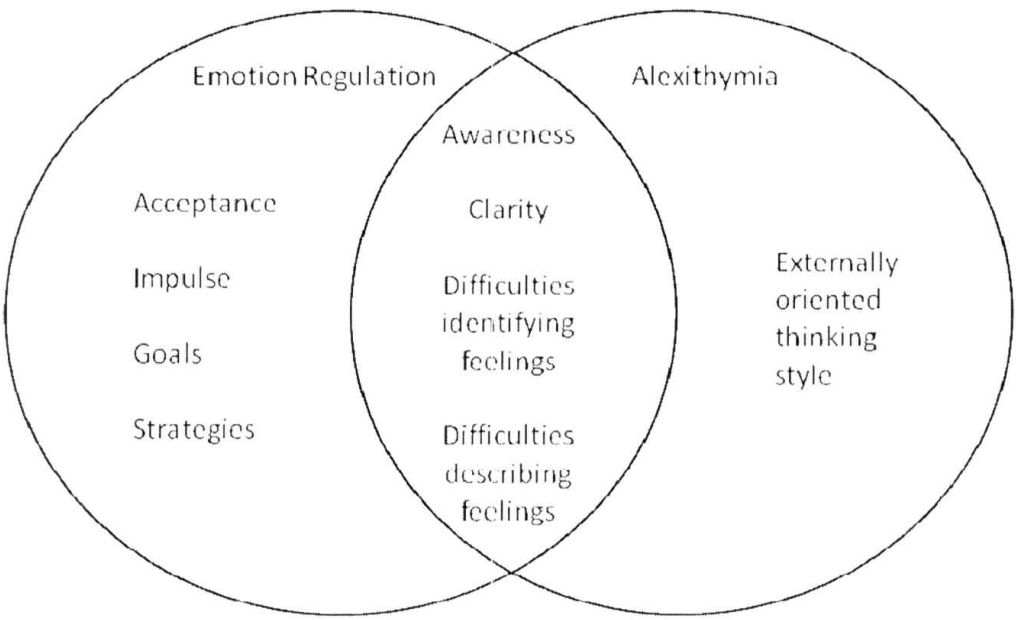

Figure 2. Hypothesis one: Proposed similarities and differences between emotion regulation and alexithymia.

In order to clearly investigate the relation between the emotional deficits in individuals with alexithymia, and their difficulties in using particular emotion regulation skills, it is necessary to compare and contrast the most current measure of alexithymia with the most comprehensive measure of emotion regulation. The revised Twenty-Item Toronto Alexithymia Scale (TAS-20) is a multifaceted measure that is reliable and valid, has been cross-validated in diverse cultures, and has been recognized as the widely used measure of alexithymia (Taylor, 2000). The Difficulties in Emotion Regulation Skills questionnaire (DERS) is the only multidimensional measure that assesses all of the emotion regulation skills needed for optimal emotion regulation. The skills on this measure target cognitive skills, such as accepting one's emotions, and behavioural skills, such as refraining from impulses during times of emotional distress. The DERS differs from previous measures designed to assess emotion regulation, as it was designed by integrating older measures that have been used to assess aspects of emotion regulation skills (Gratz & Roemer, 2004). To date, the TAS-20 and the DERS have been simultaneously employed in a variety of different studies (e.g., during the development of the Affective Styles Questionnaire; Hoffman & Kashdan, 2009). However, no studies to date have considered the relationships specifically between the TAS-20 and the DERS to determine their theoretical similarities and differences. The strength of the associations between emotion regulation skills and the facets of alexithymia will be assessed through the use of bivariate correlation analyses. Furthermore, a principal components analysis will be used to determine patterns in relationships between the individual items of the DERS and the individual items of the TAS-20. Assessing the manner in which the individual items from both measures either aggregate together to form shared

components, or remain distinct from each other and load on separate components, will provide a more nuanced understanding of relationships between these constructs.

In order to further contrast these two constructs, the relative contributions of alexithymia and emotion regulation in predicting theoretical correlates, namely external locus of control and self-management, will be assessed. First, alexithymia and emotion regulation will be used to concurrently predict external locus of control. The literature suggests that alexithymia might be conceptualized as a disorder with emotional deficits in awareness and clarity, thus resulting in individuals endorsing an externally oriented thinking style. Therefore, it is predicted that alexithymia will demonstrate a stronger relationship with external locus of control due to the theoretical relationship between its facet of externally oriented thinking and that of external locus of control.

Second, alexithymia and emotion regulation will be used to concurrently predict self-management. It is thought that emotion regulation, as opposed to alexithymia, will demonstrate a stronger association with self-management. Deficits in emotion regulation seem to encompass both emotional processing variables, such as having awareness and clarity of emotions, as well as active behavioural regulatory variables such as having the ability to goal-set, engage in adaptive strategies, and refrain from impulsivity under times of emotional distress. Therefore, it is hypothesized that emotion regulation will demonstrate a stronger association to self-management, since self-management refers to both how an individual appraises a situation (comparable to both alexithymia and emotion regulation), but also refers to how an individual actively modulates their emotional response tendencies in order to increase regulatory behaviour.

Method

Participants

The sample for this study consisted of undergraduate students, recruited from Memorial University of Newfoundland, in St. John's, Newfoundland and Labrador. Participant recruitment began in introductory psychology classes in the Fall 2011/2012 semester, and continued throughout the winter 2012 semester. Four hundred and eight participants signed up to participate in the online study; however, fifty-four participants were excluded from the following analyses as they were missing data on one or more of the variables of interest. The final sample consisted of 354 participants (261 women, 93 men), ranging in age from 16-47 years old (M = 20.01, SD = 3.34). The majority of participants were in their first year of university (45.3%), with other participants representing second year (26.1%), third year (18.1%), fourth year (5.8%), and part-time students (3.8%). Using Tabachnick and Fidell (2007) as a guideline, it was determined that at least 200 participants were needed to conduct a principal components analysis.

Materials

Several reliable and valid instruments were used concurrently in order to investigate the relationship between emotion regulation and alexithymia. Furthermore, a measure assessing social desirability and a demographic information form were included in the questionnaire package. All instruments were self-report.

Demographic Information Form. The Demographic Information Form assessed demographic characteristics of the sample. Information was gathered with respect to age, gender, ethnicity, marital status, number of children, education, religious affiliation, employment status, and annual income.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The Difficulties in Emotion Regulation Scale (DERS) is a 36-item, self-report measure designed to assess specific deficits in factors related to emotion regulation. The scale assesses the following dimensions: 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 perceived as effective (Gratz & Roemer, 2004). Responses are recorded on a Likert scale ranging from 1-5, where 1 is *almost never*, 2 is *sometimes*, 3 is *about half the time*, 4 is *most of the time*, and 5 is *almost always*. Higher scores reflect greater difficulties in emotion regulation, whereas lower scores reflect greater emotion regulation. Internal consistency for the full scale has been found to be high (Cronbach's $\alpha = .93$), and all of the subscales had adequate internal consistency with Cronbach's α ranging from .80 to .89 (Gratz & Roemer, 2004). The test-retest reliability, observed over a period of 4 to 8 weeks, demonstrated good full-scale reliability (.88, $p < .01$), with correlations for specific subscales ranging from .57 to .89 ($p < .01$). Validity of the DERS has been demonstrated by the significant correlations in the expected direction between all subscales of the DERS and related constructs of interest including the Negative Mood Regulation Scale (NMR; Catanzaro & Mearns, 1990) and the Emotional Expressivity Scale (EES; Kring, Smith, & Neale, 1993).

Revised Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994). The TAS-20 is a 20 item self-report measure that assesses alexithymia on three main factors: difficulty in identifying feelings (TAS-DIF; e.g., "I often don't know why I am angry"), difficulty in describing feelings (TAS-DDF; e.g., "I find it hard to describe

how I feel about people"), and externally oriented thinking style (TAS-EOT; e.g., "I prefer to analyze problems rather than just describe them"). Responses are recorded on a five point Likert scale, with 1 representing '*strongly disagree*' and 5 representing '*strongly agree'*. Higher scores indicate higher levels of alexithymia. The psychometric properties of the TAS-20 are strong. There is acceptable internal consistency for the full scale (Cronbach's $\alpha = .81$) as well as for each subscale (F1 = .78, F2 = .75, F3 = .66) (Bagby, Parker, & Taylor, 1994). The test-retest reliability of the TAS-20 was strong ($r = .77$, $p < .01$). The validity of the TAS-20 has been demonstrated as it correlates strongly and in the expected direction with several reliable and well-validated measures including the Psychological Mindedness Scale (PMS; $r = -.68$) and the Need for Cognition Scale (NFC; $r = -.55$).

Internal, Powerful Others, and Chance Scales (IPC Scales; Levenson, 1973). The IPC scales determine the degree to which individuals believe that events in their life are controlled by: their own actions (I; e.g., "I can pretty much determine what will happen in my life"), powerful others (P; e.g., "Getting what I want means I have to please those people above me"), or chance or fate (F, e.g., "When I get what I want, it's usually because I am lucky"). Each scale consists of eight items and is recorded on a 6-point Likert scale, with -3 representing '*strongly disagree*' and +3 representing '*strongly agree*'. The scales demonstrates Kuder-Richardson internal consistencies of .72 - .78 for the external scales. It also demonstrates good convergent validity, and strong discriminant value when evaluated opposite the Marlowe-Crowne Social Desirability Scale.

Self-Control and Self-Management Scale (SCMS; Mezo, 2009). The SCMS is a 16-item self-report measure that assesses self-control and self-management on three factors: Self-Monitoring (SM; e.g., "I become very aware of what I am doing when I am working towards a goal"), Self-Evaluating (SE; e.g., "The goals I achieve do not mean much to me") and Self-Reinforcing (SR; e.g., "I give myself something special when I make some progress"). Responses are recorded on a 6-point Likert scale (0 = *very undescriptive of me*, 5 = *very descriptive of me*). Higher scores indicate greater self-control and self-management skills. The full scale SCMS demonstrated high internal reliability (α = .81) with coefficient alphas for all subscales ranging from .74 to .81 (Mezo, 2009). Test-retest reliabilities ranged from r = .62 to r = .65 for the full scale and subscale (Mezo, 2009). The SCMS showed significant moderate to high associations with instruments used as convergent construct validity measures including the Self-Control Questionnaire (SCQ; Rehm et al., 1981), the Frequency of Self-Reinforcement Questionnaire (FSRQ; Heiby, 1982), and the Cognitive Self-Management test (CSM; Rude, 1986), with correlations at .65, .45, and .57, respectively (Mezo, 2009).

The Marlowe-Crowne Social Desirability Scale (MCSD; Crowne and Marlow, 1960). The MCSD is a 33-item instrument designed to assess an individual's tendency to act in a socially desirable manner. Higher scores represent a more socially desirable response. The MCSD contains 33 true-false items (i.e., "I like to gossip at times"). The instrument demonstrated high internal consistency (Cronbach's α = .88) with a high test-retest reliability over a one-month period (r = .89) (Crowne & Marlowe, 1960).

Procedure

Ethical consent for this study was obtained from the Interdisciplinary Committee on Ethics in Human Research at Memorial University in St. John's, Newfoundland. The primary researcher was granted permission by psychology professors to present a five-minute presentation at the beginning of each class detailing the study. A script was used during the presentation (see Appendix G). During the presentation, students were informed that a study regarding 'emotions in undergraduate students' was underway and that participation in the study was completely voluntary. Students were informed that the entire study was confidential, and their names would not appear on any of the questionnaire packages nor on any written documents pertaining to the study. The students were informed that the study would take approximately 15 minutes to complete online. Students were informed that participation in the study would not affect their coursework in any way; however, in order to encourage participation, an incentive of an extra two percent bonus mark towards their first midterm exam was offered. Interested students were encouraged to put their name and university e-mail address on a sign-up sheet that would be left with each professor. After class, the professor placed the sign-up sheet in the primary researcher's mailbox. Upon receiving all sign-up sheets, a database with only the students' e-mail addresses, and not their full names, was created in order to increase anonymity throughout the research process. A secure URL that contained the online battery was sent out to all e-mail addresses on the sign-up sheet. The sign-up sheets were then stored in a locked filing cabinet.

The first page of the online battery was the consent form. The student had to consent to the terms of agreement before gaining access to the rest of the battery. At this

point, students were reminded that they were free to withdraw from the study at any time. Upon consenting to the study, students were directed to the second screen that contained the demographic form and the measures. The measures in the battery were counterbalanced in order to control for carry-over effects. After completing the last measure, students were directed to a window that thanked them for participating in the study. Students were given a contact number for the primary researcher and were encouraged to contact the primary researcher with any questions they might have. They were also encouraged to contact the University Counselling Centre if they felt any distress upon completing the study.

Results

Descriptive Statistics and Reliability of Study Instruments

Descriptive statistics and reliability estimates were assessed for all of the study instruments. Results are presented in Table 1.

Table 1

Descriptive statistics and reliability estimates of the Difficulties in Emotion Regulation Scale (DERS), the Twenty-Item Toronto Alexithymia Scale (TAS-20), the Self-Control and Self-Management Scale (SCMS), the Internality, Powerful Others, and Chance Scales – Powerful Others (IPC-P), the Internality, Powerful Others Chance Scale – Chance (IPC-C), and the Marlowe-Crowne Social Desirability Scale (MCSD) (N = 357)

	Mean	SD	Range	Coefficient alpha
DERS	84.46	22.89	40-170	.94
TAS-20	48.12	10.81	23-84	.84

SCMS	56.78	10.09	27-80	.83
IPC-P	18.47	7.56	0-46	.79
IPC-C	18.60	7.58	0-47	.77
MCSD	17.32	5.12	2-30	.76

Note. DERS = Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004); TAS-20 = The Twenty-Item Toronto Alexithymia Scale (Bagby, Taylor, & Parker, 1994); SCMS = Self-Control and Self-Management Scale (Mezo, 2009); IPC = Internality, Powerful Others, and Chance Scales (Levenson, 1973); MCSD = The Marlowe-Crowne Social Desirability Scale (Crowne and Marlowe, 1960).

Reliability analyses were conducted on all study instruments used in the current research. The coefficient alphas used in this study ranged from .76 to .94, indicating moderate to high internal consistencies (Nunnally, 1978). In order to assess preliminary relationships between the study variables, bivariate correlations were conducted between the total scores for all of the study variables. As expected, all variables were significantly correlated in the expected directions. The strongest relationship was between the DERS and the TAS-20, providing evidence for the proposed overlap between the two constructs. Results are presented in Table 2.

Table 2

Bivariate correlations of the main study variables including the Difficulties in Emotion Regulation Scale (DERS), the Twenty-Item Toronto Alexithymia Scale (TAS-20), the Self-Control and Self-Management Scale (SCMS), the Internality, Powerful Others, and Chance Scales – Powerful Others (IPC-P), and the Internal Powerful Others Chance Scale – Chance (IPC-C)

(N = 357)

	DERS	TAS-20	SCMS	IPC_PO

TAS-20	.60*	-		
SCMS	-.33*	-.35*	-	
IPC_PO	.29*	.34*	-.27*	-
IPC_CH	.30*	.36*	-.26*	.60*

Note. DERS = Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004); TAS-20 = The Twenty-Item Toronto Alexithymia Scale (Bagby, Taylor, & Parker, 1994); SCMS = Self-Control and Self-Management Scale (Mezo, 2009); IPC = Internality, Powerful Others, and Chance Scales (Levenson, 1973). Bonferroni correction used for multiple comparisons (.05/10).
* $p < .005$ (two-tailed).

Comparing and Contrasting Emotion Regulation and Alexithymia

In order to gain a preliminary analysis of the emotional deficits that the participants endorsed the most and the least, means and standard deviations of all facets and skills of these two constructs were investigated. Results are presented in Table 3.

Table 3

Means and standard deviations of the emotion regulation skills in the Difficulties in Emotion Regulation Scale (DERS) and the facets of the Twenty-Item Toronto Alexithymia Scale (TAS-20) (N = 357)

Facet	Mean	SD
DERS		
Nonacceptance	13.16	5.68
Strategies	17.14	7.30
Goals	16.40	5.10
Impulse	11.52	5.24
Awareness	15.20	4.70
Clarity	11.05	3.80

TAS-20		
Difficulties Identifying Feelings	15.67	5.63
Difficulties Describing Feelings	13.28	4.09
Externally Oriented Thinking	19.17	4.04

In order to assess the strength of the relationships between the individual facets of alexithymia and emotion regulation, 18 bivariate correlations were performed (see Table 4). A bonferroni correction of $p < .003$ was used to control for the multiple comparisons. The difficulties identifying feelings facet was significantly correlated with all emotion regulation skills. The difficulties describing feelings facet was significantly correlated with almost all emotion regulation skills, as there was no relationship between this facet of alexithymia and the emotion regulation skills of goals. The externally oriented thinking facet of alexithymia was significantly correlated with only three emotion regulation skills: awareness, strategies and clarity. There were no relationships between the externally oriented thinking facet of alexithymia and the emotion regulation skills of nonacceptance, goals, and impulse.

The difficulties identifying feelings facet of alexithymia demonstrated the strongest relationship with most emotion regulation skills, while the externally oriented thinking facet of alexithymia demonstrated the weakest relationship with most emotion regulation skills. The clarity skill of emotion regulation demonstrated the strongest relationships with all three facets of alexithymia, while the goals skills of emotion regulation demonstrated the weakest relationships with all three facets of alexithymia. Overall, the strongest relationship between all individual skills and facets occurred

between the clarity skill of emotion regulation and the difficulties identifying feelings facet of alexithymia.

Table 4

Correlations between the subscales of DERS and TAS-20 (N = 357)

		Alexithymia	
	Difficulties Identifying Feelings	Difficulties Describing Feelings	Externally Oriented Thinking Style
Emotion Regulation			
Nonacceptance	.48*	.35*	.08
Goals	.28*	.11	.07
Impulse	.48*	.25*	.09
Awareness	.30*	.44*	.46*
Strategies	.53*	.33*	.14*
Clarity	.68*	.61*	.33*

Note. Bonferroni correction used for multiple comparisons (.05/18).
*$p < .003$ (two-tailed).

Principal components analysis. In order to gain a greater understanding of the relationships between alexithymia and emotion regulation, a Principal Components Analysis (PCA) was employed. The measures used were the Difficulties in Emotion Regulation Scale (DERS) and the Twenty-Item Toronto Alexithymia Scale (TAS-20). The analysis was performed using the Statistical Packages for Social Sciences (SPSS) software. Preliminary steps for a PCA analysis were followed as outlined by Tabachnick and Fidell (2007).The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was used to

determine whether the partial correlations are large enough to warrant a PCA analysis. The test resulted in a value of .925 which was well above the recommended level of .6 (Tabachnick & Fiddell, 2007). Bartlett's Test of Sphericity was used to determined whether the correlation matrix was an identity matrix. The test resulted in a significant finding (p <.001), supporting the use of the PCA analysis. A Direct Oblimin with Kaiser normalization rotation was used to interpret the factor loadings, as the strong correlations found within the factor matrix indicated the need for an oblique rotation (Tabachnick & Fidell, 2007).

The initial PCA yielded 11 factors greater than one eigenvalue. The scree plot indicated a four factor solution (see Figure 1). The analysis was re-run with setting a four factor criteria. The interpretation of the pattern matrix output followed the rule of thumb put forth by Tabachnick and Fidell (2007), whereby variables were only interpreted when loadings were .32 or higher. Four items from the externally oriented thinking facet of alexithymia were excluded from the analysis, as they did not exceed the .32 factor loading cut-off as recommended by Tabachnick and Fidell (2007).

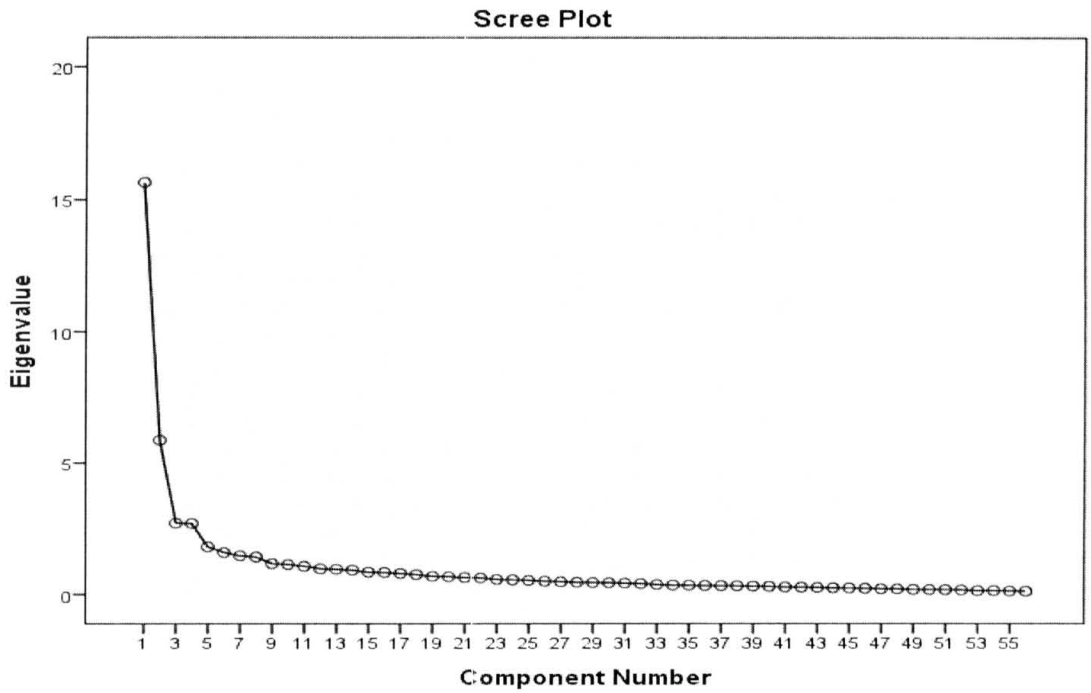

Figure 1. Scree plot of the principal components of emotion regulation and alexithymia

Component 1 consisted of 21 items. 20 items were from the emotion regulation measure; eight items from the strategies subscale, six items were from the impulse subscale, and six items were from the nonacceptance subscale. The one item from the alexithymia measure was from the difficulties identifying feelings facet. Component 1 had an eigenvalue of 15.65 and accounted for 27.94 % of the variance. Component 2 consisted of 11 items. Seven items were from the emotion regulation measure; six items from the awareness subscale, and one item was from the clarity subscale. Four items from the alexithymia measure were from the externally oriented thinking facet. Component 2 had an eigenvalue of 5.86 and accounted for 10.47% of the variance. Component 3 consisted of 15 items. 11 items were from the alexithymia measure; seven items from the difficulty identifying feelings facet, and four items from the difficulties describing

feelings facet. Four items from the emotion regulation measure were from the clarity subscale. Component 3 had an eigenvalue of 2.71 and accounted for 4.85% of the variance. Component 4 consisted of five items from the emotion regulation measure. All five items were from the goals subscale. Component 4 had an eigenvalue of 2.70 and accounted for 4.80% of the variance. With the exception of one item (TAS-14), all of the items from the TAS-20 loaded onto component two and three; hence, components two and three appeared to capture the strongest relationships between alexithymia and emotion regulation. Component loadings are presented in Table 5. Items that cross-loaded (met the criteria of scoring above .32 on more than one component) are also reported in Table 5.

Table 5

Component loadings of items from emotion regulation (DERS) and alexithymia (TAS-20) – rotated scores (N = 357)

Items	Subscale	Components			
		1	2	3	4
D 14: When I'm upset, I become out of control.	Impulse	**.80**	.10	-.17	.07
D 32: When I'm upset, I lose control over my behaviours.	Impulse	**.78**	.14	.03	.03
D 21: When I'm upset, I feel ashamed with myself for feeling that way.	Nonacceptance	**.76**	-.03	-.13	-.12
D 19: When I'm upset, I feel out of control.	Impulse	**.75**	-.01	.01	.13
D 28: When I'm upset, I believe there is nothing I can do to make myself	Strategies	**.75**	.17	-.00	.11

feel better.					
D 15: When I'm upset, I believe that I will remain that way for a long time.	Strategies	**.75**	.18	-.08	.12
D 29: When I'm upset, I become irritated with myself for feeling that way.	Nonacceptance	**.74**	-.11	-.17	-.06
D 03: I experience my emotions as overwhelming and out of control.	Impulse	**.71**	-.08	-.13	-.03
D 16: When I'm upset, I believe that I'll end up feeling very depressed.	Strategies	**.71**	.08	.90	.07
D 27: When I'm upset, I have difficulty controlling my behaviours.	Impulse	**.71**	.08	-.00	.10
D 35: When I'm upset, it takes me a long time to feel better.	Strategies	**.69**	.06	-.09	.10
D 36: When I'm upset, my emotions feel overwhelming.	Strategies	**.68**	-.15	-.09	.25
D 31: When I'm upset, I believe that wallowing in it is all I can do.	Strategies	**.67**	.07	.09	.23
D 30: When I'm upset, I start to feel very bad about myself.	Strategies	**.67**	-.07	-.10	.18
D 11: When I'm upset, I become angry with myself for feeling that way.	Nonacceptance	**.66**	-.10	-.16	-.05
D 12: When I'm upset, I become embarrassed for feeling that way.	Nonacceptance	**.66**	-.04	-.18	-.16
D 25: When I'm upset, I feel guilty for feeling that way.	Nonacceptance	**.62**	-.14	-.26	-.13
D 23: When I'm upset, I feel like I am weak.	Nonacceptance	**.61**	-.14	-.22	.06
T 14: I often don't know why I am angry.	Difficulty identifying	**.45**	.05	**-.37**	-.04

	feelings				
D 24: When I'm upset, I feel like I can remain in control of my behaviors. (R)	Impulse	**.41**	.23	-.10	.18
D 22: When I'm upset, I know that I can find a way to eventually feel better. (R)	Strategies	**.40**	**.37**	.00	.15
T 16: I prefer to watch "light" entertainment shows rather than psychological dramas.	Externally oriented	-.20	.09	-.17	.20
D 06: I am attentive to my feelings. (R)	Awareness	-.01	**.79**	-.03	-.01
D 08: I care about what I am feeling. (R)	Awareness	.03	**.74**	-.05	-.07
D 02: I pay attention to how I feel. (R)	Awareness	.03	**.70**	-.10	-.03
D 34: When I'm upset, I take time to figure out what I'm really feeling. (R)	Awareness	-.03	**.65**	.03	.03
T 10: Being in touch with emotions is essential. (R)	Externally Oriented	.07	**.64**	.10	-.19
D 10: When I'm upset, I acknowledge my emotions. (R)	Awareness	-.11	**.61**	**-.**10	.01
T 19: I find examination of my feelings useful in solving personal problems. (R)	Externally Oriented	.03	**.55**	.06	-.02
D 17: When I'm upset, I believe that my feelings are valid and important (R)	Awareness	-.00	**.51**	-.07	-.18
T 15: I prefer talking to people about their daily activities than their feelings.	Externally Oriented	-.03	**.41**	-.05	.10
D 01: I am clear about my feelings.	Clarity	.21	**.38**	-.28	.03

(R)					
T 05: I prefer to analyze problems rather than just describe them. (R)	Externally Oriented	-.03	**.36**	-.04	.01
T 18: I can feel close to someone, even in moments of silence. (R)	Externally oriented	.05	.31	-.03	.06
T 09: I have feelings that I can't quite identify.	Difficulty identifying feelings	.08	-.08	**-.76**	.06
T 02: It is difficult for me to find the right words for my feelings.	Difficulty describing feelings	-.04	.08	**-.74**	-.02
T 13: I don't know what's going on inside me.	Difficulty identifying feelings	.14	-.04	**-.72**	.03
T 07: I am often puzzled by sensations in my body.	Difficulty identifying feelings	.05	-.19	**-.67**	.05
T 01: I am often confused about what emotion I am feeling.	Difficulty identifying feelings	.11	.06	**-.65**	.10
T 06: When I am upset, I don't know if I am sad, frightened, or angry.	Difficulty identifying feelings	.13	.00	**-.65**	.06
D 07: I know exactly how I am feeling. (R)	Clarity	.08	.33	**-.53**	-.01
D 05: I have difficulty making sense out of my feelings.	Clarity	.31	.13	**-.52**	-.05
D 09: I am confused about how I feel.	Clarity	**.42**	-.02	**-.51**	-.01
T 11: I find it hard to describe how I feel about people.	Difficulty describing feelings	.-04	.04	**-.50**	.04

T 04: I am able to describe my feelings easily (R).	Difficulty describing feelings	.01	.27	**-.48**	-.10
T 03: I have physical sensations that even doctors don't understand.	Difficulty identifying feelings	.09	-.06	**-.48**	-.04
D 04: I have no idea how I am feeling.	Clarity	**.32**	.21	**-.45**	-.07
T 12: People tell me to describe my feelings more.	Difficulty describing feelings	.13	.17	**-.45**	-.10
T 17: It is difficult for me to reveal my innermost feelings even to close friends.	Difficulty identifying feelings	.03	.31	**-.33**	-.02
T 8: I prefer to just let things happen rather than to understand why they turned out that way.	Externally Oriented	-.05	.17	-.31	.07
T 20: Looking for hidden meanings in movies or plays distracts from their enjoyment.	Externally Oriented	-.18	.09	-.24	.20
D 18. When I'm upset, I have difficulty focusing on other things.	Goals	.22	-.16	.00	**.79**
D 26. When I'm upset, I have difficulty concentrating.	Goals	.22	-.12	-.03	**.79**
D 20. When I'm upset, I can still get things done. (R)	Goals	-.02	.04	-.04	**.79**
D 13. When I'm upset, I have difficulty getting work done.	Goals	.25	-.10	.00	**.76**
D 33. When I'm upset, I have difficulty thinking about anything else.	Goals	**.40**	-.10	.04	**.67**

Note. DERS = Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004); TAS-20 = The Twenty-Item Toronto Alexithymia Scale (Bagby, Taylor, & Parker, 1994). 'R'

in parentheses indicates a reversed scored item. Component loadings and cross-loadings are bolded.

Emotion Regulation and Alexithymia's relationships to External Locus of Control and Self-Management

To assess the unique contributions of emotion regulation and alexithymia in predicting the related constructs of external locus of control and self-management, hierarchical regressions were performed. For all regression analyses, the independent variables were initially assessed for collinearity. Results of the collinearity tolerance (6.17) support that the estimated βs of the coefficients for the dependent variables were well established in the regression models.

The first two regressions were conducted using emotion regulation (DERS) and alexithymia (TAS-20) as the independent variables, and the powerful others scale from the internality, powerful others, and chance scales (IPC-P) as the dependent variable. For the first regression, emotion regulation was entered in the first step. Emotion regulation skills accounted for 8.7% of the variance in powerful others scores (F (1,352) = 33.64, p < .001). Alexithymia was entered in the second step. The percentage change in variance accounted for was 4% (ΔF (2,354) = 16.25, p < .001), rendering a total of 12.8% (F (2,351) = 25.68, p < .001) of variance accounted for in powerful others scores (see Table 6 for regression coefficients). Both of the predictors were statistically significant. For the second regression, alexithymia was entered in the first step. The percent variance in powerful others scores accounted for by alexithymia was 11.4%, and was statistically significant (F (1,353) = 43.42, p < .001). Emotion regulation was entered in the second step. The change in percent variance accounted for was 1.3% (ΔF (2,351) = 5.37, p = .02), rendering a total of 12.8% (F (2,351) = 25.68, p < .001) of variance accounted for in

powerful others scores (see Table 8 for regression coefficients). Both emotion regulation and alexithymia accounted for unique variance in powerful others scores. However, as predicted, alexithymia was a stronger predictor of having a powerful others orientation than emotion regulation.

Table 6

Regression analyses predicting external locus of control (powerful others) from both alexithymia and difficulties in emotion regulation (N = 357)

	B	*SE*	*β*	*t*
TAS-20				
Step 1				
DERS	.10	.02	.29	5.80*
Step 2				
DERS				
TAS-20	.18	.04	.25	4.03*
DERS				
Step 1				
TAS-20	.24	.03	.34	6.74*
Step 2				
TAS-20				
DERS	.05	.02	.14	2.32*

Note. Dependent variable = Powerful Others scale (IPC-P). DERS = Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004) ; TAS-20 = The Twenty-Item Toronto Alexithymia Scale (Bagby, Taylor, & Parker, 1994); IPC = Internality, Powerful Others, and Chance scales (Levenson, 1973).
*$p < .05$, (two-tailed).

The third and fourth regressions were conducted using the emotion regulation (DERS) and alexithymia (TAS-20) scales as the independent variables, and the chance scale from the internality, powerful others, and chance scales (IPC-C) as the dependent variable. For the third regression, emotion regulation was entered in the first step. Emotion regulation skills accounted for 9.1% of the variance in chance scores (F (1,352) = 35.18, $p < .001$). Alexithymia was entered in the second step. The percentage change in

variance accounted for was 5% (ΔF (2,351) = 20.53, $p < .001$), rendering a total of 14.1% (F (2,352) = 28.83, $p < .001$) of variance accounted for in chance scores (see Table 7 for regression coefficients). Both of the predictors were statistically significant. For the fourth regression, alexithymia was entered in the first step. The percent variance in chance scores accounted for by alexithymia was 13% and was statistically significant (F (1,353) = 52.49, $p < .001$). Emotion regulation was entered in the second step. The change in percent variance accounted for was 1.1% (ΔF (2,351) = 4.63, $p = .02$), rendering a total of 14.1% (F (2,354) = 28.83, $p < .001$) of variance accounted for in chance scores (see Table 7 for regression coefficients). Both emotion regulation and alexithymia accounted for unique variance in chance scores. However, as predicted, alexithymia was a stronger predictor of having a chance orientation than emotion regulation.

Table 7

Regression analyses predicting external locus of control (chance) from both alexithymia and difficulties in emotion regulation (N = 357)

	B	*SE*	*β*	*t*
TAS-20				
Step 1				
DERS	.10	.02	.30	5.93*
Step 2				
DERS				
TAS-20	.20	.04	.28	4.53*
DERS				
Step 1				
TAS-20	.25	.03	.36	7.24*
Step 2				
TAS-20				
DERS	.04	.02	.13	2.15*

Note. Dependent variable = Chance Scale (IPC-C). DERS = Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004) ; TAS-20 = The Twenty-Item Toronto Alexithymia Scale (Bagby & Parker, 1994) ; IPC = Internality, Powerful Others, and Chance Scales (Levenson, 1973).
*$p < .05$, (two-tailed).

The fifth and sixth regressions were conducted using emotion regulation (DERS) and alexithymia (TAS-20) as the independent variables, and self-management (SCMS) as the dependent variable. For the fifth regression, emotion regulation was entered in the first step. Emotion regulation skills accounted for 10.8 % of the variance in self-management skills (F (1,352) = 42.56, $p < .001$). Alexithymia was entered in the second step. The percentage change in variance accounted for was 3.9% (ΔF (1,351) = 15.85, $p < .001$), rendering a total of 14.6% (F (1,354) = 30.10, $p < .001$) of variance accounted for in self-management skills (see Table 8 for regression coefficients). For the sixth regression predicting self-management, alexithymia was entered in the first step. The percent variance in self-management scores accounted for by alexithymia was 12.5 %, and was statistically significant (F (1,352) = 50.49, $p < .001$). Emotion regulation was entered in the second step. The change in percent variance accounted for was 2.1% (ΔF (1,351) = 8.62, $p = .004$), rendering a total of 14.6% (F (1,351) = 30.10, $p < .001$) of variance accounted for in self-management skills (see Table 8 for regression coefficients). The two regression analyses demonstrated that both emotion regulation skills and alexithymia account for unique variance in self-management skills. Contrary to the hypothesis, alexithymia was a stronger predictor of self-management skills than emotion regulation; however, the difference in predictive value was minimal.

Table 8

Regression analyses predicting self-management from both alexithymia and difficulties in emotion regulation (N = 357)

	B	*SE*	*β*	*t*
TAS-20				
Step 1				
DERS	-.14	.022	-.33	-6.52*
Step 2				
DERS				
TAS-20	-.23	.058	-.24	-3.98*
DERS				
Step 1				
TAS-20	-.33	.05	-.35	-7.12*
Step 2				
TAS-20				
DERS	-.08	.03	-.18	-2.94*

Note. Dependent variable = Self-Management (SCMS); DERS = Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004); TAS-20 = The Twenty-Item Toronto Alexithymia Scale (Bagby & Parker, 1994); SCMS = Self-Control and Self-Management Scale (Mezo, 2009).
*$p < .05$, (two-tailed).

Discussion

The purpose of the present research was to clearly delineate the relationships between emotion regulation and alexithymia within the emotion regulation literature and to consider their relationships with related constructs. The strong theoretical overlap between emotion regulation and alexithymia warranted research aimed at examining and clearly defining the similarities and differences shared across both constructs. Obtaining precise operational definitions of each construct was important to avoid misinterpreting prior literature and in designing future research. Furthermore, the degree to which emotion regulation and alexithymia predicted related theoretical correlates (i.e. locus of

control and self-management) was assessed in order to highlight differences between both constructs.

The relationships were examined in a non-clinical sample of undergraduate students. It was observed that (1) emotion regulation and alexithymia were strongly related, (2) the difficulties identifying and describing feelings facets of alexithymia demonstrated the strongest relationships with emotion regulation, and the emotion regulation skills of acceptance, clarity and strategies demonstrated the strongest relationships with alexithymia, (3) alexithymia was more strongly related to externally oriented thinking (powerful others and chance) than emotion regulation, and (4) alexithymia was more strongly related to self-management than emotion regulation, although this difference was the least of the three examined. With the exception of the fourth observation, these results were consistent with the theory based hypotheses.

The first aim of this investigation was to examine the relationships between all individual skills of emotion regulation and all facets of alexithymia. Previous research has indicated that emotion regulation and alexithymia are associated with similar difficulties, such as demonstrating a strong association to the affective disorders (Dennis, 2007; Taylor, 2000), as well as variables pertaining to decreased well-being. As alexithymia has been thought to reflect difficulties in emotion regulation skills, it was hypothesized that all emotion regulation skills and all facets of alexithymia would be strongly associated with one another. Accordingly, bivariate correlations were performed between all skills of emotion regulation and all facets of alexithymia. Emotion regulation and alexithymia were related across most comparisons. The strong bivariate correlations support previous research that suggests that individuals with alexithymia have difficulties

regulating their emotions.

The varying degrees of the associations between emotion regulation skills and the individual facets of alexithymia were assessed. First, the strength of the comparisons between emotion regulation skills and the construct of alexithymia was explored. The emotion regulation skills that were most associated with the entire construct of alexithymia pertained to being clear and aware of one's emotions, and being able to use strategies in a flexible manner, under times of emotional distress. In particular, the emotion regulation skill of having clarity of one's feelings demonstrated the strongest relationship to alexithymia. These results suggest that individuals with alexithymia have difficulties with these specific emotion regulation skills, especially with having clarity of their feelings. Second, the strength of the comparisons between the individual facets of alexithymia and the construct of emotion regulation was assessed. The difficulties identifying and describing feelings facets of alexithymia demonstrated the strongest relationships to the entire construct of emotion regulation. In particular, the difficulties identifying feelings facet of alexithymia demonstrated the strongest relationship to emotion regulation. These results suggest that individuals who lack the abilities to clearly identify and describe their feelings will have greater difficulties regulating their emotions. Overall, these results suggest that emotion regulation and alexithymia represent similar cognitive emotion processing deficits pertaining to identifying and being clear of one's feelings.

Previous research indicates that the inability to describe one's emotions might lead to the unpleasant emotions associated with increased negative affect (Baer et al., 2006), which is a risk factor for engaging in maladaptive behaviours such as non-suicidal

self-injury (Selby et al., 2008) in order to feel better. The results from the current study support previous research, and in addition suggest that because individuals with alexithymia are unclear about their emotions, they may have difficulties knowing what strategy to use to make themselves feel better under times of emotional distress. Thus, they may have an increased risk for choosing more maladaptive strategies. It is also possible that individuals with alexithymia have greater difficulties in engaging in flexible forms of strategy use due to their restricted imaginal capacities. Individuals with greater degrees of alexithymia might simply think less about alternative types of strategy use, or are unwilling to experiment using more adaptive strategies. This may result from fear that these strategies might not be as helpful at reducing negative affect during times of distress. It is possible that these individuals might engage in more adaptive emotion regulation strategies if they had the opportunity to learn and practice adaptive strategy use. Future training programs aimed at teaching and training individuals with alexithymia to use more adaptive strategies to regulate their emotions might prove to be beneficial at encouraging more adaptive behaviours.

The results from the bivariate correlations suggest that the externally oriented facet of alexithymia demonstrated the weakest relationship to emotion regulation skills. In particular, there was no relationship found between the externally oriented facet of alexithymia and the emotion regulation skills of nonacceptance of emotional response, goal-setting, and impulse control. This finding might be explained by the conceptualization of alexithymia as reflecting deficits in the cognitive processing of emotions. As goal-setting and impulse control reflect more of 'behavioural' self-regulation skills, this finding might provide further support of alexithymia being a

disorder primarily related to cognitive emotional processing deficits.

Although previous research has provided evidence for both constructs representing similar emotional deficits, previous measures of emotion regulation and alexithymia employed in past research did not represent the full content validity of these constructs. Thus, specific relationships between items, facets, and skills were not yet fully explored. To further investigate the relationships between emotion regulation and alexithymia, a principal components analysis was used to assess patterns in the relationship between the two constructs. The principal components analysis provided a four factor solution. From the alexithymia measure, all of the items loaded onto components two and three, save two items that loaded onto component one. However, the two items that loaded onto component one also cross-loaded with either component two or three, thus suggesting that the items are not clearly delineated. All of the emotion regulation items that loaded onto components two and three pertained to having 'awareness' and 'clarity' skills. The principal components analysis mirrors the findings with the bivariate correlations, as both analyses suggest that the emotion regulation skills most strongly related to alexithymia pertain to being aware and clear of one's emotions. In contrast, the remaining items of the emotion regulation scale loaded on factors one and four. Specifically, the items from the goals subscale loaded exclusively on component four, and items from the impulse and strategies subscales loaded on component one. These results indicate that alexithymia and emotion regulation share specific emotional components; however, the emotion regulation construct also includes additional components (e.g. goal-setting).

Of the 56 items, four items failed to load on any of the four factors. These items

failed to adequately meet the .32 loading criteria as set forth by Tabachnick and Fidell (2007). This finding further supports previous research that suggests that the externally oriented thinking facet of alexithymia demonstrates the weakest relationship with the other two facets of alexithymia (i.e., difficulties identifying feelings and difficulties describing feelings). Furthermore, this finding suggests that the externally oriented thinking facet of alexithymia demonstrates the weakest relationship to general emotion regulation skills. Alternatively, this finding might be explained by the sample characteristics. Since externally oriented thinking has been found to be a unique predictor of high alexithymia (Hezel, 2003), it is possible that the undergraduate sample did not endorse a high enough degree of externally oriented thinking, and subsequently high enough levels of alexithymic characteristics, for these four externally oriented thinking items to significantly load onto the principal components analysis. Future studies could assess whether these relationships remain consistent among individuals with clinical levels of alexithymia. Overall, the results so far provide a context in which we can compare and contrast alexithymia and emotion regulation. In line with previous literature, alexithymia is strongly related to having difficulties regulating emotions. Both the bivariate correlations and the principal components analysis provided insight into the strength of the relationships between the particular facets of each construct. In sum, both analyses suggest that alexithymia is primarily representative of having difficulties in being aware and clear of one's feeling.

These results provide a context for which we can define alexithymia's place within the emotion regulation literature. As previously stated, emotion regulation is a mechanism associated with six main emotion regulation skills (i.e., awareness, clarity,

goals, impulse-control, strategies, and acceptance). All emotion regulation skills provide individuals with the ability to modify their emotional reactions at any of the four modals associated with the mechanism of emotion regulation. The literature emphasizes the interplay across all four modals such that, if there are deficits in the functioning of any of the modals, the entire system is disrupted and difficulties with emotion regulation occur. Alexithymia is a personality trait where individuals experience, to a greater or lesser degree, difficulties with emotion regulation. This research suggests that alexithymia is primarily associated with deficits in being aware and clear of one's emotions. These emotional deficits would disrupt one (or more) of the emotion regulation modals, and in turn disrupt the entire mechanism of emotion regulation.

The results so far suggest that emotion regulation and alexithymia are similar in the sense that they are both associated with emotion regulation skills. However, it can be contended that they differ in the underlying manner in which they measure difficulties in emotion regulation skills. Emotion regulation can be thought of as a general measure of one's ability to engage in adequate emotion regulation skills. Conversely, alexithymia can be thought of as a more specific measure of emotion regulation skills pertaining to difficulties with two main emotion regulation skills (i.e., awareness and clarity). Since these skills pertain to the cognitive component of emotion regulation abilities, these results further support that alexithymia is primarily a disorder of cognitive emotional processing.

In order to gain a deeper understanding of differences between emotion regulation and alexithymia, both constructs were examined as predictors of theoretical correlates of external locus of control and self-management. As predicted, both alexithymia and

emotion regulation accounted for unique variance in external locus of control and self-management scores. The observation that emotion regulation and alexithymia were both significant predictors of external locus is theoretically consistent with prior regulation literature, as these constructs have all been associated with decreased well-being.

The degree to which alexithymia and emotion regulation predicted external locus of control and self-management also supported the proposed hypotheses. As expected, alexithymia was a stronger predictor of endorsing an external locus of control than emotion regulation. This result was not surprising, as it is theoretically consistent that individuals who endorse an externally oriented thinking style, and thus pay great attention to external cues in their environment, would attribute events in their lives to be a result of an external influence. Although this relationship remained consistent when predicting both powerful others and chance orientations of external locus of control, alexithymia accounted for more variance while predicting a chance orientation. This is in line with previous research suggesting that while a 'powerful others' orientation is associated with passive coping and hostile feelings, a 'chance' locus of control is been associated with psychopathological problems (Brosschot et al., 1994). Thus, it is fitting that alexithymia, a personality trait associated with psychopathological difficulties such as self-harming behaviours and varied clinical disorders, is a stronger predictor of having a chance orientation than having a powerful others orientation.

Results from the hierarchical regressions suggest that alexithymia is a stronger predictor of self-management skills than emotion regulation. Although this finding was not in line with the theory-based hypotheses, the finding does further support alexithymia's position as reflecting deficits in the cognitive processing of emotions. Self-

management is thought to function as a feedback loop comprised of three facets: self-monitoring, self-evaluation, and self-reinforcement. Self-monitoring (SM) occurs when one pays attention to one's own thoughts and behaviours, and provides an individual with the necessary information to establish realistic goals and evaluate his or her progress towards those goals (Bandura, 1991). It has been thought to be a prerequisite for the following facets in the feedback loop (Rehm et al., 1981). Therefore, individuals with alexithymia who lack the awareness and clarity of their emotions may be unable to adequately self-monitor; ultimately disrupting the subsequent steps in the self-management regulatory system. It is important to note that the difference in predictive value between emotion regulation and alexithymia was minimal, and that emotion regulation was also a significant predictor of self-management. This finding is theoretically consistent with the regulation literature, as the processes underlying emotion regulation are conceptually similar to those of self-management. Both constructs are conceptualized as functioning as recursive systems, whereby each component of the system influences the other components. Both emotion regulation and self-management actively strive to modify or modulate thoughts and behaviours in order to increase well-being. Thus, it is fitting that emotion regulation and self-management would also demonstrate a strong relationship to each other. The strong relationships between all three of these constructs suggests that there is substantial overlap across shared emotional deficits.

Strengths and Limitations

A major strength for this study included the very large sample size. A large sample size is crucial for decreasing the chance of a Type II error and increasing the

power of detecting a significant effect. The large sample increased confidence in assessing relationships between the constructs of interest. However, a possible limitation with the sample lies in the fact that the participants were self-selected into the sample. Furthermore, all of the participants were undergraduate students enrolled in a first or second year psychology course. The generalizability of the results should be further tested in a community sample where the age range is more diverse in order to determine whether these findings are consistent across the lifespan.

All of the measures used in this study demonstrated strong internal consistencies. Multi-faceted measures, as opposed to unidimensional measures, of emotion regulation, alexithymia, and self-management were employed in this study, allowing for an increased understanding of the specific relationships between the various facets of all constructs. A possible limitation to this study included the use of a single measure for each construct. Employing multiple measures while assessing each construct might provide an increased understanding of the relationships between the constructs of interest. Another possible limitation to this study was that all of the measures were self-report. Although a social desirability scale was employed to control for this limitation, future research could use multiple modalities in order to gain a more robust understanding of the unique relationships exhibited between the constructs of interest.

Future Directions

Emotion regulation skills have been found to be comorbid with anxiety and depression. Future research investigating the unique influence of emotion regulation and alexithymia on related constructs might consider controlling for the affective disorders, particularly while assessing these relationships in a clinical population.

This study was designed to examine relationships between the constructs of emotion regulation and alexithymia. While both of these variables are continuous variables, they also have designated levels at which individuals would be considered to be part of a clinical sample. It would be of interest to determine whether the relationships determined in this study would be similarly exhibited in a clinical sample. Future research could examine these relationships within both a clinical and community sample in order to assess whether the proposed relationships are consistent across diverse populations.

In terms of clinical practice, these results suggest that individuals with alexithymia exhibit the greatest deficits in being aware and clear of their feelings. Enhancing emotion regulation skills provides the basis for the majority of third-wave cognitive behavioural therapies (e.g. Dialectical Behaviour Therapy: Linehan, 1998). However, the individual therapies differ in the amount of focus that they allocate to enhancing specific emotion regulation skills. Thus, it is imperative that individuals diagnosed with alexithymia receive optimal treatment that targets their specific emotion regulation deficits. This research suggests that individuals with alexithymia might benefit from a therapy that specifically targets increasing awareness and clarity of one's emotional responses. Mindfulness-based therapies are a recent form of treatment that instructs clients to be aware and clear of their present emotional experience, and accept their emotions in a non-judgemental manner (Williams, Teasdale, Segal, & Kabat-Zinn, 2007). Future research should assess whether individuals diagnosed with clinical levels of alexithymia might benefit from a therapy that directly targets their specific deficits in emotion regulation skills.

This study also suggests several implications for counselling practice, particularly at the university level. During university, students often experience stressors pertaining to novel academic and social demands, resulting in, among other outcomes, increased psychological and emotional distress (Dwyer & Cummings, 2001). As previously stated, the literature suggests that individuals who exhibit difficulties with emotion regulation skills are at an increased risk for engaging in maladaptive behaviours, especially under times of emotional distress (Gross, 1998). Future research could further assess whether the use of emotion regulation skills building groups in university settings could further encourage students to use adaptive behaviours for managing stressful emotions and situations.

Conclusions

This investigation examined the facets of alexithymia and emotion regulation skills in relation to external locus of control and self-management in a non-clinical sample. The results provide important empirical evidence regarding the similarities and differences between the constructs of interest. The lack of precision in distinguishing between the construct of emotion regulation and related constructs that assess emotion regulation skills generates ambiguity in the emotion regulation literature. Thus, it is imperative to have a clear understanding of relationships between related constructs in order to better interpret and inform research and improve treatment for particular clinical populations experiencing difficulties with specific emotion regulation skills.

This investigation demonstrates empirical support for several conclusions, such as 1) emotion regulation and alexithymia are constructs that assess difficulties in emotion regulation skills, (2) alexithymia demonstrates the strongest relationship with the emotion

regulation skills of acceptance and clarity, (3) alexithymia demonstrates a stronger relationship to external locus of control (powerful others and chance) than does emotion regulation due to theoretical similarities between alexithymia and external locus of control of focusing attention on external events and cues for guidance, and (4) alexithymia demonstrates a stronger relationship to self-management compared to emotion regulation.

Overall, this research proposes directions for further clarifying the theoretical foundations of emotion regulation and alexithymia. Specifically, it suggests that emotion regulation and alexithymia can be used to measure difficulties in emotion regulation skills. However, emotion regulation directly assesses the use of cognitive and behavioural emotion regulation skills, while alexithymia more specifically addresses cognitive emotion regulation skills (i.e., the extent to which an individual has an awareness and clarity of their emotions). It should be noted that due to the nature of the current investigation, the results presented should be interpreted with caution until replication of these findings is observed in clinical and community samples.

In sum, this research increases our understanding of the specific relationships between emotion regulation and alexithymia. This research provides insight into clarifying which specific emotion regulation skills are the most strongly associated with alexithymia, and in the process, enhances our understanding of alexithymia's position within the emotion regulation literature.

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Appendix A

Demographic Information Form

Background Information

1. Age:

2. Sex:

   - ☐ Male
   - ☐ Female

3. Ethnic Identity.
   Rank number all that apply (1 for primary ethnicity, 2 secondary, etc.):

   - ☐ Aboriginal (Inuit, Metis, North American Indian)
   - ☐ Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan)
   - ☐ Black (e.g., African, Haitian, Jamaican, Somali)
   - ☐ Chinese
   - ☐ Filipino
   - ☐ Japanese
   - ☐ Korean
   - ☐ Latin American
   - ☐ South Asian
   - ☐ South East Asian
   - ☐ White (Caucasian)
   - ☐ Other *please specify all that apply in order of ethnic identity (most to least)*

4. Religious affiliation:

- ☐ Agnostic/Atheist
- ☐ Buddhist
- ☐ Hindu
- ☐ Jewish
- ☐ Muslim
- ☐ Protestant
- ☐ Roman Catholic
- ☐ Other *please specify* _____

5. Estimated annual family income:

- ☐ $0 - $36,378
- ☐ $36,379 - $72,756
- ☐ $72,757 - 118,285
- ☐ over $118,286

6. Where are you from?

- ☐ City (population of 5.000 or more)
- ☐ Town (population of 500 to 4,999)
- ☐ Village (population of 100 to 499)
- ☐ Farm
- ☐ Other *please specify* _____

7. Year of University:

- ☐ First Year
- ☐ Second Year
- ☐ Third Year
- ☐ Fourth Year
- ☐ Other *please specify* _____

8. Have you declared a major?

- ☐ Yes
- ☐ No

If Yes, what is your major?

_____

Note: if Psychology please indicate if science or arts.

Appendix B

Difficulties in Emotion Regulation Scale (DERS) – Gratz & Roemer, 2004

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

1 Almost never
2 Sometimes
3 About half the time
4 Most of the time
5 Almost always

1.	I am clear about my feelings.	1	2	3	4	5
2.	I pay attention to how I feel.	1	2	3	4	5
3.	I experience my emotions as overwhelming and out of control.	1	2	3	4	5
4.	I have no idea how I am feeling.	1	2	3	4	5
5.	I have difficulty making sense out of my feelings.	1	2	3	4	5
6.	I am attentive to my feelings.	1	2	3	4	5
7.	I know exactly how I am feeling.	1	2	3	4	5
8.	I care about what I am feeling.	1	2	3	4	5
9.	I am confused about how I feel.	1	2	3	4	5
10.	When I'm upset, I acknowledge my emotions.	1	2	3	4	5
11.	When I'm upset, I become angry with myself for feeling that way.	1	2	3	4	5
12.	When I'm upset, I become embarrassed for feeling that way.	1	2	3	4	5
13.	When I'm upset, I have difficulty getting work done.	1	2	3	4	5
14.	When I'm upset, I become out of control.	1	2	3	4	5
15.	When I'm upset, I believe that I will remain that way for a	1	2	3	4	5

	long time.					
16.	When I'm upset, I believe that I'll end up feeling very depressed.	1	2	3	4	5
17.	When I'm upset, I believe that my feelings are valid and important.	1	2	3	4	5
18.	When I'm upset, I have difficulty focusing on other things.	1	2	3	4	5
19.	When I'm upset, I feel out of control.	1	2	3	4	5
20.	When I'm upset, I can still get things done.	1	2	3	4	5
21.	When I'm upset, I feel ashamed with myself for feeling that way.	1	2	3	4	5
22.	When I'm upset, I know that I can find a way to eventually feel better.	1	2	3	4	5
23.	When I'm upset, I feel like I am weak.	1	2	3	4	5
24.	When I'm upset, I feel like I can remain in control of my behaviors.	1	2	3	4	5
25.	When I'm upset, I feel guilty for feeling that way.	1	2	3	4	5
26.	When I'm upset, I have difficulty concentrating.	1	2	3	4	5
27.	When I'm upset, I have difficulty controlling my behaviors.	1	2	3	4	5
28.	When I'm upset, I believe there is nothing I can do to make myself feel better.	1	2	3	4	5
29.	When I'm upset, I become irritated with myself for feeling that way.	1	2	3	4	5
30.	When I'm upset, I start to feel very bad about myself.	1	2	3	4	5
31.	When I'm upset, I believe that wallowing in it is all I can do.	1	2	3	4	5
32.	When I'm upset, I lose control over my behaviors.	1	2	3	4	5

33.	When I'm upset, I have difficulty thinking about anything else.	1	2	3	4	5
34.	When I'm upset, I take time to figure out what I'm really feeling.	1	2	3	4	5
35.	When I'm upset, it takes me a long time to feel better.	1	2	3	4	5
36.	When I'm upset, my emotions feel overwhelming.	1	2	3	4	5

Appendix C

The 20-item Toronto Alexithymia Scale (TAS-20) – Bagby, Taylor, & Parker, 1994.

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

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

1.	I am often confused about what emotion I am feeling.	1	2	3	4	5
2.	It is difficult for me to find the right words for my feelings.	1	2	3	4	5
3.	I have physical sensations that even doctors don't understand.	1	2	3	4	5
4.	I am able to describe my feelings easily.	1	2	3	4	5
5.	I prefer to analyze problems rather than just describe them.	1	2	3	4	5
6.	When I am upset, I don't know if I am sad, frightened, or angry.	1	2	3	4	5
7.	I am often puzzled by sensations in my body.	1	2	3	4	5
8.	I prefer to just let things happen rather than to understand why they turned out that way.	1	2	3	4	5
9.	I have feelings that I can't quite identify.	1	2	3	4	5
10.	Being in touch with emotions is essential.	1	2	3	4	5
11.	I find it hard to describe how I feel about people.	1	2	3	4	5
12.	People tell me to describe my feelings more.	1	2	3	4	5
13.	I don't know what's going on inside me.	1	2	3	4	5
14.	I often don't know why I am angry.	1	2	3	4	5

15.	I prefer talking to people about their daily activities than their feelings.	1	2	3	4	5
16.	I prefer to watch "light" entertainment shows rather than psychological dramas.	1	2	3	4	5
17.	It is difficult for me to reveal my innermost feelings even to close friends.	1	2	3	4	5
18.	I can feel close to someone, even in moments of silence.	1	2	3	4	5
19.	I find examination of my feelings useful in solving personal problems.	1	2	3	4	5
20.	Looking for hidden meanings in movies or plays distracts from their enjoyment.	1	2	3	4	5

Appendix D

The Self-Control and Self-Management Scale (SCMS) – Mezo, 2007

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

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

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

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

Appendix E

Internality, Powerful Others, and Chance Scales (IPC) – Levenson, 1973.

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

-3 Strongly Disagree
-2 Disagree
-1 Slightly Disagree
+1 Slightly Agree
+2 Agree
+3 Strongly Agree

1.	Whether or not I get to be a leader depends mostly on my ability.	-3	-2	-1	+1	+2	+3
2.	To a great extent my life is controlled by accidental happenings.	-3	-2	-1	+1	+2	+3
3.	I feel like what happens in my life is mostly determined by powerful people.	-3	-2	-1	+1	+2	+3
4.	Whether or not I get into a car accident depends mostly on how good a driver I am.	-3	-2	-1	+1	+2	+3
5.	When I make plans, I am almost certain to make them work.	-3	-2	-1	+1	+2	+3
6.	Often there is no chance of protecting my personal interests from bad luck happenings.	-3	-2	-1	+1	+2	+3
7.	When I get what I want, it's usually because I'm lucky.	-3	-2	-1	+1	+2	+3
8.	Although I might have good ability, I will not be given leadership responsibility without appealing to those in positions of power.	-3	-2	-1	+1	+2	+3
9.	How many friends I have depends on how nice a person I am.	-3	-2	-1	+1	+2	+3
10.	I have often found that what is going to happen will happen.	-3	-2	-1	+1	+2	+3

11.	My life is chiefly controlled by powerful others.	-3	-2	-1	+1	+2	+3
12.	Whether or not I get into a car accident is mostly a matter of luck.	-3	-2	-1	+1	+2	+3
13.	People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.	-3	-2	-1	+1	+2	+3
14.	It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.	-3	-2	-1	+1	+2	+3
15.	Getting what I want requires pleasing those people above me.	-3	-2	-1	+1	+2	+3
16.	Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.	-3	-2	-1	+1	+2	+3
17.	If important people were to decide they didn't like me, I probably wouldn't make many friends.	-3	-2	-1	+1	+2	+3
18.	I can pretty much determine what will happen in my life.	-3	-2	-1	+1	+2	+3
19.	I am usually able to protect my personal interests.	-3	-2	-1	+1	+2	+3
20.	Whether or not I get into a car accident depends mostly on the other driver.	-3	-2	-1	+1	+2	+3
21.	When I get what I want, it's usually because I worked hard for it.	-3	-2	-1	+1	+2	+3
22.	In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.	-3	-2	-1	+1	+2	+3
23.	My life is determined by my own actions.	-3	-2	-1	+1	+2	+3
24.	It's chiefly a matter of fate whether or not I	-3	-2	-1	+1	+2	+3

have a few friends or many friends.

Appendix F

The Marlowe-Crowne Social Desirability Scale (MCSD) – Crowne & Marlowe, 1960

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true* or *false* as it pertains to you personally.

		False	**True**
1.	Before voting I thoroughly investigate the qualifications of all the candidates.	0	1
2.	I never hesitate to go out of my way to help someone in trouble.	0	1
3.	It is sometimes hard for me to go on with my work if I am not encouraged.	0	1
4.	I have never intensely disliked anyone.	0	1
5.	On occasion I have had doubts about my ability to succeed in life.	0	1
6.	I sometimes feel resentful when I don't get my way.	0	1
7.	I am always careful about my manner of dress.	0	1
8.	My table manners at home are as good as when I eat out in a restaurant.	0	1
9.	If I could get into a movie without paying and be sure I was not seen I would probably do it.	0	1
10.	On a few occasions, I have given up doing something because I thought too little of my ability.	0	1
11.	I like to gossip at times.	0	1
12.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	0	1
13.	No matter who I'm talking to, I'm always a good listener.	0	1
14.	I can remember "playing sick" to get out of something.	0	1

15.	There have been occasions when I took advantage of someone.	0	1
16.	I'm always willing to admit it when I make a mistake.	0	1
17.	I always try to practice what I preach.	0	1
18.	I don't find it particularly difficult to get along with loud mouthed, obnoxious people.	0	1
19.	I sometimes try to get even rather than forgive and forget	0	1
20.	When I don't know something I don't at all mind admitting it.	0	1
21.	I am always courteous, even to people who are disagreeable.	0	1
22.	At times I have really insisted on having things my own way.	0	1
23.	There have been occasions when I felt like smashing things.	0	1
24.	I would never think of letting someone else be punished for my wrong-doings.	0	1
25.	I never resent being asked to return a favor.	0	1
26.	I have never been irked when people expressed ideas very different from my own.	0	1
27.	I never make a long trip without checking the safety of my car.	0	1
28.	There have been times when I was quite jealous of the good fortune of others.	0	1
29.	I have almost never felt the urge to tell someone off.	0	1
30.	I am sometimes irritated by people who ask favors of me.	0	1
31.	I have never felt that I was punished without a cause.	0	1
32.	I sometimes think when people have a misfortune they only got what they deserved.	0	1

33.	I have never deliberately said something that hurt someone's feelings.	0	1

Appendix G

Undergraduate Initial Contact Script

Hello everyone. My name is Kerri Bojman and I am working on research under the supervision of Dr. Peter Mezo of the psychology department. We are currently conducting a study on emotions in undergraduate students. We are looking for volunteers to complete some short self-report measures pertaining to how you think about feelings and emotions.

If you are interested in being a participant in this study, please print your full name and Memorial University e-mail address on the piece of paper that will be distributed. You will be contacted via e-mail with a URL link to access the online measures. The measures will take approximately 30 minutes to complete.

The entire study is confidential. Your name will not appear on any of the questionnaire packages nor in any written documents pertaining to the study. Your participation in this study is entirely voluntary. You will receive no penalty for not participating. If you do complete the study, you will receive a two percent bonus towards your midterm mark for this course.

Thank you very much for your time.

Appendix H

Informed Consent Form

Title: Emotion regulation in undergraduate students **Researchers**: Kerri Bojman (709-864-8876, kmb536@mun.ca) and Dr. Peter Mezo (709-864-4345; mezo@mun.ca).

You are invited to take part in a research project entitled *Emotion regulation in undergraduate students.* This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any other information given to you by the researcher.

It is entirely up to you to decide whether to take part in this research. If you choose not to takea part in the research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

Introduction: Being able to regulate one's emotions is crucial for optimal functioning. However, precise definitions between emotion regulation, and other constructs that indirectly assess emotion regulation, are unclear. One such related construct is alexithymia, a personality trait representing several emotional deficits that are thought to impede with proper emotion regulation (Taylor, 1994; Luminet et al, 2004). Both emotion regulation and alexithymia are frequently used in research; however, their specific relationship has yet to be fully examined. We aim to compare and contrast emotion regulation and alexithymia, and relate these findings to other related psychological variables, in order to increase our understanding of how specific emotional deficits impede with one's ability to regulate his/her emotions.

Purpose of study: The purpose of the present research is to examine the unique relationships between emotion regulation and alexithymia, and to assess the relative contributions of alexithymia and emotion regulation in predicting theoretical constructs (in particular, self-management and external locus of control) that are related to both emotion regulation and alexithymia, but to different degrees.

What you will do in this study: You have just received the URL link in your mailbox that redirected you to this website and consent form. After giving your consent at the end of this page, you will complete an online battery of one short demographic form and five questionnaires.

Length of time: The online battery should take you between 30 and 40 minutes to complete.

Possible Benefits: There are no direct benefits that might accrue directly to your participation in this study. However, you might gain a greater understanding of your thoughts and feelings regarding your emotions.

Possible risks: There are minimal foreseeable risks to participating in this study. In the unlikely event that you become uncomfortable during the study, you are free to terminate your participation at any point, and suffer no consequences whatsoever for doing so. If you experience distress upon completing this study, you are encouraged to contact the University Counselling Center (709-864-8874). In the event of extreme distress, please call the Health and Community Services Crisis line at 1-888-737-4668 where a counsellor will be available to speak with you immediately.

Confidentiality: The sign-up recruitment sheets will be stored in a locked filing cabinet. The website with the online battery will only be accessible by the investigator and the supervisor of the investigator through the use of a designated password.

Anonymity: Throughout this study, every reasonable effort will be made to assure your anonymity. A database containing only e-mail addresses and no other form of identifying information was created in order to ensure anonymity throughout the research process. All online forms will be coded with only your study code. There will be no link between your name and your online questionnaire data. You will not be identified in any report or publication related to this study without your explicit permission.

Reporting of Results: The data collected will be used for the primary investigator's masters thesis, and subsequent related journal articles and conference presentations. However, the principal investigator or her supervisor may analyze the data beyond the scope of this thesis. The data will be reported in aggregated and summarized form, without any personally identifying information.

Storage of Data: The data will be stored in a secure online database. Only the primary investigator and her supervisor will have access to this data through the use of a password. The data will be retained for a minimum period of five years. When the data is no longer required for research purposes, the online database will be appropriately deleted.

Questions: You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please feel free to contact the primary investigator, Kerri Bojman, by phone (709-864-8876) or e-mail (kmb536@mun.ca). You can also contact her supervisor, Dr. Peter Mezo, by phone (709-864-4345) or by e-mail (mezo@mun.ca).

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have

been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 864-2861.

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