

Doctoral thesis: Does resilience mediate the relationship  
between emotion dysregulation and GAD?

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Doctoral Thesis

Does Resilience Mediate the Relationship between  
Emotion Dysregulation and Generalised Anxiety Disorder?

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### **Abstract**

The relationship between emotion dysregulation and Generalised Anxiety Disorder (GAD) has been demonstrated in research for the past ten years, with the positing of the Emotion Dysregulation Model of GAD (Mennin et al., 2005). The role of resilience in buffering against mood disorders has also been investigated and resilience training has been successfully utilised as an adjunct to therapy for GAD (Fava et al., 2004). This research considers whether resilience mediates between emotion dysregulation and GAD. One hundred and eighty seven participants were recruited from online social media platforms and self-help forums and completed online questionnaires. These questionnaires included a measure of resilience, two measures of emotion regulation, a measure of worry, a measure of GAD symptoms, a depression measure and brief demographic questions. Participants were split into high and low GAD symptoms groups dependent on their score on the Generalised Anxiety Disorder-7 item questionnaire using a cut-off of 10 (Spitzer, Kroenke, William & Lowe, 2006).

The results showed that participants in the high GAD symptoms group had significantly higher emotion dysregulation scores, lower resilience scores and were less likely to engage in adaptive emotion regulation strategies. Emotion dysregulation was also found to be a significant predictor of GAD symptoms. Resilience was not found to be a mediator between emotion dysregulation and GAD, however the relationship between emotion dysregulation and worry was partially mediated by resilience. This highlights potentially different mechanisms behind the pervasive worry experienced by those with GAD and GAD symptoms in general. This has important implications for future research and clinical interventions for GAD.

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## CHAPTER ONE

### 1. Introduction

#### 1.1 Overview of the Chapter

The current research examines resilience as a mediator between emotion dysregulation and Generalised Anxiety Disorder (GAD). This chapter introduces the key concepts and background of the study. The proposed mediation model examining the role of resilience is under-researched, and therefore this chapter critically appraises the literature related to each of the key concepts of the proposed theoretical model.

The first section of the introduction examines GAD, its prevalence and impact on both individuals and society as a whole. Theoretical models of GAD are also outlined. The second section of the introduction focuses on emotion dysregulation and reviews the evidence for an emotion dysregulation model of GAD (Mennin, Heimberg, Turk & Fresco, 2005). The third section summarises current conceptualisations of resilience and reviews the evidence for resilience being a protective factor within mental health. The next section considers two models of resilience, namely the Broaden-and-Build theory (Fredrickson, 1998; 2001) and a framework for resilience (Troy & Mauss, 2011), and critically appraises evidence for a relationship between resilience and emotion regulation. The chapter concludes by considering the reliability and validity of Internet Mediated Research (IMR), as utilised within the current study, and presents the aims and hypotheses of the research.

## **1.2 Generalised Anxiety Disorder (GAD)**

### **1.2.1 What is Generalised Anxiety Disorder?**

Generalised Anxiety Disorder (GAD) is characterised by excessive and persistent worry that is without specificity and often with a shifting focus (Aikins & Craske, 2001). Worry is a hallmark feature of GAD and as such, there are suggestions that Generalised Anxiety Disorder might be better and more accurately termed as Generalised Worry Disorder in the DSM-5 (Andrews et al., 2010). The DSM-5 was launched in May 2013 and has largely had a mixed response in the US and in the UK (Nemeroff et al., 2013; Wakefield, 2013). Amongst the changes, the diagnostic threshold for GAD has been lowered, with only one symptom of four required to necessitate a diagnosis, compared to three of six symptoms required in the DSM-IV. In addition, symptoms only have to have been present for one month compared to six months in the DSM-IV. Reduction of threshold criteria for GAD in the DSM-5, reduce the specificity of GAD diagnosis with the concern that individuals experiencing normative levels of worries may be erroneously classified (Frances, 2012). Although the DSM-5 is the current diagnostic classification, the current research study uses measures that classify GAD in line with the DSM-IV (American Psychiatric Association, 2000) such as the GAD-7 (Spitzer, Kroenke, Williams & Löwe, 2006). Given that the DSM-5 is relatively recent, at the time this research was conducted, measures had not yet been created in line with the revised diagnostic criteria.

GAD is the most commonly seen anxiety disorder in primary care and has the highest lifetime prevalence of the anxiety disorders (Somers et al., 2006). GAD is often found to be co-morbid with other physical disorders such as diabetes and

irritable bowel syndrome, as well as with other somatic symptoms without an identifiable organic cause. As such, the primary reason that patients visit their GP can often be for somatic symptoms (Ballenger et al., 2001) such as muscle tension, sleep difficulties or irritability, and therefore the diagnosis of GAD has added complexities (Löwe, Spitzer, Williams, Mussell, Schellberg & Kroenke, 2008).

In addition, those with GAD can often have comorbid Major Depressive Disorder (MDD; Hofmann, Schulz, Heering, Muench & Bufka, 2010; Kessler, Gruber, Hettema, Hwang, Sampson & Yonkers, 2008), leading to early suggestions that GAD and MDD should be classified as a single diagnostic disorder (Grant et al., 2005). Within the DSM-IV-TR, diagnostic criteria for the two disorders overlap in symptoms such as fatigue, restlessness and sleeping problems (Hendriks et al., 2014). The Cognitive Content-Specificity model (CCS; Beck, 1976) and Tripartite model (Clark & Watson, 1991) have been used to explain differences between MDD and GAD. The CCS model postulates differences in thought content as being integral in the differentiation between MDD and GAD, with depressive thought being past focused and consisting of negative evaluations of the self, the world and the future, in comparison to anxious thought which is future focused and dominated by beliefs of an inability to cope.

This has found support in research (e.g. Borkovec, Ray & Stober, 1998) which has shown that individuals with GAD utilise worrying as a thought strategy in an attempt to problem-solve by anticipating future problems in the effort of preventing or minimizing them. Whilst this is not a successful strategy, the attempt to do so means that the content of the worry is typically future focused. Conversely, rumination, which is a typical component of MDD, focuses on past events and their consequences without engaging any form of problem solving (Nolen-Hoeksema,

2000). Segerstrom et al. (2000) suggests that this difference is due to difference in goal orientation, with worry representing 'unresolved safety goals' and rumination involving 'unresolved self-identity and understanding' goals.

The tripartite model (Clark & Watson, 1991) however, proposes negative affect is associated with both disorders, but that each disorder contains a general component, a specific component and a unique component (Mineka, Watson & Clark, 1998), with depression being associated with low positive affect, and anxiety being associated with high physiological hyperarousal (Anderson & Hope, 2008). Previous research has shown that the combination of the tripartite model and the CCS model are correlated and best combined to effectively discriminate between MDD and GAD (Beck, Benedict & Winkler, 2003).

Hendriks et al. (2014) investigated differences in cognitive profiles between GAD and MDD, particularly in relation to cognitive reactivity to sad mood, anxiety sensitivity and pathological worry. Data for the research was collected from the Netherlands Study of Depression and Anxiety (NESDA) and included data from 1028 participants. Participants were included if they had six-month GAD and/or MDD diagnoses, determined using the Composite Interview Diagnostic Instrument (CIDI version 2.1) (Wittchen, 1994). Cognitive profiles were examined using the Leiden Index of Depression Sensitivity (LEIDS-R), the Anxiety Sensitivity Index (ASI) and the Penn State Worry Questionnaire (PSWQ).

The results demonstrated differences in cognitive profiles between the groups, with individuals with MDD reporting significantly more hopelessness/suicidality and rumination, than those with GAD. Physical concerns were significantly higher in GAD compared to MDD, as was pathological worry, however the comorbid



MDD/GAD group demonstrated the highest levels of pathological worry. Logistic regression analyses were conducted and demonstrated that for MDD, hopelessness/suicidality and rumination were characteristic of MDD, and pathological worry and physical concerns were characteristic of GAD. Pathological worry distinguishes MDD/GAD from MDD, and higher physical concerns distinguished GAD from MDD/GAD.

The research utilizes a large sample and as such, is well-powered. Both ASI and PSWQ have good internal reliability and are well-established self-report measures however, the LEIDS-R whilst generally having good internal reliability, did not display this for all subscales. However, the results suggest cognitive profiles that distinguish and determine diagnosis and are compatible with models such as the CCS model and tripartite model.

### **1.2.2 The Prevalence of Generalised Anxiety Disorder**

Using data from 9282 participants who completed the National Comorbidity Survey Replication, Kessler et al. (2005) found a lifetime prevalence of GAD of approximately 5.7% and suggests that 22% of those who present to primary care with an anxiety disorder, present with GAD symptomology. The highest rates of GAD are found in participants aged in their 40's and 50's (Wittchen et al., 2002), however typically participants have experienced symptoms for between five and ten years before they are diagnosed and treated (Kessler et al., 2001) with some research suggesting symptoms may be present for up to twenty years (Keller, 2002). This suggests the onset of GAD symptoms may occur a lot earlier than the time of diagnosis would imply, and that GAD is not a condition that spontaneously remits. Research by Campbell, Brown and Grisham (2003) found that the mean age for

onset in their sample of 154 participants with GAD, was around 18 years of age, with 25 reporting that the onset of GAD occurred age 10 years or younger, with peaks at between 5 and 8 years old, and later between 16 and 19 years old. People who reported later GAD onset, beginning in adulthood, were more able to identify a stressor or stressful life event that accompanied this onset.

Gender differences have been observed in GAD (Kessler et al., 1994) however there have been limitations in these studies, typically due to small sample sizes and reliance on treatment-seeking samples. Research by Vesga-López et al. (2008) using the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) assessed gender differences in epidemiology, comorbidity and treatment-seeking of individuals with GAD using a number of self-report questions and measures. The results showed a lifetime prevalence rate of 5.3% for women and 2.8% for men, the former reflecting a similar prevalence to Kessler et al. (2005). The mean age for onset of GAD was equivocal in men and women at 32 years old, differing somewhat from previous estimates of 18 years (Campbell et al., 2003). The course of GAD was shown to be the same in men and women, however the symptoms displayed tended to vary between the sexes, with women more likely to endorse a higher number of DSM criteria. The results also found that the age at which men and women first seek treatment was around 34-35 years, however men were significantly less likely than women to seek outpatient treatment or use medication.

This research represents data from a large epidemiological study and is reflective of the general population. Similar prevalence rates and gender differences have also been found in other epidemiological studies (McLean, Asnaani, Litz & Hofmann, 2011). Interestingly, in keeping with the research by Kessler et al. (2001), the data indicated that there was a lack of treatment for individuals with GAD, with

fewer than half of the participants, seeking treatment. The research relied on self-report and may have included details from the past that may not have been easily recalled. Despite this, this research provides useful information on the prevalence of GAD that has since been replicated.

Generally, studies considering the prevalence of GAD have focused on individuals with diagnosed GAD, however there appears a high prevalence of GAD symptoms, such as persistent worry, found in general population surveys (Kessler, Walters & Wittchen, 2004). Given this, GAD prevalence rates reliant on clinical populations or formal diagnosis are likely to underestimate the true number. Additionally, Kessler et al. (2004) purport that if data from studies investigating anxiety as a personality trait were also included then the prevalence of clinically significant levels of GAD may be as high as 8% in the general population. This is significantly higher than was previously thought given epidemiological studies determining GAD using purely DSM criteria.

### **1.2.3 The Impact of GAD**

Previously GAD was thought to be associated with a low level of disability, however in light of the chronic nature of GAD, the implications not only on the individual, but also on society, have been investigated and are better understood as involving a high level of impairment (Allgulander, 2006). Henning, Turk, Mennin, Fresco and Heimberg (2007) conducted research using 52 treatment seeking individuals with GAD, 33 of whom had a comorbid Axis I diagnosis, and 55 non anxious controls. Participants completed self-report measures of impairment, quality of life (QoL) and symptoms (worry and depression symptoms).

The results in the clinical sample found that QoL was significantly inversely correlated with current disability, as well as impairment at work, at home and in social life. The results also found that individuals with GAD and another comorbid diagnosis, rated their social impairment as greater than those with pure GAD, however there was no significant difference for other types of impairment (Henning et al., 2007). In comparison to controls, individuals with GAD reported being less satisfied with their QoL. The results demonstrate the detrimental impact GAD has on an individual to their ability to function on a day-to-day basis, and on their interpersonal relationships. The research relies on self-report measures and therefore may be subject to bias, particularly as participants took the questionnaires home rather than completing them in a controlled environment, however as a result they may have been less subject to experimenter bias.

Research by Toghanian, DiBonaventura, Jarbrink and Locklear (2014) using patient survey data from 2008, studied the economic burden of GAD in France, Germany, Italy, Spain and the UK. The research quantified the economic cost of GAD using cost-analyses both directly, through the reported use of health care resources, and also indirectly using the costs associated with reduced work productivity or sick days. Participants with self-reported GAD diagnoses were matched with non-GAD participants based on country of origin, age, sex and employment status. They considered health related quality of life (HRQoL), work productivity, health care resource utilization and cost burden. The results found that HRQoL was poorer in those with GAD than their matched controls and as GAD severity increased, there was a significant decrease in HRQoL. In terms of work productivity in Europe overall, those with GAD had greater absenteeism (59% higher mean value compared to patients without GAD), greater overall work

impairment (38% higher mean value) and increased activity impairment (16% higher mean value). There were some differences by country, with absenteeism similar in Germany for both those with GAD and those without. In the UK, levels of work and activity impairment were similar in both groups.

Differences were also found when comparing mild GAD with moderate and severe GAD. Levels of absenteeism were only significant when comparing moderate/severe GAD participants to non-GAD participants. Healthcare resources were typically more utilised by those with GAD (71% higher mean value), however there were no differences in A&E visits or hospitalizations. Finally, across all five countries, direct costs for health care utilization were on average 659 euros (approximately £516) higher per patient, per year for those with GAD versus those without GAD. Similarly, indirect costs were estimated to be 2208 euros (approximately £1730) higher per person, per year for those with GAD.

These figures demonstrate the severity of GAD economically. The study is limited by its reliance on participant self-report. Gathering information such as hospital records or work records to determine actual health care use and work absenteeism would have increased the reliability of the study. This research studies participants from five major countries in Europe and presents the results collectively, whilst also acknowledging differences between countries. Further detailed study of the differences between countries would be useful in elucidating some of the reasons behind the differences. For example, in general, the higher the severity of GAD, the higher the associated costs, however, people with severe GAD in Germany had lower overall costs (9900 euros) compared to those with moderate GAD (13,546 euros). This may be associated with Psychologist/Psychiatrist access for those with severe GAD compared to those with mild/moderate GAD, or may

represent some other difference specific to Germany. Future research is needed to determine these subtle differences.

## **1.2.4 Psychological interventions for GAD symptoms**

### **1.2.4.1 Cognitive Behavioural Therapy for GAD symptoms**

Given that GAD is a pervasive condition with a high level of impairment, and with relapse rates of over 50% (Holaway, Rodebaugh and Heimberg, 2006), receiving effective interventions is of paramount importance. In addition, GAD is proposed to be one of the most difficult anxiety disorders to treat (Gould, Safren, O'Neill Washington et al., 2004). The National Institute for Health and Clinical Excellence (NICE) however published clinical guidelines for GAD (NICE, 2011) and recommend a stepped approach to intervention. The psychological intervention primarily suggested within the guidelines is Cognitive Behavioural Therapy (CBT), either used in a low intensity format (i.e. computerized self-help or in a group setting) or in a high intensity format (i.e. individual therapy).

To date, research investigating the efficacy of CBT for GAD has shown that it can be beneficial, however there have been considerable variability in outcomes found between research studies (Hoffman, Asnaani, Vonk, Sawyer & Fang, 2012), and whilst CBT has been shown to effect clinically significant change, this is not always to a greater extent than other interventions, such as relaxation (Siev & Chambless, 2007). Furthermore, research investigating the long term benefits of the interventions have not produced conclusive results.

Hanrahan, Field, Jones and Davey (2013) conducted a meta-analysis looking at the efficacy of Cognitive Therapy (CT) for worry symptoms in GAD. Studies

were eligible for inclusion if they included participants with a GAD diagnosis, and if they used the PSWQ as an outcome measure. This resulted in the inclusion of 17 studies, which were split dependent on the type of control group used. The results showed that compared to participants on a waiting list with no active intervention, CT had better outcomes with positive and large effect sizes favouring CT. When examining the outcomes of studies that used a non-CT intervention, such as relaxation, there were medium effect sizes favouring CT. Some of the research compared CT to other therapies, and Hanrahan et al. (2013) found a small effect favouring CT. The analysis by Hanrahan et al. (2013) suggests that CT is an effective intervention particularly when compared to no active intervention, however the effect sizes reduce when CT is compared with other interventions. Given that the research is looking particularly at worry symptoms, less is known about the reduction in other GAD symptoms as a result of CT.

The Wells (2005) model suggests that treatments for GAD needs to focus on the maintenance processes behind the generalised anxiety, rather than just target the symptoms, otherwise the treatment is less likely to have long term efficacy. In general, CBT is focused on reducing the symptoms associated with a mental health condition however, in GAD this does not work with the same efficacy and there is a reduced likelihood of long term positive outcomes. In particular, the focus of CBT on challenging the content of the worry within GAD is often met with the replacement of one worry for another. Therefore, it is suggested that treatment should focus on the metacognitions and the control they have over regulation strategies instead (Wells, 2007).

Hunot, Churchill, Teixeira and Silva de Lima (2010) conducted a Cochrane review on psychological therapies for Generalised Anxiety Disorder, including

randomised and quasi-randomised controlled trials of adults with a primary diagnosis of GAD. Twenty-five studies were included in the review, with 13 studies comparing CBT to a control group, waiting list or treatment as usual (TAU) and 12 studies comparing CBT to another psychological therapy. The results demonstrated that CBT was more effective in reducing anxiety symptoms than waiting list or TAU conditions however, long term benefits could not be determined due to constraints of the reviewed research. The results are less conclusive with regard to a comparison between CBT and other therapies, due to differing results between studies, and limited studies comparing CBT to some modes of therapy, such as psychodynamic therapy. This represents a good quality review, with clear selection criteria, that allow a number of comparisons to be made however, is limited by a lack of research in the area, particularly in terms of comparisons between therapies.

Cuijpers et al. (2014) conducted a further meta-analysis investigating the psychological treatment of GAD. Research studies were included only if participants met diagnostic criteria through a formal interview, and the studies were assessed with four criteria of the 'Risk of bias' assessment tool (Higgins & Green, 2008) ensuring the quality of the research included in the review. The results demonstrated that CBT was superior in reducing symptoms of worry, anxiety and depression, compared to wait list controls. There was no significant difference between CBT and applied relaxation, however at 12 month follow up, CBT had a significantly better outcome. Given the difference between therapies at the later follow-up that was not immediately apparent, this highlights the importance of follow up data in gaining an accurate reflection of treatment efficacy. Interestingly a smaller effect size was found when symptom change was based on self-report measures compared to clinician ratings highlighting the differences that can occur dependent on the method



used, and that there is an important difference between statistically and clinically significant change (van der Heiden, Muris & van der Molen, 2012).

Whilst research has shown that Cognitive Behavioural Therapy (CBT) is efficacious in the treatment of GAD symptoms (e.g. Hanrahan et al., 2013), results of literature reviews and meta-analyses indicate that it may not be as efficacious as it is with other anxiety disorders (Hofmann & Smits, 2008) and it does not show clear benefits in comparison to other psychological therapies (Hunot et al., 2010). This research demonstrates that there remains uncertainty about the most appropriate and effective method of treatment for GAD symptoms.

#### **1.2.4.2 Well-Being Therapy (WBT) for GAD symptoms.**

Given the uncertainty regarding the effective treatment of GAD symptoms using CBT, and the focus of CBT on distress, the use of Well-Being Therapy (WBT; Fava, 1999) has been proposed. Well-being therapy was created due to a number of concerns that traditional psychological therapy was designed only to reduce distress, and there was a need to also consider improving a person's well-being and resilience. For example, Fava, Ruini and Belaise (2007) found that after therapy for mood and anxiety disorders, a number of residual symptoms can remain, and patients can also suffer a relapse (Fava, Tomba & Grandi, 2007). In addition, individuals who were in remission with mood and anxiety disorders tended to have lower levels of psychological well-being when compared to healthy controls (Rafanelli et al., 2000).

WBT was developed by Fava (1999) based on the six dimensions of psychological well-being proposed by Ryff (1989): autonomy, environmental mastery, purpose in life, positive relations and self-acceptance. WBT is a short term

therapy of eight sessions, lasting up to 50 minutes, and is directive and problem-oriented (Ruini & Fava, 2009). The initial sessions require the person to focus on episodes of well-being, reporting the circumstances and situational context in which they occurred. Once these have been determined, the intermediate sessions look at when the person's thoughts and beliefs interrupted this well-being, sharing similarities with both Cognitive Therapy and Rational-Emotive Therapy, but with the focus remaining on well-being rather than distress. Activities and situations that encourage a sense of well-being are reinforced and assigned as home tasks. The final sessions are focused on specific impairments in the six well-being characteristics outlined by Ryff (1989). The aim in these sessions is for the therapist to help guide the patient into a more optimal level of well-being, and therefore not only to see a reduction in distress, but also an improvement in well-being.

Fava et al. (2004) randomly assigned 20 patients diagnosed with GAD to either eight sessions of CBT or four sessions of CBT followed by four sessions of WBT. The researchers found a significant reduction in anxiety in both groups, however patients in the combined CBT and WBT group were observed to have significantly greater improvements in symptoms and improved psychological well-being. It is suggested that the greater improvement in therapeutic outcome as a result of the additional WBT sessions (i.e. reduced anxiety and improved well-being), may result from one of the techniques using self-monitoring of episodes of well-being (Fava & Tomba, 2009). This shares similarities with the self-monitoring tasks used within traditional CBT interventions, however the authors suggest that WBT also gets participants to focus on positive episodes of well-being rather than solely focusing on distress. The authors propose that individuals may be better able to comprehensively identify automatic thoughts when considering positive experience

compared to when monitoring episodes of distress. The original suggested length of WBT however is 8 sessions (Fava, 1999; Fava & Ruini, 2009) and Fava et al. (2004) only used 4 sessions. The research also condensed the suggested 12-15 CBT sessions for GAD (NICE guidelines) to 4 or 8 sessions which may have reduced its effectiveness, particularly in the CBT only group.

This advance in therapy is relatively new and as such, there is limited literature looking at the efficacy of WBT for GAD symptoms, with the majority of research conducted by Fava and colleagues who have a vested interest in demonstrating the efficacy of WBT. The research conducted using WBT for people with mood disorders is promising (e.g. Moeenizadeh & Salgame, 2010), and its use as an adjunct to CBT may incorporate the best of both, providing a means of not only reducing distress but also improving well-being and resilience. However, more research is needed to determine if it has the same benefits with individuals diagnosed with GAD. In addition, greater understanding is needed of the specific components underlying GAD, particularly given the importance of focusing on factors involved in maintaining GAD, rather than just the symptoms (Wells, 2005; Wells, 2007).

### **1.2.5 Overview of the models of GAD**

An empirical understanding of GAD and its development remains in its infancy (Vasey & Dadds, 2001), with research tending to focus on the maintaining mechanisms of GAD rather than its etiology. Research has shown that individuals with GAD tend to report a lifetime of anxiety, suggesting the possibility of an innate, genetic based component (Vasey & Dadds, 2001). Studies using twin subjects have indicated a moderate genetic involvement of GAD (Kendler et al.,

1995). Andrews (1996) however argues that it is a general vulnerability to anxiety that is inherited, rather than to specific mood disorders. In addition, research has shown that early reinforcement of anxious avoidance can increase and maintain anxiety (Dadds, Barrett, Rapee & Ryan, 1996), as well as anxious responses being acquired through modelling. Mineka and Zinbarg (2006) suggest that those with higher trait anxiety may be particularly prone to uncontrollable and unpredictable aversive events. More specifically for GAD however, it is suggested that individuals who develop GAD have less tolerance for uncertainty (Dugas, Buhr & Ladouceur, 2004) and therefore find it particularly difficult not to be able to know what the future holds. Given that the theories of GAD outlined below do not focus on the development of GAD but on maintaining factors, only the content specific to each of the models will be discussed within this section.

Three of the main theories of GAD are discussed below, including the Intolerance of Uncertainty model (Dugas, Letarte, Rheaume, Freeston & Ladouceur, 1995), the Metacognitive model of GAD (Wells, 1995, 2005), and the Emotion Dysregulation model (Mennin, Heimberg, Turk & Fresco, 2002; Mennin, Turk, Heimberg & Carmin, 2004). The Emotion Dysregulation model (Mennin et al., 2002; 2004) will be addressed in more detail in the next section given its pertinence to the current research. Other models of GAD do exist, such as the Acceptance-Based Model (ABM) of GAD (Roemer & Orsillo, 2002; 2005) however this was not included given that it is in its infancy and the detail discussed in the paper by Behar et al. (2009) is based on personal communication with the authors. In addition, it bears similarities to parts of the emotion dysregulation model (Mennin et al., 2005). In addition, the Avoidance Model of Worry (AMW; Borkovec, 1994) draws from the emotional processing model (Foa & Kozak, 1986), which conceptualises worry

as a verbal linguistic thought-based activity, used to counter the mental imagery and associated somatic & emotional activation. By avoiding the emotional and somatic process of fear through worrying, the emotional processing of fear is not completed, and thus there is not the associated habituation and extinction of that fear.

Whilst both the ABM and AMW models provide some explanation of GAD and its maintaining factors, the three models primarily considered within this section were chosen as they represent distinct ways of conceptualising GAD and provide a comprehensive coverage of GAD and intervention strategies.

#### **1.2.5.1 Intolerance of Uncertainty (IU) Model**

Dugas, Gagnon, Ladouceur and Freeston (1998) propose a conceptual model of GAD involving intolerance of uncertainty, poor problem orientation, beliefs about worry and cognitive avoidance as its main components. Figure 1 shows a pictorial representation of the Intolerance of Uncertainty (IU) model and how these components fit together within GAD. The authors propose that intolerance of uncertainty (IU) is key in GAD, instigating the first 'what if?' questions that are commonplace in worry. Dugas et al. (1998) also highlight the contribution of positive beliefs about worry, with those with GAD expressing beliefs such as, 'worry helps me to be prepared for different situations' or that 'worry is helpful in problem-solving'. Additionally, poor problem-orientation is implicated, with those with GAD believing they have less control over problem solving, as well as a lack of confidence in their abilities to problem solve. Finally, the authors suggest that cognitive avoidance, in the form of verbal content of worry, is utilised as a means of avoiding distressing mental images. This model has many similarities with the

cognitive model of anxiety (Beck, 1979) and is later referred to as a cognitive-behavioural model of GAD (Dugas, Marchand & Ladouceur, 2005).

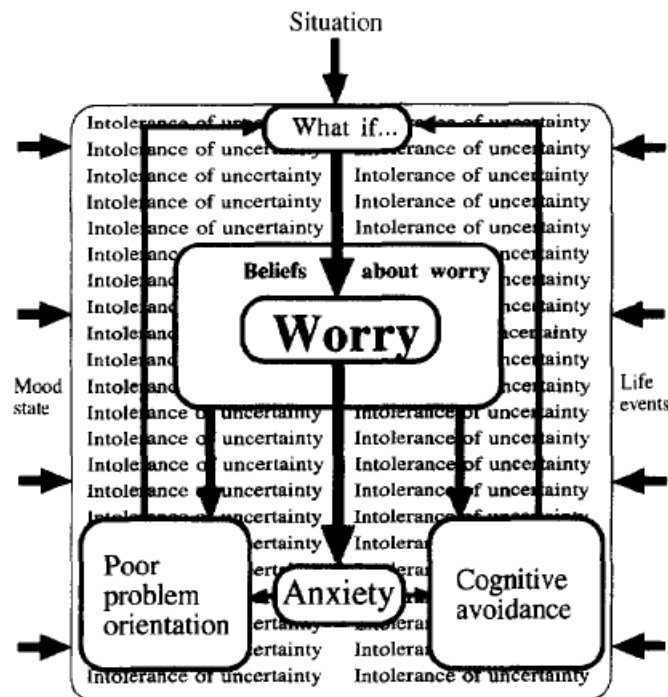


Figure 1. Intolerance of Uncertainty Model of GAD (Dugas et al. 1998, p. 216).

### 1.2.5.2 Evidence for the IU model of GAD.

Ladouceur, Gosselin and Dugas (2000) tested the IU model by experimentally manipulating uncertainty through a gambling task. Forty-two students were randomly assigned to either an increased or decreased intolerance of uncertainty group. Participants were assigned to a computerized roulette game task whereby those in the increased IU group received information suggesting that the 1 in 3 odds of winning were worse than other trials, and those in the decreased IU group received the same information, but it was reframed as being a higher probability than in other trials. A manipulation check was used and a significant difference was found between the level of IU between groups.

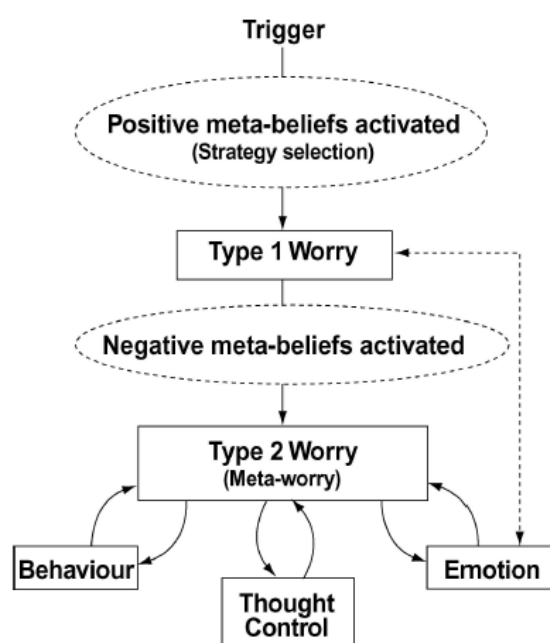
The results showed that there was a significantly greater level of worry in the increased IU group compared to the decreased IU group. The authors suggest that this research provides empirical support for the IU model of GAD, emphasizing IU as a key component in levels of worry. The research however lacks ecological validity and does not include pre- and post- measures so it is difficult to determine whether the difference in levels of worry changed as a result of the task, or are reflective of group differences. In addition, whilst a greater level of worry is induced as a result of the task, it doesn't necessitate that this is therefore implicit within GAD.

Further research by Dugas et al. (2005) however investigated the diagnostic and symptom specificity of the model using a clinical sample of GAD participants compared to participants with Panic Disorder (PD) using self-report measures. Of the four main features of the model (intolerance of uncertainty, positive beliefs about worry, poor problem orientation and cognitive avoidance), only intolerance of uncertainty had significantly greater scores in the GAD group. All components however were significantly related to worry, but unrelated to fear of bodily sensations, suggesting symptom specificity. The sample was determined using the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV), with any co-morbid diagnoses having a low severity rating, demonstrating a robust selection procedure. Participants however were not excluded if they were taking medication, which may have impacted the results.

### **1.2.5.3 Metacognitive Model of GAD**

Wells (1995, 2005) proposes the metacognitive model of GAD (Figure 2), which proposes that when faced with the object of their anxiety or an anxiety

provoking situation, people with GAD will utilise worry as an attempt to cope with the situation, internally posing a number of “what-if” questions. However, when the person experiences worry as inflexible and persistent, negative meta cognitive beliefs are triggered and result in worry about worry. The result is an increase in anxiety, that leads a person to utilise strategies such as thought suppression and reassurance seeking, in an attempt to reduce the anxiety. These strategies are counterproductive and can reinforce the negative beliefs held about worry. This then feeds back in to type II beliefs that worry is uncontrollable and dangerous, maintaining the worry cycle (Wells, 2005). GAD is then maintained by the reoccurring and conflicting positive and negative beliefs about worry, with the model emphasizing the role of metacognitions as key in its maintenance rather than more general maladaptive beliefs about the world or themselves. The model asserts that GAD is maintained through a vicious cycle whereby the bodily symptoms of anxiety and the metacognitions are interpreted as evidence of the harmful effects of worrying, and therefore the individual with GAD does not receive the internal feedback that it is safe to cease worrying.





*Figure 2. The Metacognitive Model of GAD (Wells, 1997, p. 204).*

#### **1.2.5.4 Evidence for the Metacognitive model of GAD.**

Wells and King (2006) investigated the use of manualized metacognitive therapy for GAD in 10 patients, assessing worry, anxiety and depression pre- and post- therapy. Diagnosis was established using the structured clinical interview for the DSM-IV, and participants were excluded if they had previously received CBT. The results showed that all participants improved after therapeutic input, and this change was statistically significant both post- treatment and at follow ups. Of the eight participants with complete data, all were shown to have made clinically significant improvement with 87.5% meeting criteria for recovery and 75% continuing to be classed as 'recovered' at the follow ups 6 and 12 months later. Whilst these results appear promising for metacognitive therapy, the data comes from a small sample, 20% of whom did not complete the required measures, and therefore it is difficult to assess how generalizable metacognitive therapy is. In addition, 50% of the participants had additional diagnoses, which whilst increasing the ecological validity of the sample, means that one cannot be certain individual improvements were solely due to the reduction of GAD symptoms. Clinically significant improvement was determined through the completion of pre- and post-measures of depression and anxiety however it is not known whether post-therapy participants continued to meet diagnostic criteria for GAD.

Van der Heiden et al. (2012) conducted an RCT comparing metacognitive therapy (MCT), intolerance of uncertainty therapy (IUT) and delayed treatment (DT) on symptoms of GAD, in an outpatient sample of 126 participants. In the same way MCT has been devised to combat the presumed mechanisms underlying GAD based

on the Metacognitive theory of GAD (Wells, 1995; 2005), IUT is based on the Intolerance of Uncertainty model by Dugas et al. (1998). Both interventions followed a 14 session structured framework outlined in manuals devised from the author's publications of the models. Assessment was undertaken pre- and post-treatment as well as at a six-month follow up.

The results showed that both MCT and IUT interventions were effective in reducing GAD symptoms, and that both interventions were better than DT. Participants who completed the MCT showed significantly fewer worry symptoms, as determined by the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger & Borkovec, 1990) and the Symptom Checklist (SCL-90; Derogatis, 1983) compared to those completing IUT. Taking in to account not just statistically significant change, but clinically significant change, MCT had more participants that achieved a clinically significant reduction in their scores compared to IUT. Both interventions however, were effective in reducing symptoms to a non-clinical level and 91% in the MCT group and 80% in the IUT group no longer met the diagnostic criteria for GAD post-intervention, with this rising to 93% and 90% respectively at the 6 month follow up. In contrast, only 5% of those in the DT achieved 'recovery' status.

Whilst the post-treatment results tend to highlight MCT as the superior intervention the difference between the treatments reduces by the 6 month follow up. In addition, later improvements to the IUT program were made by Dugas and Robichaud (2007) to improve results, however this was after the research was conducted. Notwithstanding this, the small differences in efficacy of the two tested interventions, both were shown to be useful in reducing GAD symptoms in a clinically significant way.

### **1.2.6 Summary**

GAD has been shown not only to impact on the individual's well-being and quality of life, but wider society in general through reduced work productivity and economic burden (Hoffman et al., 2008; Konnopka et al., 2008; Linden et al., 2011; Toghanian et al., 2014). The NICE guidelines advocate a stepped approach to intervention recommending the use of CBT, which whilst effective in treating symptoms of GAD (Coven et al., 2008; Hanrahan et al., 2013), has effect sizes that tend to be lower than for other anxiety disorders (Newman et al., 2008). Well-being therapy (Fava, 1999) has many similarities to CBT however it focuses on well-being rather than distress. Preliminary research with patients with GAD has shown that as an adjunct to CBT, it is more successful in ameliorating GAD symptoms than CBT alone (Fava et al., 2005). A number of theoretical models of GAD have been postulated with corresponding treatments that have been shown to be effective (van der Heiden et al., 2012). Whilst these models provide an account of the mechanisms maintaining GAD, Mennin, Heimberg, Turk and Fresco (2005) postulate that they do not adequately explain why someone with GAD may find the emotional experience so distressing that they engage in worrying to avoid it. It has been suggested that emotion regulation, which relates to the "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998, p.275), is therefore integral in explaining GAD. The Emotion Dysregulation Model for GAD (Mennin et al., 2002) is thus presented and discussed in the next section (section 1.3).

### **1.3 The Role of Emotion Regulation in GAD**

This section presents the Emotion Dysregulation Model put forward by Mennin and colleagues (2002), and provides a literature review critiquing the model and investigating whether emotion regulation difficulties are unique to GAD. Finally, this section considers some of the limitations of research in this area.

### 1.3.1 The Emotion Dysregulation Model of GAD

Mennin and colleagues have put forward an Emotion Dysregulation (ED) model of GAD (Mennin et al., 2002; Mennin et al., 2004), which postulates that those with GAD attempt to avoid distressing emotion due to difficulties regulating emotion, involving four components (Mennin et al., 2004). This is pictorially represented in Figure 3.

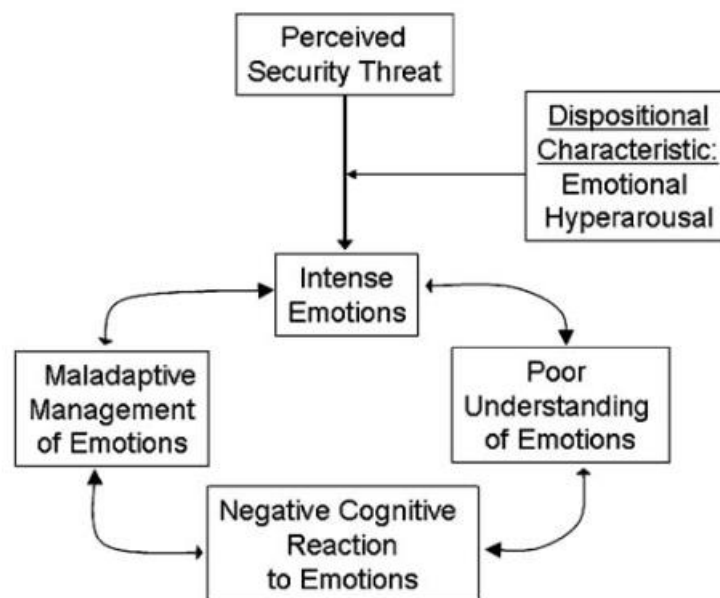


Figure 3. Emotion Dysregulation Model (Mennin et al., 2002) represented by Behar et al. (2009).

The first component asserts that individuals with GAD have a heightened intensity of emotions, and suggests they experience emotions more strongly than

others. A second component postulates that people with GAD have less of an understanding about their emotions than other individuals, and thirdly the model puts forward that those with GAD have more negative perceptions and fear of emotions. The fourth component suggests that those with GAD also have maladaptive methods of managing emotional responses and as such may find themselves in more distressing emotional states than they were in originally (Mennin et al., 2005).

These four components are said to be implicated in GAD in the following way. Firstly, within this model, individuals with GAD experience emotions more easily, quickly and intensely than their non-anxious counterparts and are also likely to express their emotions more frequently (heightened intensity of emotion). This combined with a poor understanding of emotions is said to bring about a fear of emotion, whereby individuals with GAD are overwhelmed and uncomfortable with the intensity of the emotion experienced and therefore become anxious, reinforcing the fear of emotion. The model also suggests that individuals with GAD are likely to be more hypervigilant to signs of emotion and either acutely attend to this emotional experience, or try to avoid it and turn their attention away. Finally, in response to these emotions, there is an attempt to minimise or control the emotions, or otherwise inappropriately express them (e.g. excessive worry). These are proposed as maladaptive emotion regulation strategies. It is suggested that by using these less helpful strategies, individuals may experience a heightening of negative affect, again reinforcing the fear of the emotion. A limitation of this model is that Mennin et al. (2005) do not provide any developmental context for this model, and therefore it is not explained, for example, why an individual with GAD might initially experience emotions more easily and intensely than others.

### **1.3.2 Research investigating an Emotion Dysregulation Model of GAD**

A review of the literature has been conducted looking at the role of emotion regulation in GAD in line with the model of emotion dysregulation put forward by Menhin et al. (2005). A literature review was conducted in this area, rather than a systematic review, because it best addresses the author's aim to provide a qualitative overview of the literature and research findings, rather than to critique the research in terms of pre-determined validity and quality. This therefore allows the reader to make their own judgements about the presented literature. It is acknowledged however, that there is a risk of subjectivity with this method and that it does not fully consider bias in a systematic way. An inter-rater reliability check may have been beneficial in addressing some of this. Given this, the current review of the literature represents just one point of view, and other authors may have taken an alternative approach, and selected and edited the data in different ways.

A literature search was conducted using Medline, CINAHL and PsycINFO databases in August 2013 to identify relevant research. The key search terms 'generalised anxiety', 'emotion dysregulation' and 'emotion regulation' were entered and whole documents searched. The same search was later conducted in August 2016 to identify any more recent research.

Studies were included if they a) used a sample of working age and older adults, b) used a standardised measure of GAD and c) used a standardised measure of emotion regulation. Case reports, dissertations, reviews and unpublished observations were excluded from the literature review to ensure comparability of the research reviewed. Additionally, studies that focused on neuro-biochemical aspects of emotion regulation were also excluded as this is beyond the scope of this thesis.

Limitations were set on language (English). In addition, citations included in relevant reports were inspected for additional eligible studies. The initial search yielded 96 studies, with the later search identifying an additional 30. These were subjected to a pre-selection process, where titles and abstracts were screened for relevance based on the inclusion criteria outlined above. A total of 12 articles were included in the current review (see figure 4 for a summary of the search procedure).

Table 1.1 provides a summary of the research and is structured by year of publishing and describes the study design, participant characteristics, outcome measures, the main results and whether the findings are consistent with the four components of the ED model of GAD. Research by Mennin et al. (2005) and Roemer, Lees, Salters-Pedneault, Erisman, Mennin and Orsillo (2009) have been separated within this review by study (e.g. study 1; study 2) to allow a clear exposition of the research and its results.

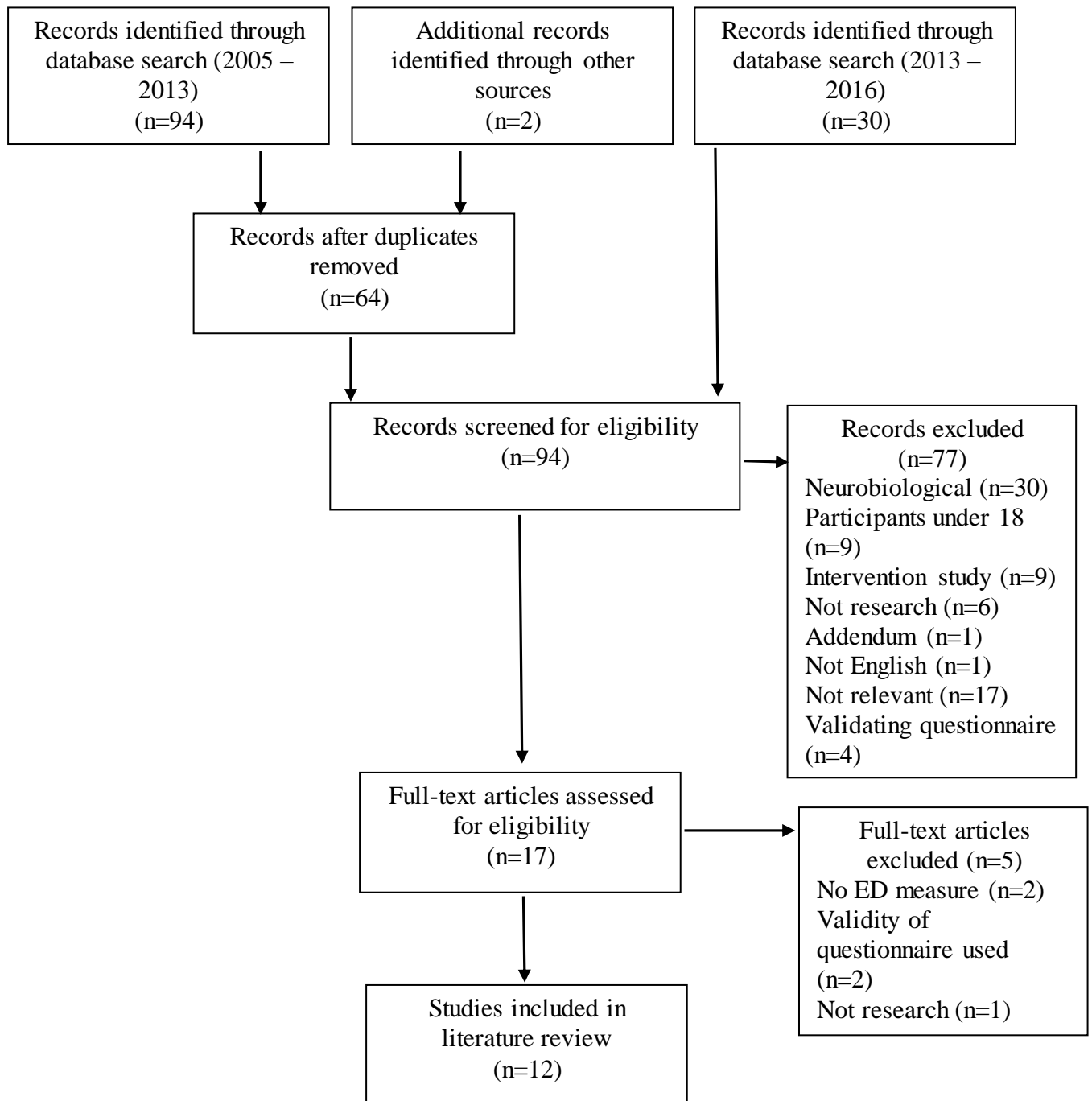


Figure 4. Summary of Search Procedure.



Table 1.1

*Research investigating the role of an Emotion Dysregulation Model in explaining Generalised Anxiety Disorder*

Author	Design	Sample characteristics	Primary Measures	Results	Emotion dysregulation model
1a) Mennin et al. (2005)  Study 1	Cross-sectional	Student analogue sample  GAD (n=47) Controls (n=491)	GAD-Q-IV; PSWQ; ACS; TAS-20; TMMS; BEQ	Participants with GAD symptomology displayed heightened intensity of emotions, poorer understanding of emotions, negative reactivity to emotions and maladaptive management of emotions.  The ED measures used to test the model were predictive of GAD status with 76.2% accuracy for controls, and 72.3% accuracy for GAD participants	1: Significant 2: Significant 3: Significant 4: Significant
1b) Mennin et al. (2005)  Study 2	Cross-sectional	Clinical sample  GAD (n=42) Controls (n=55)	ADIS-IV-L; ACS; TAS-20; TMMS; PSWQ	The results showed the GAD group reported a reduced understanding of emotions, a greater negative reactivity to emotions and maladaptive management of emotions (large effect sizes).  The ED measures used to test the model could predict GAD status with 92.9% accuracy.	1. Significant 2. Significant 3. Significant 4. Significant

1c)	Mennin et al. (2005)  Study 3	Quasi-experimental	Student analogue sample (group allocation based on cut off for GAD-Q-IV and PSWQ).  GAD (n=61) Control (n=61)	GAD-Q-IV; PSWQ; SMMS; BDI; MASQ	Mood was manipulated using music and pre and post measures issued.  The GAD group scored significantly lower than the control group in acceptance of and influence on emotions, lower in clarity of emotions (although this did not reach significance). No significant difference was found for typicality of emotions.	1. Significant 2. Non-significant 3. - 4. Significant
2)	Novick-Kline et al. (2005)	Cross-sectional	Student analogue sample (group allocation based on GAD-Q-IV)  GAD (n=73) Control (n=220)	GAD-Q-IV; PSWQ; LEAS	As determined by a rater-coded measure, participants in the GAD group had greater emotional awareness, rather than reduced emotional awareness as hypothesized by the ED model.	1. - 2. Significant (contradictory) 3. - 4. -
3)	Turk et al. (2005)	Cross-sectional	Student analogue sample (group allocation based on GAD-Q-IV and SIAS)  GAD (n=68) SAD (n=105) Control (n=550)	GAD-Q-IV; SIAS; PSWQ; ACS; TAS-20; TMMS; BEQ	Experiencing greater emotional intensity was unique to GAD participants. The significance of the ED model of GAD was found in comparison to controls only, not compared to participants with SAD.	1. Significant 2. Significant (controls only) 3. Significant (controls only) 4. Significant (controls only)

4)	Mennin et al. (2007) Study 2	Cross-sectional	Students (n=869)	GAD-Q-IV; BEQ; TMMS; TAS-20; ACS	Confirmatory Factor Analysis was used to investigate the ED model of GAD. The results found poor understanding of emotion, negative reactivity and maladaptive management of emotions were important in the predicting of GAD status. The inclusion of heightened intensity of emotions also adequately predicted GAD.	1. Significant 2. Significant 3. Significant 4. Significant
5)	McLaughlin et al. (2007)	Quasi-experimental	Analogue (group allocation using the ADIS-IV)  GAD (n=49) Control (n=44)	GAD-Q-IV; DERS; AIM; AAQ	Subsequent to a mood manipulation using film clips, those in the GAD group demonstrated poorer understanding, acceptance and management of emotions.  Heightened intensity of emotions was found in the GAD group, only for those in the 'worry' condition.	1. Significant (worried state) 2. Significant 3. Non-significant 4. Significant
6)	Decker et al. (2008)	Cross-sectional	Analogue (group allocation using GAD-Q-IV)  GAD (33) Control (105)	GAD-Q-IV; PSWQ; ERSQ; daily diary	No difference in ability to discriminate among emotions  GAD group have more intense daily emotional experiences	1. Significant 2. Non-significant 3. Significant 4. Non-significant
7a)	Roemer et al. (2009) Study 1	Cross-sectional	General population  n=395	GAD-Q-IV; PSWQ; DERS	Mindfulness and emotion dysregulation account for unique variance in GAD symptom severity.	1. Unspecified 2. Unspecified 3. Unspecified 4. Unspecified

7b)	Roemer et al. (2009)  Study 2	Cross-sectional	Clinical sample  GAD (n=16) Control (n=16)	ADIS-IV-L; PSWQ; DERS	Significant association between GAD, ED and aspects of mindfulness.  GAD group had greater emotion regulation difficulties than controls.	1. Unspecified 2. Unspecified 3. Unspecified 4. Unspecified
8)	Tull et al. (2009)	Cross-sectional	Student analogue sample (n=320)  GAD (n=99) PD (n=23) Non-clinical PA (n=17)	GAD-Q-IV; PDSR; DERS; ASI; DASS	PD was found to predict GAD status, however ED reliably predicted GAD status above and beyond anxiety sensitivity and PD.	1: Unspecified 2: Unspecified 3: Unspecified 4: Unspecified
9)	Maack et al. (2012)	Cross-sectional	General population  n=91	SCID-CV; DERS; BIS/BAS;	Behvioural Inhibition Sensitivity (BIS) contributes to GAD status.  ED a unique predictor of GAD diagnostic status.	1. Unspecified 2. Unspecified 3. Unspecified 4. Unspecified
10)	Marganska et al. (2013)	Cross-sectional	Student sample  n=284	GAD-Q-IV; DERS; RSQ; BDI	Secure attachment is associated with lower GAD, depression symptoms and ED.  Significant correlation between GAD and 5 subscales within DERS but not 'awareness'.	1: Significant (impulse) 2: Significant (clarity) 3: Unspecified 4: Significant (strategies)

11)	Tsypes et al. (2013)	Cross-sectional	General population (group allocation using SCID-IV)  GAD (n=59) Controls (n=66)	SCID-IV; DERS	ED mediated the relationship between GAD diagnosis and some sleep outcomes.  Linear regression confirmed relationship between GAD diagnosis and ED.	1. Unspecified 2. Unspecified 3. Unspecified 4. Unspecified
12)	Kerns, Mennin, Farach & Nocera (2014)	Cross-sectional	Students (group allocation using SCID-IV)  GAD (n=15) Controls (n=39)	SCID-IV; ERQ; DERS; MSCEIT (ability based measure)	Participants with GAD self-reported significantly greater difficulties with impulse control, non-acceptance of emotions and less frequent use of adaptive ER strategies.  Participants with GAD had greater deficits on ability based measure of emotional intelligence compared to controls.  Similar patterns of differences found on ability and self-report measures when comparing GAD and control group.	1. Significant 2. Non-significant 3. Unspecified 4. Significant

\*1 = Heightened intensity of emotions; 2 = Poorer understanding of emotions; 3 = More negative reactivity to emotions; 4 = Maladaptive management of emotions.

*Note.* GAD-Q-IV = Generalised Anxiety Disorder Questionnaire-IV (Newman, Zuellig, Kachin, Constantino, Przeworski, Erickson & Cashman-McGrath, 2002); PSWQ = Penn State Worry Questionnaire (Meyer et al., 1990); SIAS = Social Interaction Anxiety Scale (Mattick & Clarke, 1998); DERS = Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004); PDSR = Panic Disorder Self-Report (Newman, Holmes, Zuellig, Kachin & Behar, 2006); DASS = Depression and Anxiety Stress Scales; AIM = The Affect Intensity Measure (Larson & Deiner, 1987); BIS/BAS = Behavioural Inhibition Sensitivity/Behavioural Activation Sensitivity Scale (Carver & White, 1994); AAQ = The Acceptance and Action Questionnaire (Hayes et al., 2004); ACS = Affective Control Scale (Williams et al., 1997); TAS-20 = The Toronto Alexithymia Scale-20 (Bagby et al., 1994a; 1994b); TMMS = The Trait Meta-Mood Scale (Salovey et al., 1995);

Doctoral thesis: Does resilience mediate the relationship  
between emotion dysregulation and GAD?

Rebecca Webster

BEQ = The Berkley Expressivity Questionnaire (Gross & John, 1997); LEAS = Levels of Emotional Awareness Scale (Lane, Quinlan, Schwartz, Walker & Zeitlin, 1990); SCID -CV = Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (First, Spitzer, Gibbon & Williams, 1996); RSQ = Relationship Scales Questionnaire (Griffin & Bartholomew, 1994); ADIS-IV-L = The Anxiety Disorder Interview Schedule for DSM-IV - Lifetime version (DiNardo, Brown & Barlow, 1994); ERSQ = The Emotion Regulation Strategies Questionnaire (Feldman-Barrett et al., 2001)

### **1.3.3 Review of the literature**

#### **1.3.3.1 Research using a cross-sectional design**

Thirteen studies outline research using a cross-sectional design, with the majority of these using a general population or student sample [1a,2,3,4,6,7a,8,9,10,11,12] and two using a clinical sample [1b,7b]. Whilst it is likely to be easier to recruit a university student sample and gather an analogue group of those with GAD symptomology, the findings are likely to be less generalisable to a clinical population. University students also represent a sample of typically young adults who generally have a high level of functioning. Wittchen (2002) also found that GAD prevalence rates are highest in midlife and therefore the suitability of a student sample in researching GAD is questionable. Thus research using different methodologies and samples would be of benefit to the literature base.

Many of the research studies utilise standardised measures to create analogue groups of individuals with GAD symptomology meeting a certain threshold [1a,2,3,6,8,11,12] with the majority of studies using the Generalized Anxiety Disorder Questionnaire-IV (Newman et al., 2002) [1a,2,3,6,8] and the others using the Structured Clinical Interview for DSM-IV Axis I Disorders (First et al., 1996) [11,12]. The GAD-Q-IV is frequently used in research and its commonality within literature of this kind improves comparability between studies. It is based on the DSM-IV criteria and was originally designed to be used by comparing an individual's responses to the DSM-IV criteria for GAD to determine whether that person met the diagnostic criteria (Newman, Zuellig, Kachin, Constantino & Cashman, 2001). Newman et al. (2002) however later suggested scoring individual items and using a cut off score of 5.7 to determine the presence of GAD. There are

however concerns with using this method, given that a person may not endorse an item necessary for a clinical GAD diagnosis as determined by the DSM-IV criteria, but still be included within a GAD group in research. In addition, Ruscio et al. (2007) found that by relaxing the DSM-IV criteria and not requiring the set number and types of symptoms specified within the DSM-IV, this more than doubles the prevalence of GAD and therefore many sub-threshold GAD cases may be included within the sample, reducing the homogeneity of the sample.

Research utilising a clinical sample of treatment-seeking participants with GAD [1b,7b] confirmed the diagnosis using the Anxiety Disorder Interview Schedule for DSM-IV (ADIS-IV) (DiNardo et al., 1994), and an abbreviated form of the measure was used to ensure the absence of GAD in the control groups. The ADIS-IV has good psychometric properties and comprehensively assesses individuals based on DSM-IV criteria for anxiety and mood disorders. Roemer et al. (2009) recruited the control group in their research to match the participants recruited in the GAD group on age, gender and race. Matched group designs reduce the impact of potential confounding variables however at the same time does not retain the advantages of a random independent group design.

The research reviewed uses standardised self-report measures as the primary method of data collection [1a,1b,3,4,7a,7b,8,9,10,11] with the exception of Novick-Kline et al. (2005) [2] whose primary data was collected from observer-rated scores, Decker et al. (2008) [6] who used daily diaries designed to capture in-the-moment emotional experiences and Kerns et al. (2014) [12] who utilised both self-report measures and an ability based measure. The use of standardised measures that have good psychometric properties, ensures the reliability and validity of the data collected, allowing for data collection across large samples, as well as improving the



ability to directly compare between studies. It also allows the easy replicability of studies. One problem identified with self-report measures is that they rely on participants recalling information about themselves accurately and honestly. In addition, there can be common method variance (CMV), meaning that the research findings are attributable to the measurement method rather than the constructs that the measures are assumed to represent (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Interestingly, research using different methods of data collection provided different results [2,6].

### **1.3.3.2 Research using a quasi-experimental design**

Two of the research studies within the literature review use a quasi-experimental design [1c,5] to test the ED model of GAD (Mennin et al., 2002). The research differed in its experimental manipulation, either utilising music [1c] or film clips [5] to influence mood. Manipulation checks were conducted within each study to ensure the desired manipulation had been successful. Previous research (Gross & Levenson, 1995) has identified the utility of film clips in effectively eliciting mood states.

Both studies used an analogue sample within their research. Mennin et al. (2005) [1c] using the GAD-Q-IV and the Penn State Worry Questionnaire (PSWQ) (Meyer et al., 1990) to determine group allocation, with participants needing to meet the cut-off scores on both measures to be included in the GAD group. McLaughlin et al. (2007) however used the ADIS-IV to identify a GAD group and control group. Whilst this structured interview adds to the quality of the research, it appears that the homogeneity and clarity of the GAD diagnosis is at the expense of sample size and a subsequent reduction in power. As previously mentioned (section 1.3.1), these

measures have good psychometric properties and have been used within other research of this kind.

The use of a quasi-experimental design is necessary within this research given that random allocation cannot be performed, however lack of random assignment is a weakness of such a study (Harris et al., 2006). In contrast, the use of pre- and post-experimental manipulation, allows for causal inferences to be made that cannot be assumed within cross-sectional designs.

### **1.3.4 Is an Emotion Dysregulation model of GAD supported?**

Some of the research in this review specifically focuses on investigating the 4 components of the ED model of GAD [1a,1b,1c,3,4,5,6], some consider only parts of the ED model of GAD [2,10,12] and other research investigates emotion dysregulation in GAD more generally, maybe introducing an additional factor [7a,7b,8,9,11]. Research investigating the role of emotion dysregulation in GAD, found that participants with GAD symptoms had greater emotion dysregulation [7b], that there was a significant correlation between emotion dysregulation and GAD symptoms [7a,10], and that emotion dysregulation was found to predict GAD status [8,9]. To determine whether the ED model of GAD (Mennin et al., 2002) is supported within the literature reviewed, each of the four components of the model will be considered separately.

#### **1.3.4.1 Heightened Intensity of Emotions**

Nine studies show support for the first component of the ED model of GAD [1a,1b,1c,3,4,5,6,10,12]. The research showing support for a heightened intensity of emotions in individuals with GAD utilised different research designs, different samples and different methods of data collection. Within the research by Decker et al. (2008), 138 undergraduates completed daily diaries asking them to rate their

subjective emotional experience of the most intense emotion felt that day.

Participants were required to describe the situation leading to the emotional experience and rate nine emotions on a 5-point scale according to how much they experienced them. From participant responses, a positive emotional intensity index, a negative emotional intensity index and overall momentary intensity index were determined. The results found that there was no difference in the frequency of the positive emotions experienced between the analogue GAD group and the control participants, and the intensity of the positive emotions did not significantly differ between the groups. However negative emotions were experienced significantly more intensely than controls, as determined through the daily diaries, which may explain their increased motivation to escape them (Decker et al., 2008). Research by Mennin et al. (2007) also found heightened intensity of emotions to be related to GAD symptoms (as determined by the GAD-Q-IV), however the confirmatory factor analysis suggests that this component is not necessary for predicting GAD status, despite being an adequate predictor of GAD status.

#### **1.3.4.2 Poor Understanding of Emotions**

The second component of the ED model of GAD finds support in six studies [1a,1b,3,4,5,10], whilst two report non-significant results [1c,6]. In contrast to the ED model of GAD, Novick-Kline et al. (2005) find that participants with GAD showed a better understanding of their emotions. In contrast to the other research, Novick-Kline et al. (2005) utilised observer ratings of emotional awareness, and therefore the different findings may be a product of the different methodologies. The authors suggest that people with GAD may 'perceive' difficulties in emotional awareness (as shown through self-report measures) rather than having 'actual' difficulties in emotional awareness (as shown through observer reports). Given the

high level of worry that those with GAD experience, a distortion of their perceived abilities may be another expression of their GAD symptomology, and thus influence the resulting data of self-report measures.

Additionally, Turk et al. (2005) [3] reports that participants in the analogue GAD group show a poorer understanding of emotions in comparison to a control group, however the same statistically significant difference is not found when comparing to an analogue group with Social Anxiety Disorder (SAD). This suggests that a poorer understanding may not solely be associated with GAD, but may be more widely implicated in other anxiety disorders.

#### **1.3.4.3 Negative Reactivity to Emotions**

Of the reviewed literature, five studies support this component of the ED model of GAD [1a,1b,3,4,6] whilst one study reports results that do not reach statistical significance [5]. Similar to the results for 'poor understanding of emotions', Turk et al. (2005) [3] report significant differences, only in regard to comparisons with the control group, not the analogue SAD group, again suggesting some similarities in emotion dysregulation between GAD and SAD. The studies showing support for greater negative reactivity to emotions in GAD all utilised a cross-sectional design, however in contrast, McLaughlin et al. (2007) [5] did not find a statistically significant difference and utilised a quasi-experimental design. Within the research [5], 49 participants met the GAD-Q-IV cut off for GAD, and 44 participants classified as a control group. Those in the GAD group were also separated into those with dysphoria and those without. Participants completed a battery of questionnaires assessing depression symptoms, emotion regulation, intensity of emotions and experiential avoidance. Participants were then randomly assigned to either a worry, neutral or relaxation condition. A five-minute induction

procedure was conducted dependent on condition, whereby participants were asked to write down a list of their most worrisome topics, things they did last weekend (neutral) or their most pleasant events (relaxed). Subsequent to the induction period, participants completed the measures.

The results showed that there were significant differences between the groups at baseline, with those in the GAD group reporting greater emotion dysregulation than controls. GAD participants high in dysphoria reported less acceptance of emotions than those low in dysphoria, and both groups showed significantly less acceptance than the control group. GAD participants reported greater negative emotional intensity than controls. There was however, no significant difference in terms of negative reactivity to emotions. The quasi-experiment has the benefit of measuring before and after a mood manipulation however it can be questioned whether the use of a writing task effectively created the desired mood. Manipulation checks were conducted three times over the five-minute induction period, however the frequency of these checks may have highlighted the artificiality of the induction, and thus impacted the efficacy of particularly the worry induction.

#### **1.3.4.4 Maladaptive Management of Emotions**

Eight of the studies within this literature review find support for the role of maladaptive management of emotions in GAD [1a,1b,1c,3,4,5,10,12]. In contrast, Decker et al. (2008) [6] report no significant difference between the GAD analogue sample and the control group in terms of the use of emotion regulation strategies as measured by the ERSQ. Whilst there is no overall difference reported, when breaking the measure down into its subscales, there are some differences in particular emotion regulation strategies. Decker et al. (2008) found that participants within the GAD analogue group reported using distraction, rumination and situation

selection more frequently than participants in the control group. Situation selection refers to either using or avoiding environmental stimuli in an attempt to manage feelings. Decker et al. (2008) also reported that participants in the GAD group were more likely to mask, hide and soothe emotions, than those in the control group. Decker et al. (2008) therefore conclude that the results are not in keeping with the ED model, due to participants in the ED group reporting use of a wide range of emotion regulation strategies, rather than a rigid and limited range of strategies. Despite this, it would appear that participants in the GAD group are more likely to use a number of maladaptive strategies, such as rumination, and hiding and masking emotions.

The results of the research [6] appear inconclusive and are in contrast to the other reviewed literature. Decker et al. (2008) utilised the ERSQ, a 9-item questionnaire which may have influenced the findings, given that all other reviewed research uses either the DERS [5,10,12], or the combination of 4 questionnaires (TAS-20, ACS, TMMS and BEQ) originally used by Mennin et al. (2005) [1a,1b,1c,3,4].

### **1.3.5 Summary**

The research reviewed suggests that emotion dysregulation is related to GAD status, and moreover, that emotion dysregulation predicts GAD status. There is however less conclusive evidence regarding the four components of emotion regulation model of GAD (Mennin et al., 2005). In particular, there are conflicting findings regarding the role of poor understanding of emotions within participants with GAD. This may be in part due to methodological differences between the studies, and differences between participant's self-reported perception of their

understanding of emotions, compared to observer-rated understanding of emotions (Novick-Kline et al., 2005).

Some limitations of the reviewed research have been highlighted regarding the representativeness of the samples used within such research and common method variance. Research has also considered whether emotion dysregulation is unique to GAD status, or whether it represents a more general relationship to anxiety disorders, or even psychopathology (Turk et al., 2005). In addition, research has considered the role of additional factors involved in the relationship between emotion dysregulation and GAD symptoms, such as attachment styles and sleep.

This research will further investigate the emotion regulation model of GAD, drawing on more contemporary measures than those used by Mennin et al. (2005), and considering differences between those with GAD and those without GAD symptoms. The next section will consider the role of another factor, resilience, and its links to both emotion dysregulation and GAD.

#### **1.4 Resilience**

Despite resilience being a construct that has been researched over a number of years, there remains a lack of consensus about what resilience is and what it encompasses (Davydov, Stewart, Ritchie & Chaudieu, 2010). This section will first consider the definition of resilience and present two means of conceptualizing resilience that are used within research; firstly that resilience is a personality trait and secondly, that resilience is a multi-dimensional construct. A literature review will then be presented examining the current literature around resilience and anxiety.

Finally, the relationship between resilience and emotion dysregulation will also be explored, drawing particularly on a model of resilience (Troy & Mauss, 2011).

### **1.4.1 Defining Resilience**

The concept of resilience stemmed from the desire to understand why two people may go through the same adverse situation and one may go on to develop serious difficulties and the other may lead a healthy and fulfilling life (Waller, 2001). Traditionally the emphasis of psychological research had been largely based on a deficit model with the focus on psychological dysfunction (Ryff & Singer, 1996). Resilience originates in work by Maslow (1954), however, the rise of ‘positive psychology’ (Seligman, 1998) triggered a renewed interest in identifying and investigating protective factors and consequently highlighted the role of resilience.

Resilience is a concept that has proved difficult to define, and as such is difficult to measure. So much so, that Davydov, et al. (2010) assert that the disparity in the components of resilience have called in to “question the utility of resilience as a theoretical construct” (p.486). Despite this, efforts have been made to consolidate the research and bring together a unified definition of resilience. Below are two theories used to explain the construct of resilience. Traditionally, research focused on resilience as solely being a personality trait that was static and innate (section 1.4.2), however resilience is more nuanced than merely a state or trait. More recently resilience has been conceptualised as representing a range of resources that can be drawn upon and cultivated in the face of adversity (section 1.4.3) and therefore can be taught and developed in individuals, as demonstrated by research involving resilience training (e.g. Sood, Prasad, Schroeder & Varkey, 2011; Schiraldi, Jackson,



Brown & Jordan, 2010). The latter conceptualisation of resilience is more commonly used within contemporary research, and as such is the theoretical understanding of resilience adopted within this research.

#### **1.4.2 Resilience as a Personality Trait**

Friborg, Barlaug, Martinussen, Rosenvinge and Hjemdal (2005) conducted research investigating resilience in relation to personality and intelligence. The research compared resilience, as measured by the Resilience Scale for Adults (RSA; Hjemdal, Friborg, Martinussen & Rosenvinge, 2001) with the 'Big Five' (NEO-PI: Costa & McCrae, 1985) measure of personality, social intelligence (TSIS) and cognitive abilities (Raven's Advanced Matrices). The Big Five refers to the five broad personality dimensions measured within the NEO-PI, namely neuroticism, extraversion, openness, agreeableness and conscientiousness, which are relatively stable across the lifespan (Soldz & Vaillant, 1999). Of the Big Five personality characteristics, emotional stability (lower levels of neuroticism) were associated with the 'personal strength' facet of the RSA, extroversion and agreeableness were associated with the 'social competence' element of the RSA and conscientiousness was associated with 'structured style' (RSA). The results also investigated the degree of variance that resilience shares with personality, finding that agreeableness, conscientiousness and emotional stability (low levels of neuroticism) accounted for most resilience factors and the five personality characteristics explained 37.8% of the variance in the resilience scores.

This demonstrates the interlinked nature of resilience and personality, however there remains around 62% of the variance in resilience scores unexplained by the big five personality traits. The research by Friborg et al (2005), was

conducted using 482 individuals applying to a military college, with 403 of these being male. Whilst this sample was large, it may be confounded by gender and also by job role. Research has suggested that personality may influence the type of job or course people apply for (e.g. Ackerman & Beier, 2003), and therefore individuals applying to military college may represent a group with a very distinct set of character traits, questioning the ability to generalize this research beyond such a specific participant group. In addition, the Norwegian military version of the Big Five personality scale (Engvik, 1993) was used, highlighting potential problems with the validity and reliability of the transformed questionnaire.

Research by Campbell-Sills, Cohen and Stein (2006) also considered the relationship of personality and resilience, recruiting 132 students who completed a battery of measures including the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) and the NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992). The results found that resilience scores were significantly correlated with neuroticism (inverse relationship), extraversion and conscientiousness, with the strongest relationship being found inversely with neuroticism. The researchers also conducted hierarchical multiple regression analyses including both personality and coping styles (task-oriented and emotion-oriented subscales of the Coping Inventory for Stressful Situations; Endler & Parker, 1999) in the prediction of resilience. Neuroticism, extraversion and conscientiousness were found to be significant predictors of resilience accounting for 57% of the variance. When the coping styles were also included, the regression model explained significantly more variance (67%), however with the inclusion of task-oriented coping, conscientiousness failed to be a significant predictor. Mediation analyses revealed this to be due to task-

oriented coping, mediating the relationship between conscientiousness and resilience.

Therefore, whilst the research demonstrates the strong associations between resilience and personality, it also finds that there are other components implicated, such as coping style. The research is limited by its use of a solely student sample, particularly because it is suggested that although personality traits are changeable throughout the lifespan, they tend to show most change in early adulthood between the ages of 20 – 40 years old (Roberts & Mroczek, 2008).

Conceptualising resilience as a personality trait, suggests that it may be a stable characteristic that shows little change across the lifespan, and is the result of internal influences (e.g. personality) rather than external influences (e.g. social circumstances). Rutter (2006) however, suggests that resilience is a dynamic process by which one can become more or less resilient, and the next section will discuss resilience as a multi-dimensional process.

### **1.4.3 Resilience as a Multi-Dimensional Process**

Current theories of resilience provide another means of definition; not as a uni-dimensional construct, but as multi-dimensional (Campbell-Sills, Cohan & Stein, 2006). In this way, resilience not only includes temperament and personality, but also refers to the use of specific skills, such as problem solving skills that aid recovery from traumatic and difficult circumstances. Resilience is therefore more of a process by which someone recovers from adversity (Rutter, 1985) and maintains a healthy level of functioning or successful adaptation in the face of a significant trauma or adversity (Luthar, Cicchetti & Becker, 2000; Masten & Obrdovic, 2006), In addition, research (Richardson, 2002; Bonanno, 2004) also suggests that there can

be a continued experience of positive growth as a result of adversity. Given this, resilience is not only an internal sense of well-being, but an external adaptation in the face of adversity or stressors.

Furthermore, it is asserted that resilience is not a static or fixed process, but is dynamic, and therefore individuals at any time might be more or less resilient depending on the specific trauma or adversity that they are faced with (Charney, 2003), the time period in which the adversity presents itself, and the opportunities which avail themselves within that situation (Ahmed, 2007). Additionally, a number of factors may promote resilience (Ahmed, 2007) such as beliefs and attitudes, coping strategies and psychosocial cohesion.

Gooding, Hurst, Johnson and Tarrrier (2012) conducted research considering both young adults (18 – 26 years) and older people (over 64 years) and demonstrated differences across the life span. Results showed that older people showed greater overall resilience, and this was related to their ability to problem-solve and regulate their emotions. Conversely, young adults tended to have better social support. This research demonstrates that there are differences in resilience at different stages in life, and therefore supports the idea that resilience is multi-faceted and changing.

Herrman, Stewart, Diaz-Granados, Berger, Jackson and Yuen (2011) review the different definitions of resilience and conclude that whilst there are conceptual differences in the understanding of resilience, these are not as significant as might be assumed. For example, the research by Gooding et al. (2012) shows that there appear to be different resources available to a person, such as social support, problem-solving skills and emotion regulation, that people can be drawn upon, to different extents, to demonstrate resilience in the face of adversity. In addition, Herrman et al. (2011) found that researchers tend to use similar domains when

researching resilience and therefore conclude that research is comparable. For example, researchers tend to agree that for an individual to exhibit resilience, an individual must experience adversity and show consequential positive adaptation (Fletcher & Sarkar, 2012) and therefore the underlying construct of resilience is equivocal.

Within the current research, resilience is understood as both a state and trait concept, that is that it is multi-dimensional and encompasses personality traits as well as developed characteristics and resources, such as problem-solving skills, sense of humour, and engaging in social support.

#### **1.4.4 Resilience and Anxiety**

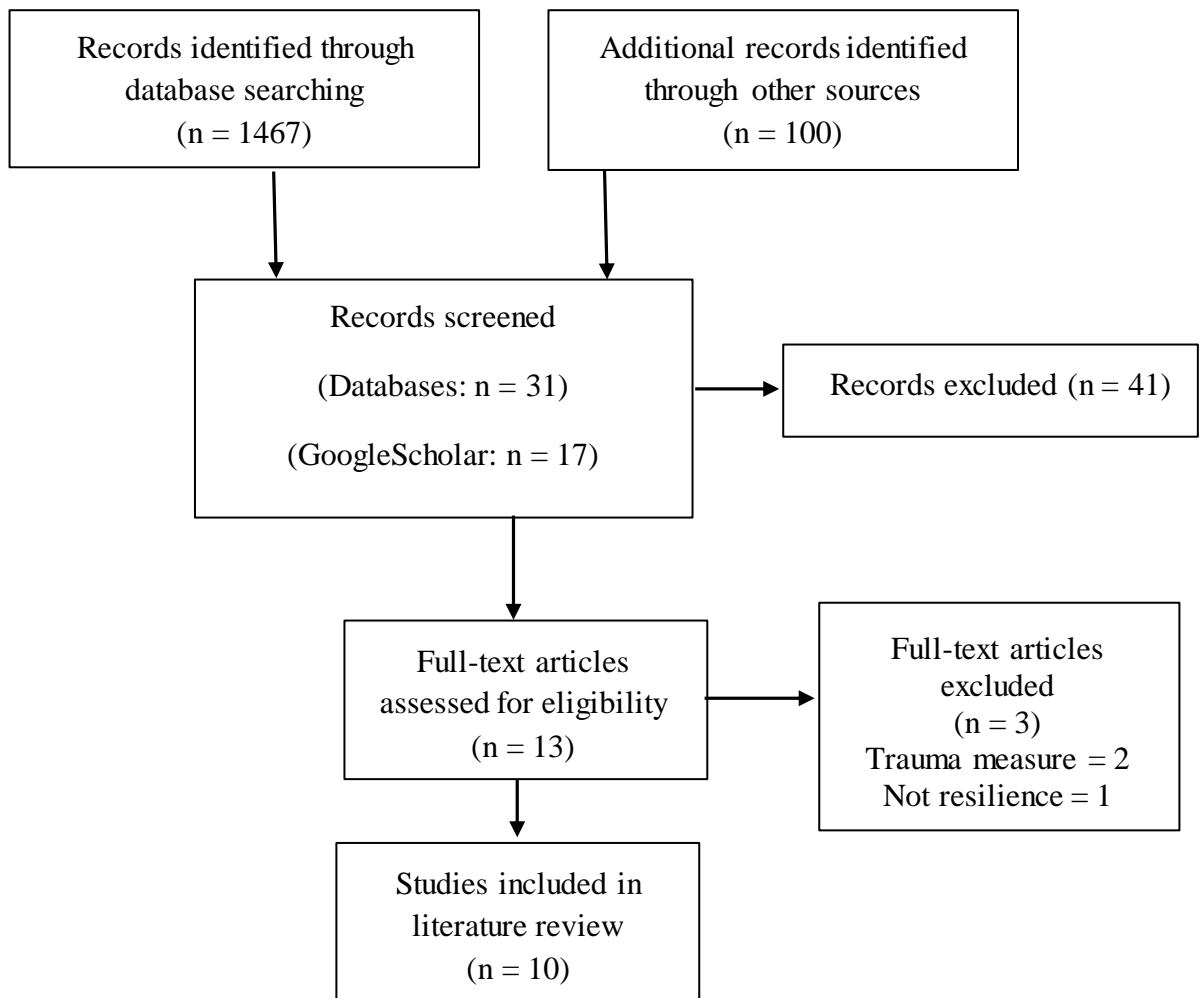
For the purpose of this research, a literature review was conducted to look at the relationship between resilience and anxiety. A search was conducted in PsycARTICLES, PsycINFO and Science Direct in January 2016, including journal articles printed after 2010 with additional parameters to restrict results as follows: mental health, social, patient, mental, anxiety and participant, to avoid the search returning results not pertaining to human resilience. The key search terms used are as follows:

1. Anxiety
2. Resilien\*
3. 1 AND 2

Studies were included if they: a) used a sample of adults, b) a measure of anxiety and c) measure of resilience. Case reports, dissertations, conference presentations, and unpublished observations were also excluded from the study in

order to ensure the quality and comparability of studies involved in the current literature review. In addition, research using animal subjects was excluded, as well as studies that focused on neuro-biochemical aspects of anxiety or resilience. Additionally, research that focused on aspects of health adjustment or trauma were excluded, on the basis that these are not typical experiences and may confound the results. Limitations were set on language (English). In addition, citations included in relevant reports were inspected for additional eligible studies. A search was also conducted on Google scholar using the same key words and date parameters producing 17 results meeting criteria. Four of these were duplicates and therefore removed.

The initial search yielded 1467 studies which underwent a pre-selection process where titles and abstracts were screened for relevance based on the inclusion criteria outlined above. Eleven papers were read to determine eligibility. A total of 10 articles were included in the current review (see figure 5 for a summary of the search procedure).



*Figure 5. Summary of Search Procedure.*

Details of the literature reviewed can be found in table 1.2, which provides a summary of the research and is structured by year of publishing and describes the study design, participant characteristics, outcome measures, and the main results.

Table 1.2

*Research investigating the association between resilience and anxiety.*

	Author	Design	Sample characteristics	Primary Measures	Results
1)	Bitsika, Sharpley & Peters (2010)	Cross-sectional	401 (48% females) Non-clinical (undergraduate students)	CD-RISC, Zung-SAS, Zung-SDS	Those scoring above cut-off for clinical significant anxiety had significantly lower resilience scores.
2)	Schiraldi, Jackson, Brown & Jordan (2010)	Within subjects, pre-test and post-test design	37 (60% female) Non-clinical (undergraduate students)	RS-14, LOT-O, SES, Schiraldi Self-Esteem Check-up, STPI-Dep, STPI-Anx, STPI-Ang, STPI-Cur	Resilience program increases positive adaptation (e.g. resilience, optimism, happiness) and reduces mental health indicators (e.g. anxiety, depression).
3)	Burns, Anstey & Windsor (2011)	Cross-sectional	3989 (53% female) Non-clinical (general population sample)	CD-RISC, PMS, PANAS, DAI	A statistically significant small negative correlation between resilience and anxiety. Well-being mediate the relationship between resilience and anxiety with a very small but significant direct and indirect effect.
4)	Sood, Prasad, Schroeder & Varkey (2011)	Randomised Controlled Trial (RCT)	32 (Intervention: 20 (45% female); Wait list: 12 (50% female))  Non-clinical (Hospital Physicians)	CD-RISC, PSS, SAS, LASA	Subsequent to resilience training (SMART) there was a significant increase in resilience and a reduction in anxiety and stress. There were no significant changes in the scores of participants in the waiting list.



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5)	Bitsika, Sharpley & Bell (2013)	Cross-sectional	108 (68% female) Non-clinical (parents of children with ASD)	Zung-SAS, Zung-SDS, CD-RISC	A significant negative correlation was found between resilience and anxiety and depression. Parents were divided into high and low resilience groups and the results found low resilience scores were associated with higher anxiety and depression. Resilience was associated with anxiety and depression, in parents with high daily stress, but not those with low daily stress.
6)	Min, Yu, Lee & Chae (2013)	Cross-sectional	230 (57.2% female) Clinical (meeting DSM-IV criteria for anxiety and depression)  30% Anxiety Diagnosis	Korean versions of:  CERQ, CD-RISC, BDI, STAI	Adaptive emotion regulation strategies, particularly refocusing on planning and positive reappraisal, were significantly correlated with resilience.  Depression, anxiety and resilience showed significant correlations and regression analyses found that greater resilience predicted lower anxiety, less frequent rumination.
7)	Hou & Ng (2014)	Cross-sectional	284 (82.4% female) Non-clinical (university students)	Chinese versions of:  RS; RPA-EF; RAS;  STAI-S	Emotion-focused positive rumination mediated the inverse association between trait resilience and anxiety symptoms.

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8)	Hegberg & Tone (2015)	Cross-sectional	222 (77% female) Non-clinical (undergraduate students)	GPAQ-2, CD-RISC-10, STAI-T	For those with high trait anxiety, physical activity (PA) was associated with resilience. The results showed that trait anxiety moderated the association between resilience and PA.
9)	Min, Lee & Chae (2015)	Cross-sectional	436 (56.1% female) Clinical (meeting DSM-IV criteria)  31% Anxiety Diagnosis	Korean versions of:  CTQ, CD-RISC, FSSQ, BDI, STAI, AUDIT	A significant interaction was found between resilience and anxiety. High resilience and low anxiety buffered against suicidal ideation
10)	Shi, Liu, Wang & Wang (2015)	Cross-sectional	2925 (64.9% female) Non-clinical (Chinese medical students)	Zung-SAS, BFI, RS-14	Resilience mediated between personality traits (agreeableness, openness and conscientiousness) and anxiety

Note. CERQ = Cognitive Emotion Regulation Questionnaire (Garnefski, 2001); CD-RISC = Connor-Davidson Resilience Scale (Connor & Davidson, 2003); BDI = Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961); STAI = State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983); CTQ = Childhood Trauma Questionnaire (Pennebaker & Susman, 1988); FSSQ = Functional Social Support Questionnaire (Broadhead, Gehlbach, DeGruy & Kaplan, 1988); AUDIT = Alcohol Use Disorder Identification Test (WHO, 2001); Zung-SAS = Zung Self-Rating Anxiety Scale (Zung, 1971); Zung-SDS = Zung Self-Rating Depression Scale (Zung, 1965); PMS = Personal Mastery Scale (Pearlin, Menaghan, Lieberman & Mullen, 1981); PANAS = Positive and Negative Affect Schedule (Watson, Clark & Tellegen, 1988); DAI = Goldberg Depression and Anxiety Inventory (Goldberg, Bridges, Duncan-Jones & Grayson, 1988); GPAQ-2 = Global Physical Activity Questionnaire (World Health Organisation, 2001), CD-RISC 10 = Connor-Davidson Resilience Scale 10 items (Campbell-Sills & Stein, 2007); STAI-T = State-Trait Anxiety Inventory- Trait section (Spielberger, Gorsuch & Lushene, 1970); HADS = Hospital Anxiety and Depression Scale (Snaith, 1983; Mykletun, Stordal & Dahl, 2001); DRS-15 = Dispositional Resilience Scale (REFERENCE); BFI = Big Five Inventory (John & Srivastava, 1999); RS-14 = Wagnild and Young Resilience Scale (Wagnild & Young, 1993); LOT-O = Scheier & Carver Life Orientation Test – Optimism (Scheier & Carver, 1985); SES = Rosenberg Self-Esteem Scale (Rosenberg, 1965); STPI = State Trait Personality Inventory

(Spielberger, 1979); PSS = Perceived Stress Scale (Cohen & Williamson, 1988); SAS = Smith Anxiety Scale (Smith, Hancock, Blake-Mortimer & Eckert, 2007); LASA = Linear Analog Self Assessment Scale (Locke, Decker, Sloan et al., 2007)

### **1.4.5 Review of the literature**

The majority of research included in the review utilised a non-clinical sample [1,2,3,4,5,7,8,10]. The research also showed a wide variety of recruitment pools, with most utilising a student sample [1,2,7,8,10] however other research using parents [5], the general population [3] or hospital physicians [4]. Using student samples provides a convenient and quick access to a sample group but the resulting data are less generalizable to the rest of the population given the ‘narrow database’ (Sears, 1986). Sample sizes range greatly between the research, from 32 [4] to 3989 [3]. The majority of research studied used a cross-sectional design [1,3,5,6,7,8,9,10] whilst the other studies utilised a within subject, pre- and post-test design [2] or a Randomised Controlled Trial (RCT) design [4].

Only 2 studies included in the present literature review utilised a clinical population [6,9]. Whilst clinically relevant in terms of diagnosis, depression, anxiety and resilience scores with the aforementioned studies were all transformed into dichotomous groups, indicating high or low symptoms, and therefore data will have been lost in the analyses. In both studies, a clinical population of participants with a DSM-IV classified anxiety or depressive disorder was recruited, from the same Anxiety and Mood Disorder clinic in Korea. Given the overlapping recruitment periods (between February 2011 and January 2012), it is plausible therefore, that some participants, may have taken part in both studies and therefore caution must be taken when comparing the research, as the data may not be from two distinct sample groups.

A further limitation of both studies utilising a clinical population [6,9] is that the type of anxiety disorder the participant is diagnosed with isn’t specified, and

information regarding the level of treatment received thus far is not discussed. The symptoms of different anxiety disorders vary and therefore bringing together those with anxiety disorders into one homogenous group may miss differentiations in the interactions between different anxiety diagnoses. Again considering the sample of these studies [6,9], there are between 15-18% with comorbid diagnoses of depression and anxiety, which although commonly seen in clinics, reduces the ability to clearly differentiate between the two diagnostic categories.

When measuring resilience, all the research reviewed used the CD-RISC, thereby enabling clear comparisons to be made between studies. The CD-RISC is a well-validated measure and shows good psychometric properties, and Windle, Bennet and Noyes (2011) found in their review of resilience measures, that the CD-RISC was one of the best measures of resilience. Some of the research however, found that the sample they used had lower scores on the CD-RISC than might be expected [4] given Connor & Davidson's validation data (Connor & Davidson, 2003). For example, Sood et al. (2011) [4] found that the two groups recruited within the pilot study scored means of 68 and 69.6, which were more in line with the psychiatric outpatients in the original validation data. At the end of the SMART intervention, the mean resilience score was 79.4, however this was only comparable to general population data. It may be that there is a disparity between the samples used and the general population, reducing the generalisability of the research data beyond the participants used [4]. However, it could also be that levels of resilience in general have reduced since the original validation data was collected over a decade ago.

There is less consensus with regard to the choice of anxiety measures amongst the research, with 5 different anxiety measures used across the 10 studies. The

majority used either the STAI [6,7,8,9] or the Zung-SAS [1,5,10] however some studies used the STPI-Anx [2], DAI [3], and SAS [4]. Even though 4 studies utilised the STAI, 2 of these used a Korean version [6,9], one used the trait scale only [8] and one used the state scale only [7], thus highlighting the disparity between the use of anxiety measures. All of these measures demonstrate good psychometric properties, however the studies using the Korean version of the STAI [6,9] do not provide data about its validity and reliability as a measure and therefore it is difficult to assess its appropriateness for use.

#### **1.4.6 Are high levels of resilience associated with low levels of anxiety?**

The research reviewed demonstrates a correlation between anxiety and resilience, in both clinical [6,9] and non-clinical samples [3,5,7,8]. Research comparing group means based on either high and low resilience scores [5] or high and low anxiety scores [1], demonstrates that those with high resilience have low levels of anxiety, and vice versa. Whilst this research demonstrates an association between resilience and anxiety, they are not able to determine causation, that is, whether resilience protects, or buffers, against anxiety symptoms. A number of studies used regression analyses [6,9], mediation analyses [3,7,10], or moderation analyses [8] and thus were able to infer causation.

Min et al. (2013) [6] utilised a treatment seeking, clinical sample, and administered a number of standardised measures (see table 1.2). Using regression analyses, the study [6] found that both low levels of depression and anxiety were predictive of greater resilience. In addition, they found that less engagement in rumination independently contributed to participants with depression and/or anxiety disorders. One limitation of this research however is the lack of distinction between anxiety disorder diagnoses, instead the over-arching term of anxiety disorders is

utilised throughout. In addition, within the sample, only 30% had a single diagnosis of an anxiety disorder, with the remaining sample either having depression, or comorbid anxiety/depression diagnoses. Whilst representative of the mood disorders in general, it limits the ability to determine factors particularly implicated in anxiety disorders.

Research has also highlighted that the relationship between resilience and anxiety is only apparent in particular conditions [1,8]. Hegberg and Tone (2015) [8] found that there were differences shown for the association with resilience, for participants with low and high trait anxiety. The researchers used hierarchical regression analyses to determine whether trait anxiety moderated the association between physical activity (PA) and resilience. The results showed that it was for those with high trait anxiety, that PA was positively related to resilience, whereas for those with low trait anxiety, exercise did not show a significant positive relationship with resilience. The authors therefore concluded that PA may be most useful in facilitating resilience in those with a greater likelihood of developing stress-related/anxiety related disorders.

Additionally, Bitsika et al. (2013) [1] conducted research investigating the effect of resilience to buffer against anxiety and depression using a sample of parents of children with an Autistic Spectrum Disorder (ASD). The research utilised the Zung Self-Rating Anxiety Scale (Zung, 1971) and found that nearly half of the mothers (45%) and fathers (47.7%) met criteria for clinically significant anxiety. The results showed that there was a significant negative correlation between resilience and anxiety and depression, and that the relationship between anxiety symptoms and resilience was more evident for those with high stress in comparison to those experiencing low stress levels. This again suggests that there is an

additional component, stress, that effects the relationship between resilience and anxiety. Stress levels however were measured using a single question and Likert scale, and therefore the validity and reliability of the question is unknown.

In addition, two studies looked at the effects of a resilience training program to increase resilience and reduce anxiety symptoms [2,4] to determine whether resilience programs can reduce anxiety and improve well-being. Schiraldi et al. (2010) [2] utilised a resilience training intervention that consisted of 30, 75-minute sessions delivered twice a week. Participants were required to complete a battery of self-report measures before and after the intervention. The results showed statistically significant results despite low anxiety, depression and anger scores to start with, demonstrating its utility with those without clinically significant symptoms. Only a small effect size was found for anxiety, however Walter et al. (2010) have noted that for resilience programs, even small effect size can be meaningful in real terms, given that such intervention is expected to have a cumulative effect over the course of the training. Despite the positive results, no comparison group was used and therefore it is difficult to determine if the results are the result of the intervention, or spontaneous improvement.

Sood et al. (2011) [2] used a single 90-minute intervention designed to teach resilience, with an additional session available if required. In addition, relaxation techniques were taught which the participants were expected to use daily. In this study, Sood et al. (2011) adopted a robust empirical approach by adopting a randomised controlled trial with a wait list control condition. Psychometric measures reporting excellent validity and reliability assessing anxiety symptom level and resilience were administered at baseline and 8 weeks after the end of treatment.



The results suggest that subsequent to the resilience training, there were statistically significant improvements in resilience and quality of life, and reductions in anxiety and perceived stress. Whilst Sood et al. (2011) adopted a robust research design, utilising an active control condition might have provided a sterner examination and ensured changes in measures were the result of the intervention rather than contact with others. Nevertheless, Sood et al. (2011) champion the fact that despite the intervention's brevity, results provide comparable outcomes for increased resilience and reduced anxiety symptoms, to published for studies adopting longer resilience training programs (e.g. Burton, Pakenham & Brown, 2010; Steinhardt & Dolbier, 2008; Waite & Richardson, 2004), including that of Schiraldi et al. (2010).

The results of these studies [2,4] suggest not only that resilience can be taught, but that by teaching people resilience, there is an associated reduction in anxiety and improvement in quality of life. Whilst improvements have been shown in resilience and anxiety post-intervention, regardless of length of training, neither study [2,4] included a follow up and therefore the long term benefits are unknown. Further research would therefore be useful to determine whether the effects of resilience training are continued beyond the end of the training.

### **1.5 Emotion Regulation and Resilience**

This section will first consider two theories of resilience, namely the Broaden and Build theory (Fredrickson, 1998; 2001) and the less well-known framework for resilience (Troy & Mauss, 2011) providing a short critique of each. This section will then consider whether the ability to regulate one's emotions (emotion regulation) contributes to the development of resilience, by reviewing the literature in this area.

### **1.5.1 The Broaden-and-Build Theory**

The Broaden-and-Build theory (Fredrickson, 1998, 2001) describes a process by which utilising positive emotions, such as joy, love and contentment, broadens a person's mindset and in turn builds an individual's physical, intellectual, social and psychological resources with enhanced resilience as an outcome. This development of resilience, or enhanced personal resources, serves to improve well-being and in turn creates opportunities for further positive experiences to be experienced, creating an 'upward spiral' effect as demonstrated in figure 6. Fredrickson (2004) notes that other theories of emotions outline that a person who experiences a negative emotion, such as fear, anger, disgust, have a narrowed mindset; that is that they have a reduced, specific set of behavioural options available to them. For example, a person experiencing fear has the desire to escape alongside a physiological response which mobilises the body for running. This narrowed behaviour is proposed to be evolutionarily adaptive in allowing for quick responses to life threatening situations. The Broaden and Build theory (Fredrickson, 1998, 2001) was created to address and explain the role of positive emotions, and address the theoretical bias towards the role of negative emotions that existed (Fredrickson & Levenson, 1998). Whilst the Broaden and Build theory highlights the role that positive emotions play, particularly in increasing the available behavioural responses and building on resilience, there is some lack of precision within the theory.

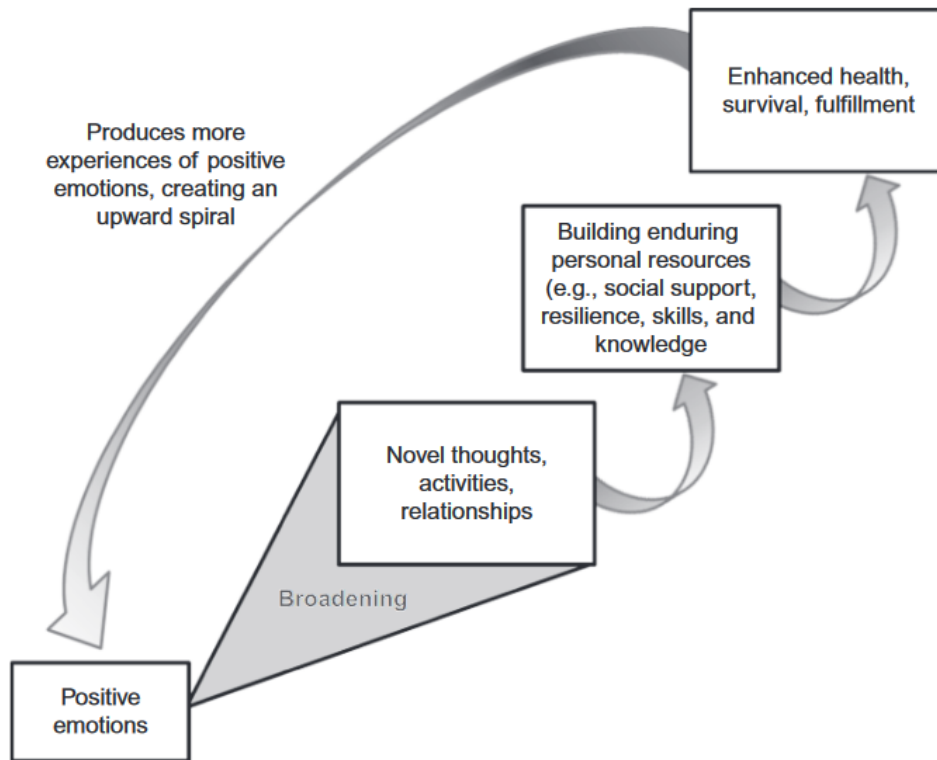


Figure 6. Diagram of the Broaden and Build theory (Fredrickson, 2013).

In contrast, Fredrickson (2004) postulates that positive emotions serve to widen one's repertoire of behaviour. Specific action-tendencies have been identified for positive emotions, however Fredrickson (1998) suggests that these are much too general. Positive emotions instead are identified as facilitating 'approach' behaviour, allowing a person to connect with their environment and fully participate in it, thereby serving an important function, both personally and societally. Fredrickson (2004) gives the following example "Joy, for instance, creates the urge to play, push the limits and be creative; urges evident not only in social and physical behavior, but also in intellectual and artistic behavior" (p. 1369). Similarly, play builds social connections with others which builds long lasting attachments; can build physical endurance; can build intellectual resources through creative thinking, and so on. This broadened mindset therefore has long term, adaptive benefits in building a person's

resources, that far outlast the experience of the emotion. Fredrickson, Mancuso, Branigan and Tugade (2000) also suggests that the experience of positive emotion is related to finding positive meaning, in that experiencing positive emotion broadens thinking, and therefore increases the likelihood of finding personal meaning. This then cumulates and builds on psychological resilience.

### **1.5.2 Critique of the Broaden-and-Build Theory**

The Broaden and build (BB) hypothesis has received attention from researchers. Early research by Fredrickson and Branigan (2005) used a sample of 104 college students and used two experimental procedures to test whether positive emotions broaden the scope of attention and thought-action repertoires. Participants reported their subjective feelings of emotions and were shown one of five film clips designed to elicit either a positive (amusement or contentment), negative (anger or anxiety) or neutral emotion. Participants were then asked to imagine a situation in which this particular emotion would arise. Breadth of attention was then assessed using a visual processing task, and breadth of momentary thought-action repertoires was assessed using an open-ended Twenty Statements Test (TST; Kuhn & McPartland, 1954).

The results demonstrated that those in the positive emotion film clip groups, showed a significantly larger global bias score, therefore supporting the hypothesis that positive emotions broaden the scope of attention. The contrasting hypothesis that negative emotions narrow attention however, was not supported. Similarly, the positive emotion groups showed larger thought-action repertoires, showing desire to play, be active, be social and fewer urges to rest/sleep, supporting their initial hypotheses. With regard to the hypothesis that negative emotions reduce thought-

action repertoires, there was only a marginal effect for the anger-eliciting film and the anxiety-provoking clip did not reach significance.

It may be that although the conducted manipulation checks of the films were found to elicit the desired emotion, given that the film clips are artificial in nature, positive emotions may have been more lasting and therefore impacted attention and thought-action repertoires. In contrast, the negative feelings may not have been as pervasive and therefore may not have carried over in to the experimental tasks. Fredrickson and Branigan (2005) suggest that it may also be that the global-local visual processing task used within the study, may have been insensitive to narrowing.

It is not only Fredrickson and colleagues who have considered the Broaden and Build theory of positive emotions. Nelson (2009) conducted two experimental studies, using 80 students, looking at positive affect and the ability to empathise with others, and appreciate alternative perspectives. Participants were assigned either to a positive or neutral condition, and were asked to write about a past experience where they experienced elation, joy and pride (positive condition), or their morning routine (neutral condition). Participants then read a vignette describing someone who had experienced distress in an interpersonal context, with half depicting similar cultural conditions to that of the participant, and the other half depicting dissimilar cultural conditions. They then answered questions about perceptions of similarity and empathic responding.

The results demonstrated that those in the positive condition showed a greater appreciation for unfamiliar views and greater compassion. These results were replicated in a second experiment which included a 'negative affect' group, and

therefore the authors conclude that the differences in flexibility and open-mindedness are not due to increased emotion in general, but specifically to positive emotions. Whilst this evidently supports the ‘broaden’ element of the theory, the authors suggest it also demonstrates the ‘build’ function of positive affect, whereby the enhanced empathy allowed for a ‘building’ of enduring social resources. Whilst supporting the BB theory, both Fredrickson and Branigan (2005) and Nelson (2009) used laboratory experimental designs and therefore they lack ecological validity.

A more recent study by Bono, Glomb, Shen, Kim and Koch (2013) considers the effect of positive emotions in a real life setting. Bono et al. (2013) conducted research to study the effects of a positive reflection task on stress. Sixty-one women took part in the research which lasted 3 weeks, and reported daily work events and stress, wore ambulatory blood pressure (BP) monitors for 2 hours in the morning, afternoon and evening, and answered questions about their current stress and health in an evening phone interview. At the end of each work day from study days 8 to 15, participants were reminded to perform a daily positive reflection exercise. The positive reflection exercise was based on research by Seligman et al (2005; 2006) and included recording three good things that had happened that day and explaining why they thought that these events had happened.

Analyses for the daily positive reflection task were conducted within-person and demonstrated that during the intervention period participants reported lower stress levels and fewer mental and physical health issues, however there was no difference in BP. The results provide support for the BB theory, asserting that positive events and emotions are not only associated with increased positive health and well-being, but also a reduced level of negative affect, such as reduced stress.

Bono et al. (2013) propose that this is due to the ‘broaden and build’ nature of positive emotions, and highlight the importance of increasing and acknowledging positive events. The research is limited by its all-female sample, and also by its confines to health care workers, however the methodology uses a number of ‘in the moment’ strategies and doesn’t solely rely on rigid self-report questionnaires which reduces the effects of common method variance.

Research has also considered not just the behavioural and social aspects of the BB theory, but also the neurological and brain changes that might lend further support to the model. In a review of the evidence, Garland, Fredrickson, Kring, Johnson, Meyer and Penn (2010) looked at advances in neuroscience regarding emotions and integrated this with the BB theory of positive emotions. They consider the advances in affective neuroscience that show that there is some malleability in the plasticity of the brain in response to a person’s experience (Turlejski & Djavadian, 2002). Garland et al. (2010) suggest that this parallels the tenet of the BB theory which proposes that repeated positive emotions create an upward spiral of well-being. They write “recurrent practice of novel responses and repeated experiences that ‘stretch’ one beyond his or her previously established limits are associated with the development of potentiated synaptic connections and new neural growth” (Garland et al., 2010, p. 7). In addition, Schmitz, De Rosa and Anderson (2009) used magnetic resonance imaging (MRI) scans and induced positive, negative or neutral states in participants, before showing them a face in the centre of interleaved blocks. They found that positive states broaden, and negative states narrow one’s field of view and responses to novel stimuli, consistent with the BB theory.

The BB theory of positive emotions has accumulated good empirical support. Resilience, within the BB model, is a set of resources that are acquired and developed through the experience and utilization of positive emotions. Whilst the BB model appears to be compatible with the idea of resilience training, it would seem to suggest that it is the ongoing utilization of positive emotions in everyday life that broaden and build resilience. Thus resilience does not appear to be a static resource, moreover it is something that can continually be built on and developed. Given that older adults have had a greater amount of time to cultivate resilience through more opportunities to encounter positive emotions, it would be expected that given the upward spiral, older people would have significantly greater levels of resilience than younger people. Gooding et al. (2012) however, finds that resilience is associated with emotion regulation ability and problem solving in older adults, but with social support in young adults, therefore there appears to be a qualitative difference in resilience when comparing under 26 year olds and over 64 year olds. In addition, the model seems to list resilience alongside social support, skills and knowledge (see figure 6) however, research suggests that these components create and build resilience (e.g. Gooding et al., 2012; Fontes & Neri, 2015).

In addition, the BB model does not seem to acknowledge the role of innate personal characteristics and how they contribute to the model, and seems to suggest that all people will utilise positive emotions in a way that allows growth and development of resilience and enduring personal resources (figure 6). Fontes and Neri (2015) conducted a review of psychological resilience in aging, and say that "...resilience involves a complex interaction between the individual and his or her dispositional resources and environmental supports" (p.1486) and that there are aspects of an individual, including "...capacity for emotional regulation, can explain

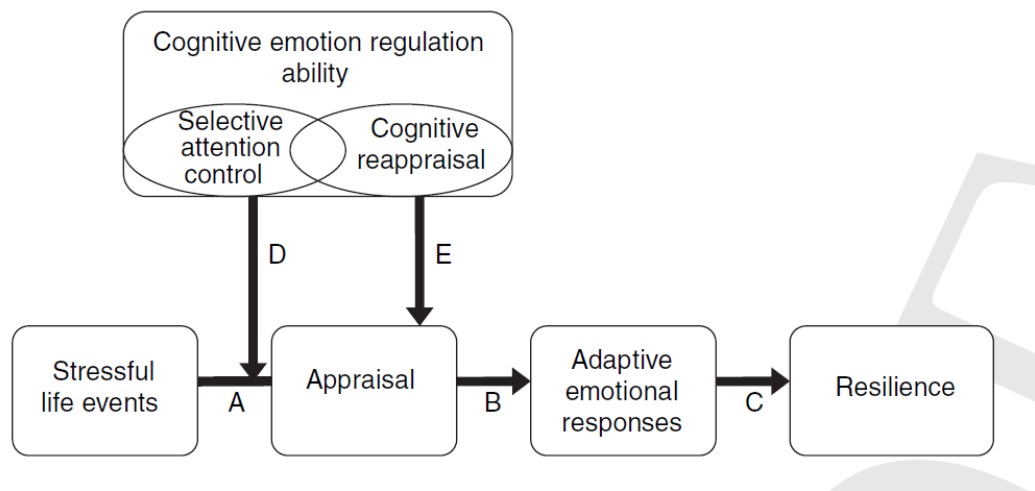


differences in levels of resilience between individuals” (p. 1486-1487). In addition, research considering personality characteristics and resilience has evidenced an association (Friborg et al., 2005; Campbell-Sills et al., 2006) unaccounted for by the BB model.

Therefore, whilst the BB model receives some empirical support, there appear to be components that are not included, that might add to the model. A new framework by Troy and Mauss (2011), which considers both emotion regulation and resilience, will be discussed below.

### **1.5.3 A Framework of Resilience**

Troy and Mauss (2011) propose a framework for resilience that considers cognitive-emotion regulation as a moderator of resilience in the face of daily stressors in the general population (see figure 7). The stressful life events referred to within the Troy and Mauss (2011) model, are common life events such as job loss, illness as well as more minor stressors such as familial disagreements, however to maintain specificity they do not include traumatic events, and so the scope of the model is a broad one.



*Figure 7. Cognitive emotion regulation as a moderator between stressful life events and resilience (Troy & Mauss, 2011, p.31).*

This framework hypothesises that resilience is impacted by cognitive emotion regulation ability and adaptive emotional responses. Troy and Mauss (2001) suggest that stressful events may precede resilience, given that stressful life events tend to evoke large amounts of emotion (Lazarus, 1999) and therefore emotion regulation strategies provide an important means of managing, expressing and regulating that emotion, creating resilience as a result. It is hypothesized that individuals who are effectively able to manage and regulate their emotions are expected to demonstrate greater resilience in response to a daily stressor. Therefore in contrast to the BB model which posits that positive emotions alone promote resilience, the framework of resilience postulated by Troy and Mauss (2011) suggests that through the need and use of cognitive emotion regulation strategies, it is stressful life events that are implicated in the development of resilience.

The model of resilience (Troy & Mauss, 2011) finds theoretical support at each level (see Troy & Mauss, 2011 for a full review) particularly when considering the evidence for cognitive reappraisal and selective attention. The model has its

origins in appraisal theories which propose that it is the individual's subjective evaluation of an event, that is responsible for the emotional reaction elicited. It is suggested that cognitive emotion regulation, which refers to a person's ability to manage and regulate emotions through attentional control or reappraisal, will impact the interpretation of a situation and consequently bring about emotional change (Ochsner & Gross, 2005). As the illustration demonstrates (figure 1.6), this then contributes to resilience and resilient outcomes through decreased negative emotional response. Given that the framework of resilience is a relatively new model, it has not received the research attention that the BB model (Fredrickson, 1998; 2001) has. The following literature review (section 1.5.5) will consider the relationship between emotion regulation and resilience, to determine whether emotion regulation promotes resilience.

#### **1.5.4 Summary of the Models**

The framework for resilience (Troy & Mauss, 2011) shares similarities with the Broaden and Build (BB) model (Fredrickson, 1998; 2001) in that both consider the importance of emotions contributing to resilience. However, where the BB theory focuses specifically on the role of positive emotions in broadening a person's mindset and leading to the building of enduring resources (resilience), Troy and Mauss's model (2011) postulates the role of stressful life events, given the requirement of emotion regulation strategies to manage the results affect, as contributing to resilience. The BB model (Fredrickson, 1998; 2001) was developed at the height of the positive psychology wave, and as a result has gathered good empirical backing in comparison to the framework of resilience proposed by Troy and Mauss (2011) which remains in its infancy without much direct empirical support. As previously highlighted however, there remain components of the BB

model that appear to be missing (e.g. innate personal characteristics) and individual differences in the experience and utilization of positive emotions are unaccounted for.

### **1.5.5 Literature Review of Resilience and Emotion Regulation**

For the purpose of this research, a literature review was conducted in PsycARTICLES, PsycINFO and MEDLINE on in March 2016 looking at whether there is an association between resilience and emotion regulation, and particularly whether adaptive emotion regulation skills promote or build resilience. The search was set to only include peer-reviewed journal articles printed after 2010. The key search terms used are as follows:

1. Resilien\*
2. Emotion Regulation
3. Emotion Dysregulation
4. 2 OR 3
5. 1 AND 4

The initial search yielded 404 studies which underwent a pre-selection process whereby titles and abstracts were screened for relevance based on the inclusion criteria outlined above however, as a result only 2 papers were eligible for inclusion. The search parameters were widened to look at the association by using the search terms resilien\* and emotion. The search was set to only include peer-reviewed journal articles printed after 2010. This returned 317 papers, 34 of which were duplicates and therefore removed. Studies were included if they: a) used a sample of

adults, and b) looked at the relationship between positive emotions, emotional intelligence or emotion regulation and resilience.

Studies were rejected if they included a measure of trauma or used a sample group that by definition could have experienced trauma e.g. military personnel. Case reports, dissertations, conference presentations, and unpublished observations were excluded from the study in order to ensure the quality and comparability of studies involved in the current literature review. In addition, research using animal subjects was excluded, as well as studies that focused on neuro-biochemical aspects of emotion or resilience. Furthermore, research that focused on aspects of health adjustment or trauma were excluded, on the basis that these are not typical experiences and may skew results. Limitations were set on language (English). The final 14 articles were screened for eligibility (figure 1.7) with 8 studies included in the current review. Details of these can be found in table 1.3.

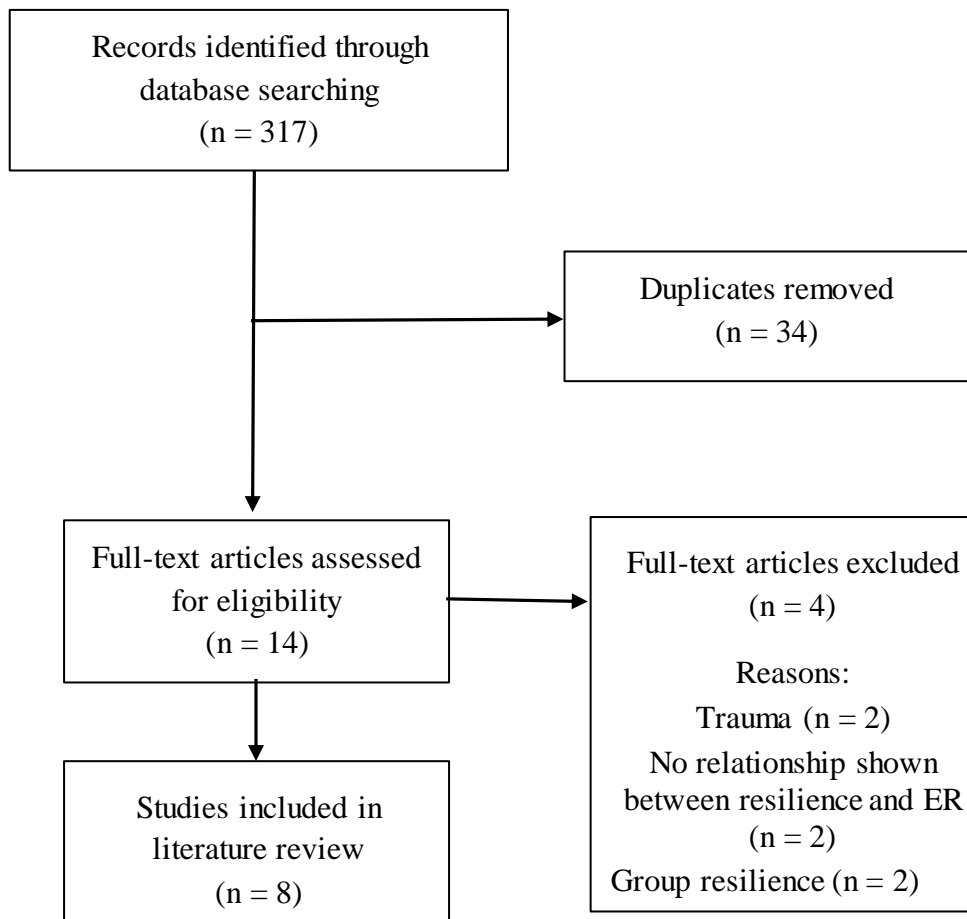


Figure 8. Summary of Search Procedure

Table 1.3.

*Research considering the relationship between resilience and emotion regulation.*

	Author(s)	Design	Sample characteristics	Measures	Results
1)	Ong, Zautra & Reid (2010)	Daily process design	Patients with a chronic pain diagnosis in a primary care practice in NYC  (n=95)	The Ego Resiliency Scale, the Mini-IPIP  Daily diary - 7 items re: pain catastrophizing; average pain intensity (0 – 10); positive and negative emotions (24 items) rated on 5 point Likert scale	Resilient individuals rebound from daily pain catastrophizing through experiences of positive emotion
2)	Armstrong, Galligan & Critchley (2011)	Cross-sectional, between participants	Members from online discussion groups.  n=414  3 groups: vulnerable, average and resilient (determined by distress score percentiles)	SUEIT-44; DASS-21; SRRS	Resilience determined by how distressed reported to be about life events. Those classed as resilient had significantly higher EI scores than the other groups (vulnerable and average)

3)	Karreman & Vingerhoets (2012)	Cross-sectional	Visitors to Dutch radio program website  n=632	Attachment Styles Questionnaire; ERQ; RS-nl; WHO-Five well-being index	Being more resilient and reframing situations as less emotional were significantly correlated.
4)	Min, Yu, Lee & Chae (2013)	Cross-sectional	Clinical (meeting DSM-IV criteria for anxiety and depression)  n=230	Korean versions of: CERQ, CD-RISC, BDI, STAI	Adaptive emotion regulation strategies associated with resilience
5)	Schneider, Lyons & Khazon (2013)	Cross-sectional, Repeated measures design	University students  n=126  Random assignment	MSCEIT V2.0; stress appraisals; PANAS; cardiograph; blood pressure monitor	Ability-based EI facilitates stress resilience (promotes resilient psychological and physiological responses)
6)	Hou & Ng (2014)	Cross-sectional	University students  n=284	Chinese versions of: RS, RPA-EF, RAS, STAI-S	Emotion-focused positive rumination mediated the inverse association between trait resilience and anxiety symptoms
7)	Loh, Schutte & Thorsteinsson (2014)	Cross-sectional, repeated measures design	University students  n=107	CES-D; PANAS; PSS; RS	Higher positive affect and higher resilience were associated with



less depression symptomology

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8)	Seaton & Beaumont (2015)	Experiment (Time 1 and Time 2)	University students  n=129  Random assignment	ER89; PANAS; PSA; QEWB	Positive emotion at T1 was related to ego-resilience. Suggests positive emotions might contribute to eudaimonic well-being by building ego-resilience
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*Note.* RS = Resiliency Scale (Siu et al., 2009); RPA-EF = Responses to Positive Affect Questionnaire – Emotion Focus subscale (Feldman et al., 2008); RAS = Relationship Assessment Scale (Hendrick, 1988; Li & Fung, 2013); STAI-S = State Trait Anxiety Inventory – state version (Shek, 1988); ATQ = Adult Temperament Questionnaire – Short Form (Evans & Rothbart, 2007); ERQ = Emotion Regulation Questionnaire (Gross & John, 2003); LEQ = Life Events Questionnaire (Coddington, 1973); CES-D = Centre for Epidemiological Studies – Depression Scale (Radloff, 1977); PANAS = Positive and Negative Affect Scale (Watson et al., 1988); PSS = Perceived Stress Scale (Cohen et al., 1983); RS = Resilience Scale (Wagnild & Young, 1993); WLEIS = Wong & Law Emotional Intelligence Scale (Wong & Law, 2002); BRS = Brief Resilience Scale (Smith et al., 2008); EE = Emotional Exhaustion Scale (Kreitner & Kinicki, 1992); TI = Turnover Intention Scale (Fournier et al., 2010); ER89 = Ego-resilience scale (Block & Kremen, 1996); PSA = Personal Strivings Assessment (Emmons, 1999); QEWB = Questionnaire for Eudaimonic well-being (Waterman et al., 2010)

### **1.5.6 Review of the literature**

The majority of the research included in this literature review utilises a cross-sectional design [2,3,4,6], with two studies [5,7] using a repeated measures design, one study using an experimental design [8] and one study using a daily process design [1]. The cross-sectional research provides useful information about whether two variables of interest are correlated however, it is unable to provide information regarding causality. The use of repeated measures and an experimental design however is beneficial in allowing causal inferences to be made. Sample sizes vary included in the literature varied from 95 [1] to 632 [3] and participants were recruited from universities [5,6,7,8], health care clinics [1,4] and from the general population utilising online methods of recruitment [2,3].

Most of the research reviewed used standardised self-report measures to assess resilience and emotion regulation [2,3,4,6,7,8], with the exception of Schneider et al. (2013) [5] who utilised an ability-based measure (MSCEIT v2.0) to assess emotional intelligence and Ong et al. (2010) [1] who utilised diaries to capture emotion regulation abilities. Ability-based measures have the benefit of being less reliant on a person's recollection or perception of the construct in question, instead they look to a person's measureable abilities in an area. Day and Carroll (2004) looked at the construct and criterion-related validity of the MSCEIT ability based measure of emotion intelligence (EI), and found that the four factor model of EI (Mayer, Salovey & Caruso, 2000) that the measure was based on, fit the data well. In addition, the MSCEIT shows only weak correlations with the NEO-PI (Costa & McCrae, 1992) supporting good construct validity. Day and Carroll (2004) however found the criterion-related validity of the MSCEIT measure was weak.

A mixture of measures were used to quantify resilience including the RS [3,6,7], ego-resiliency scale [1], CERQ [4] and the ER89 [8]. Two of the studies did not utilise standardised measures, with 1 classifying participants in to a resilient group if they had a weak or non-significant relationship between life events and distress [2], and another used stress responses and appraisals [5]. The use of standardised measures ensures the reliability and validity of the research however is restricted to the participant's perceptions of their own resilience. Two studies however, did not utilise self-report, instead using measures of alternative constructs (e.g. life events and distress [2] and stress appraisals [5]) to infer resilience. This means of determining resilience has benefits in not relying on participant perceptions, and therefore is not as susceptible to human error or deception. Despite this, it is difficult to determine whether the methods assumed to determine resilience, are actually measuring resilience as the underlying construct. Similarly, the measurement of emotions, emotion regulation and emotional intelligence all utilised different measures, reducing the comparability of the research.

### **1.5.7 Is Emotion Regulation associated with Resilience?**

Due to the wide search criteria, the research has been separated in to a discussion of the literature in 3 sections; research studying positive emotions in general [1,7,8], emotion regulation [3,4,6] and emotional intelligence [2,5].

#### **1.5.7.1 Positive Emotions and Resilience**

The reviewed studies provide evidence suggesting a correlation between positive emotions and greater resilience [1,7,8], while mediation analyses have found these linked to a number of other outcomes such as well-being [8], lower depression [7], and lower reports of pain [1]. These results provide some support for the Broaden and Build theory of positive emotions (Fredrickson, 1998; 2001),

namely that positive emotions are related to, and predict, resilience. The reviewed literature has not directly researched the BB model, however these studies contribute to the growing literature in support of this model.

The literature is also finding evidence that the effects of positive emotions can have long term effects. Seaton & Beaumont (2015) [8] conducted research looking at the role of positive emotion and resilience on personal goal striving and well-being. Participants completed a battery of measures before watching a video designed to either induce positive emotions (amusement or awe) or a neutral video which acted as a control. Four weeks later, participants completed further measures. The research demonstrated that self-reported positive emotions, as determined by the PANAS, were predictive of increased resilience (ER89), and resilience partially mediated a relationship between positive emotions and well-being (QEWB). Given the four week gap between the completion of measures, there may have been a number of confounding variables that may have affected subsequent mood, resilience and well-being, beyond the experimental manipulation.

These findings are also supported research by Cohn, Fredrickson, Brown, Mikels and Conway (2009) who found that positive emotions predict an increase in both resilience and life satisfaction. They found that positive emotions mediate the relationship between baseline resilience and resilience a month later, although life satisfaction was not found to mediate this relationship. The authors conclude that it is specifically ‘in the moment’ positive emotions that build and contribute to resilience, rather than a general positive outlook or evaluation of one’s life.

#### **1.5.7.2 Emotion Regulation, Emotional Intelligence and Resilience**

The reviewed literature demonstrates a relationship between resilience and emotion regulation (ER) strategies [3,4,6] and emotional intelligence (EI) [2,5]. Two

studies [4,5] looked not only at emotion regulation and emotional intelligence as a whole, but also at its constituent parts. Min et al. (2013) [4] utilised the CERQ to measure emotion regulation and demonstrated that refocusing on planning and positive reappraisal, both adaptive strategies, showed the strongest correlations with resilience, whereas blaming others did not have a significant relationship with resilience at all. Similarly, Schneider et al. (2013) looked at four EI abilities and found that high emotional perception, emotional understanding and emotional management were related to resilience however facilitating cognitions were not correlated. Therefore, it appears that some components of ER and EI are related to resilience, but not all.

Research also considered regression analysis to consider which factors best predicted an outcome. Armstrong et al. (2011) [2] found that emotional self-awareness and emotion expression are predictive of resilience. Resilience in their research [2] was determined by classifying participants into three classes; vulnerable, average and resilient, with the resilient group being determined by participants with a non-significant or weak relationship between life events and distress. In addition, Min et al. (2013) utilised regression analyses and found that refocusing on planning and positive reappraisal, as well as lower levels of rumination, were predictive of high resilience. Conversely, research [6] has also found that trait resilience significantly predicts emotion focused positive rumination. Thus it appears that further longitudinal or experimental research is required to further unpick this relationship. Despite this, research utilising regression and mediational analyses highlights a predictive relationship between emotion regulation and emotional intelligence, and resilience.

This research provides some support for the framework for resilience proposed by Troy & Mauss (2011) whereby emotion regulation abilities moderate the relationship between stressful life events and resilience. As discussed however, the research furthers the application of this model, by also highlighting the role of emotion regulation strategies and resilience within anxiety and mood disorders (e.g. Min et al., 2013).

### **1.5.8 Summary**

The literature suggests that positive emotions can be used as a means of building resilience and adds to the empirical support of the BB theory of positive emotion. This review also considers emotion regulation and resilience, and finds support for emotion regulation strategies being predictive of resilience [4] as well as resilience predicting aspects of emotion regulation, such as emotion focused positive rumination [6]. Given previous discussion regarding the difficulties in defining the concept of emotion regulation and resilience, the research in this area is less conclusive. Whilst there is good evidence to suggest that there is a relationship between emotion regulation abilities and resilience, it is also apparent that this is not so with all emotion regulation strategies. Some appear to be more effective in promoting resilience than others [4]. Indeed, research by Troy, Shallcross and Mauss (2013) suggests that how adaptive and useful an emotion regulation strategy is, is dependent on the moment and context in which it's used. For example, the authors found that when a situation is uncontrollable, cognitive reappraisal is an adaptive and effective strategy. For stressful situations that can be controlled and adapted however, cognitive reappraisal is less adaptive. This may help explain why the results regarding specific strategies are less conclusive and research in this area yields varying results.

## **1.6 Internet Mediated Research (IMR)**

Internet mediated research (IMR) is gaining momentum and traction as a means of recruitment among researchers and affords benefits in being economic, safe and quick (Walker, 2013). However, there has been skepticism from researchers, journals and editors about its validity (Gosling, Vazire, Srivastava & John, 2004). This section aims to briefly review literature pertaining to the use of IMR.

### **1.6.1 Internet Recruitment**

When recruiting research participants via the internet, the sample is limited to those with access to a computer however, the internet continues to grow in popularity and the Office for National Statistics (ONS, 2010) found that 60% of adults in the UK accessed the internet daily. This suggests that internet based research could have the potential to be reached by the majority of the UK population.

Gosling et al. (2004) compared traditional samples to those obtained online. The results showed that compared to traditional methods, online samples allow access to a larger number of male participants, however there remains a bias towards white participants compared to non-white participants. Gosling et al. (2004) also found recruitment was skewed towards a younger population however, given that many traditional methods of recruitment use student-based populations, the mean age is comparable to face-to-face recruitment.

### **1.6.2 Ethical Considerations in IMR**

Gaining consent for online research can be effectively managed by requesting participants read the information provided and answer questions to indicate they have read the information. Completing the questionnaires in this way indicates

consent to participate as this is without external pressure or opportunity for coercion (Walker, 2013).

The avoidance of face-to-face contact between the researcher and participant also means that anonymity can be afforded in a way that is not always possible with traditional data collection methods (Meho, 2006). This can be particularly useful if the topic is of a sensitive nature or if the group being sampled would find face to face contact difficult. This anonymity however, can also pose a problem, as the researcher is not able to follow up on any information provided (Enyon et al., 2008) such as high hopelessness scores.

### **1.6.3 Research Reliability and Validity**

The lack of researcher control has been often cited as a disadvantage of IMR (Hewson, 2003) however, it is important to acknowledge however, that this shares similar limitations with postal surveys (Kraut, Olson, Banaji, Bruckman, Cohen & Couper, 2004) and telephone surveys (Hewson, 2003). However, IMR does help to remove experimenter bias as well as human error that can occur when recording or dictating data, as information collected can be downloaded directly on to a database (Birnbaum, 2004). Research has also shown that respondents completing questionnaires online may respond with greater openness (Joinson, 1999; Reitz & Wahl, 2002) and questionnaires appear to transfer easily from the paper format in which they were originally designed, to an online version (Whitehead, 2011). A further difficulty can be that those who read the information but choose not to participate are not known, therefore any differences respondents and non-respondents cannot be assessed.



#### **1.6.4 Summary**

With regard to the current research, IMR was chosen due to its access to a broad demographic (Hewson, 2003) and the ability to yield a good number of respondents (Whitehead, 2011). In addition, there are economic and practical benefits associated with IMR. With regard to the population of the current study, research has demonstrated that a number of people who display GAD symptoms, might not contact health services and may experience a delay in diagnosis (Kessler et al., 2001). Therefore, an internet survey aimed at the general population is expected to identify a larger sample of people with GAD symptoms. In addition, the use of IMR is hoped to enable participation who may be anxious to participate as they can answer anonymously, on their own, without need for a researcher to be present.

#### **1.7 The Present Study**

The current research looks at the role of resilience in the emotion dysregulation model of GAD. While research has demonstrated the role of resilience in anxiety, the relationship between emotion regulation and resilience is less well understood. As such, the current study examines whether the relationship between emotion regulation and GAD is mediated by resilience. Moreover, this study seeks to contribute to the increasing literature base demonstrating emotion dysregulation as a predictor of GAD by using alternative measures to those used within Mennin et al. (2005).

##### **1.7.1 Hypotheses of the Current Study**

The first three hypotheses test related issues. They have been separated however, into three separate hypotheses in order to clearly define the relationships between each of the three variables, and to allow easy comparability to previous research. The main hypotheses are as follows.

Research (e.g. Mennin et al., 2005) has investigated differences in the ability to regulate emotions between those with GAD and those without. The first hypothesis considers this relationship within the current study.

1) It is hypothesized that there will be a statistically significant difference between the high GAD symptoms group and the low GAD symptoms group in emotion regulation.

Previous research has looked at the relationship between anxiety and resilience, however little research has considered the role of resilience in GAD. The second hypothesis seeks to determine this relationship.

2) It is hypothesized that higher levels of GAD, as determined by the GAD-7, will significantly correlate with lower levels of resilience, as measured by the CD-RISC.

The third hypothesis is similar to the first in considering differences in the ability to regulate emotion in individuals with GAD, however specifically focuses on whether this relationship resembles a correlation, to further elucidate the type of relationship as well as ensure the suitability of regression analyses.

3) It is hypothesized that higher levels of GAD, as determined by the GAD-7, will significantly correlate with higher levels of emotion dysregulation, as measured by the DERS and CERQ.

Research by Mennin et al. (2005) found that emotion dysregulation, as measured by a composite of four measures, predicted GAD symptoms. This research

therefore aims to determine whether this predictive relationship is found using different, and more contemporary, measures of emotion regulation.

- 4) It is hypothesized that emotion dysregulation will be a predictor of GAD symptoms.

Finally, the research aimed to investigate a new area by bringing together research demonstrating links between each of the variables, GAD, emotion regulation and resilience, to determine whether there was an overall mediating relationship.

- 5) It is hypothesized that resilience will mediate the relationship between emotion dysregulation and GAD.

## **CHAPTER TWO**

### **2. Study Population & Methodology**

#### **2.1 Chapter Overview**

This chapter describes the research design, the sample, the measures chosen and the procedure utilised. Any ethical concerns are highlighted and the plan of analysis is briefly described.

#### **2.2 Design**

This research employed a cross-sectional research design to consider the role of emotion dysregulation and resilience in GAD. An independent group comparison was used to elucidate differences in emotion dysregulation and resilience in a group of adults with GAD symptoms compared to those without. In addition, mediation and regression analyses were used to predict how emotion dysregulation and resilience impact GAD symptoms.

#### **2.3 Study population**

Participants were recruited using the internet from a non-clinical population. The recruitment strategy was designed to attain a representative and diverse sample of the general population.

##### **2.3.1 Determination of sample size**

In order to determine the sample size necessary for the research to be sufficiently powered, a statistical power analysis was conducted using G\*Power (Faul, Erdfelder, Buchner & Lang, 2009) based upon Analysis of Variance (ANOVA). Previous research detected moderate effect sizes (e.g. Mennin et al., 2005), with a similar design to that adopted in the current study. However, with the

addition of the additional variable resilience, the expected effect size was moderated to 0.25 (small effect) to be conservative and ensure the statistical analyses retain sufficient power. From this, a sample size of 74 was required to compare group differences.

Regression analyses were also used to consider the mediating effect of resilience on GAD. Previous research has not investigated emotion dysregulation, resilience and GAD in this way and therefore the rough guide of  $n = 50 + 8k$  (Green, 1991) was used, necessitating a sample size of 82, to ensure sufficient power. This was calculated using four independent variables (IVs): DERS, CERQ, CD-RISC, and CESD.

### **2.3.2 Inclusion Criteria**

Adults must be aged 18 years or over. All participants must be fluent in English and all participants must have access to a computer.

### **2.3.3 Exclusion Criteria**

Participants with current alcohol or drug dependency, and any participant with a diagnosis, or suspected diagnosis, of a developmental disorder such as Autism were excluded from taking part in the research. This was due to related difficulties in regulating emotions, that may confound the current research results. As the main research is exploratory, and given the use of an opportunistic sampling method, no further restrictions were placed on other anxiety disorders.

Participants were informed of inclusion and exclusion criteria at the start of the research on the information sheet and informed that they were unable to take part if they have these difficulties. Participants were also asked specific questions relating to eligibility on the demographic questionnaire. Those who did not match

the inclusion and exclusion criteria, but whom had participated were then removed at the analysis phase.

#### **2.3.4 Recruitment**

The sample size was initially decided upon after calculations for power were completed, and appropriate methods of recruitment considered. The primary method of recruitment was through online websites. In order to ensure a good sample of participants with GAD symptoms and without GAD symptoms, self-help groups and forums for anxiety were contacted, as well as more general websites such as the BBC. The anxiety specific websites contacted in the current study were found by entering the following search terms in a Google search engine: anxiety self-help, anxiety group, anxiety forums. Based on the search results the author visited the identified websites to determine suitability.

The creators/moderators of these online groups and websites were contacted to request permission to post a link to the research on their web page. Those that agreed to the request were sent the link to the research and it was hosted on their website allowing access to those visiting their website. This was either done by the group moderator/creator or by the researcher, depending on their preference. In order to gain a wider sample that also included ‘non-anxious’ participants, a link was also posted on social media sites, including Facebook and Twitter. The researcher posted a link to the research study on social media pages and asked contacts to ‘repost’ the research link on their pages to advertise to a wider audience.

The use of the internet as a means of collecting data is being increasingly used by researchers (e.g. Edmunds & Buchanan, 2012). Internet mediated research (IMR: BPS, 2013) allows for a large amount of data to be collected in a timely way and at a low cost (Hewson, 2003). For this study, internet recruitment and data collection

were chosen over more traditional means in order to gain a large and diverse sample of participants to form a representative sample. Using the internet to facilitate recruitment for this research removes the need for face-to-face contact, and participants are able to discontinue at any point anonymously. Given this, it is expected to out-perform traditional methods by eliminating some of the interpersonal stressors and factors that may otherwise put off someone with high levels of anxiety from taking part.

The study was designed and created using Survey Monkey ‘Gold package’ ([www.surveymonkey.com](http://www.surveymonkey.com)). This software was used as it simplifies the process of creating the study, it provides a secure encrypted storage facility for the data, and is easy for participants to use. The research design however was limited by the existing parameters and requirements of ‘Survey Monkey’. The information page, consent form, questionnaires and debrief information were then embedded, and a ‘percentage completed’ tool used to indicate to participants how many questionnaires were left.

### **2.3.5 Participants**

A total of 278 participants enrolled in the current study (see figure 9). Four participants did not meet eligibility criteria, as reflected in their answers to questions on the demographic questionnaire, but continued to participate, and therefore were removed at the analysis stage. Eighty-seven participants started the questionnaire but missed out one or more, full questionnaires and therefore were also excluded from the analysis. This was to ensure that participants who may have withdrawn their consent to participate in the research by ‘exiting’ out of the internet page, were not included in the overall analysis. A total of 187 participants were included in the final analysis. Participants were either recruited from specific anxiety forums, social

media or through friends sharing the link with their friends, using what would be termed a snowball effect (see Noy, 2008). A flow diagram detailing from where participants were recruited is shown in figure 9.

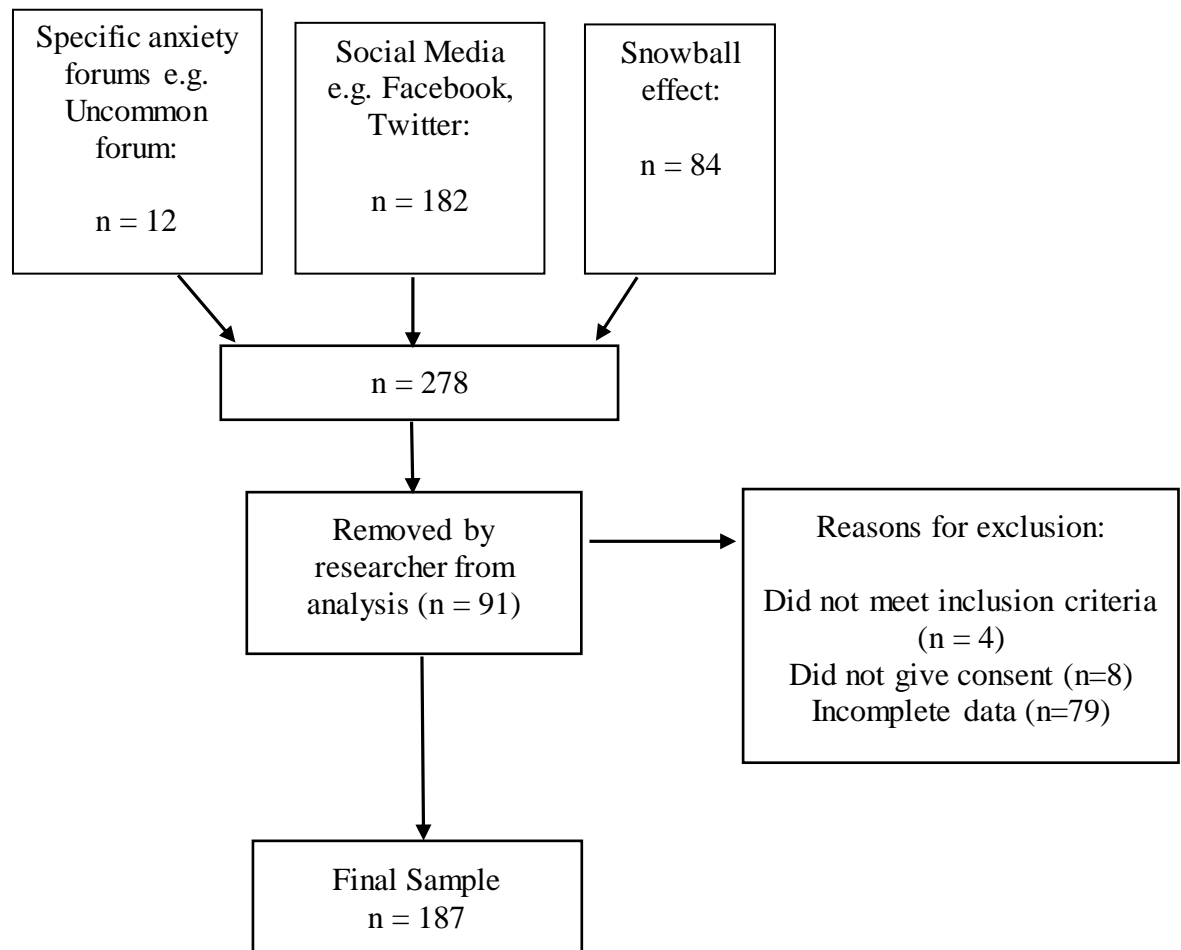


Figure 9. Flow diagram describing participant recruitment.

## 2.4 Measures

In keeping with the study design, all six measures used to test the independent and dependent variables are self-report questionnaires were digitized for ease of completion. The psychometric properties and a description of the measures used in the current study are presented below and copies (where permitted) are attached in the appendices.



### **2.4.1 Demographic Information**

In total twelve questions assessed a range of demographic and family background variables including religious affiliation, life satisfaction and educational status. Questions specifically related to the eligibility criteria were also included to ensure suitability for the research study.

### **2.4.2 Generalised Anxiety Disorder measures**

Generalised Anxiety Disorder (GAD) formed the basis of the independent variable and was used to allocate participants to one of the two groups. Participants complete the Generalised Anxiety Disorder-7 (GAD-7) questionnaire which identifies those with GAD symptomology and those without. For the purpose of testing hypothesis one, those scoring 10 or above become the high GAD symptoms group and those scoring nine or below become the low GAD symptoms group.

#### **2.4.2.1 Generalised Anxiety Disorder - 7 item (GAD-7).**

The GAD-7 (Appendix A) is a 7 item self-report measure of GAD symptomology (Spitzer, Kroenke, Williams & Lowe, 2006). The scale has seven items which are rated on a four point Likert scale (0 = not at all; 1 = several days; 2 = more than half the days; 3 = nearly every day). The GAD-7 was designed to reflect the symptom criteria for GAD in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). The GAD-7 however, is not a diagnostic tool, but rather a tool indicating evidence of GAD symptoms in line with diagnostic criteria. The GAD-7 is based on ratings of symptoms over the previous 2 weeks and therefore can be used to assess change over time.

The GAD-7 demonstrates adequate internal consistency ( $\alpha = .92$ ) and a good test-retest reliability (intraclass correlation = 0.83) (Spitzer et al., 2006). It has good convergent validity, with a correlation of .72 with the Beck Anxiety Inventory (BAI:

Beck, Epstein, Brown & Steer, 1988), and of .74 with the anxiety subscale of the Symptom Checklist-90 (SCL-90-R; Derogatis, 1983; Derogatis & Savitz, 2000). The suggested cut-off for determining moderate to severe GAD is 10, with greater scores indicating a greater number of GAD symptoms (Spitzer et al., 2006; Swinson, 2006). Using this cut-off, the GAD-7 has a sensitivity of 89% and a specificity of 82% (Spitzer et al., 2006). The GAD-7 has been shown to have good psychometric properties in both a clinical and general population sample (Lowe et al., 2008).

### **2.4.3 Measures of Psychological Distress**

Measures of depression and worry were included within the research as covariate variables. Participants were required to complete the Centre of Epidemiological Study Depression Scale (CES-D) and the Penn State Worry Questionnaire (PSWQ).

#### **2.4.3.1 Centre of Epidemiological Study Depression Scale (CES-D).**

The CES-D (Appendix B) was developed by Radloff (1977) for use in epidemiological studies of depression, and therefore in the general population. It is a self-report measure of current depressive symptoms and includes 20 items reflecting six major dimensions of depression. The measure is quick to complete and is easily understandable by lay people (Radloff (1977)).

The CES-D was developed by combining items from previously validated depression scales and items included statements such as “My sleep was restless” and “I felt that everything I did was an effort”. Respondents were asked to rate the frequency of each symptom in the last week, on a Likert type scale ranging from 0 = ‘rarely or none of the time (Less than 1 day)’ to 3 = ‘most or all of the time (5-7 days)’. Overall scores on this measure could therefore range from 0, indicating no depressive symptomology to 60 indicating high depressive symptomology.

Using a cut-off score of 16, identifies individuals with depression symptoms reaching a clinical threshold with a sensitivity of .95 and a specificity of .29 (Radloff, 1977). This scale has shown high internal consistency ranging from  $\alpha = .85$  in the general population to  $\alpha = .90$  in a clinical population (Radloff, 1977). Test-retest correlations were in the moderate range, generally between .45 and .70, however the test-retest was confounded by the different methods of data collection used and the different time intervals used between each testing. The CES-D has also been found to have good concurrent validity, with a correlation of .84 with the SCL-90-R (Derogatis, 1983).

#### **2.4.3.2 Penn State Worry Questionnaire (PSWQ).**

The PSWQ (Appendix C) was designed by Meyer, Miller, Metzger and Borkovec (1990) to measure an individual's tendency to worry excessively and consists of 16 self-report items. Participants are required to rate each item on a five-point Likert scale ranging from 1 = 'not at all typical of me' to 5 = 'very typical of me' with higher scores indicative of higher levels of worry. Items include statements such as "my worries overwhelm me" and "when I am under pressure I worry a lot" and some items were reversed to reduce the 'effects of acquiescence' such as "I do not tend to worry about things".

Meyer et al. (1990) demonstrated the PSWQ has good internal consistency using both a non-clinic sample ( $\alpha = .76$ ) and a clinical sample ( $\alpha = .74$ ). It has been shown to have good test-retest reliability ( $r = .92$ ) and convergent and discriminant validity (Meyer et al., 1990). The PSWQ has also been shown to identify individuals with GAD from a general population sample as well as distinguishing between different anxiety disorders (Brown, Antony & Barlow, 1992; Fresco, Mennin, Heimberg & Turk, 2003).

#### **2.4.4 Resilience measure**

A measure of resilience was used to determine resilient characteristics to allow comparison between those with GAD symptomology and those without, as well as investigating it as a mediator variable using mediation analyses.

##### **2.4.4.1 Connor-Davidson Resilience Scale (CD-RISC).**

The CD-RISC was devised by Connor and Davidson (2003) to measure stress coping ability. The scale is a self-report measure and comprises 25 items, such as “Can deal with whatever comes” and “I like challenges”. Participants are required to indicate how true each statement is of them, basing this on the past month. Ratings are made on a five-point Likert-type scale ranging from 0 = ‘not true at all’ through 2 = ‘sometimes true’ to 4 = ‘true nearly all the time’. Scores range from 0 to 100 with higher scores representing greater resilience. There are no validated ‘cut off’ scores for the measure.

The CD-RISC has been used in both clinical and non-clinical samples. It has excellent internal consistency ( $\alpha = .89$ ), with a test-retest reliability of .87 (Connor & Davidson, 2003). The CD-RISC showed good convergent validity with the Perceived Stress Scale (PSS-10; Cohen, Kamarck, Mermelstein, 1983) with a correlation of .76. No difference in mean scores by gender was observed and there was no correlation found between age and the CD-RISC score. The original validation data tested the CD-RISC on a group of patients with GAD and found a mean score of 62.4.

## **2.4.5 Emotion Regulation measures**

### **2.4.5.1 The Difficulties in Emotion Regulation Scale (DERS).**

The DERS (Appendix D) was created by Gratz and Roemer (2004) and developed as a means of comprehensively assessing emotion dysregulation. The DERS is a 36-item measure that reflects four dimensions of emotion regulation, such as awareness and understanding of emotions, acceptance of emotions, the ability to engage in goal-directed behaviour and access to emotion regulation strategies perceived as effective. Items are rated on a five-point Likert type scale ranging from 1 (almost never) to 5 (almost always) with total scores ranging from 36 – 180.

The DERS is shown to have good reliability ( $\alpha = .93$ ) and good internal consistency on each of the subscales ( $\alpha = >.80$ ) (Gratz & Roemer, 2004). Ritschel, Tone, Schoemann and Lim (2015) conducted research to test the psychometric properties of the DERS in different demographic groups. The DERS showed excellent internal consistency across racial background ( $\alpha = .93$  to  $\alpha = .94$ ), and across gender ( $\alpha = .93$  to  $\alpha = .94$ ).

### **2.4.5.2 The Cognitive Emotion Regulation Questionnaire (CERQ).**

The CERQ (Appendix E) was created by Garnefski, Kraaij and Spinhoven (2001; Garnefski, Kraaij & Spinhoven, 2002) to specifically address the cognitive components of emotion regulation. The CERQ is a 36 item questionnaire that reflects nine distinct subscales including self-blame, other-blame, rumination, catastrophizing, putting into perspective, positive refocusing, positive reappraisal, acceptance and planning. Items are rated on a five-point Likert scale ranging from 1 (almost never) to 5 (almost always) with scores ranging from 36 to 180. There is no overall total score calculable for the CERQ, instead scores for each of the nine subscales are used.

The measure shows good reliability in an adult population with the majority of the scales reaching  $\alpha = .80$  (Garnefski & Kraaij, 2007). The subscales have been shown to have good internal consistencies ranging from .68 to .86 (Garnefski, Legerstee, Kraaij, van den Kommer & Teerds, 2002).

## **2.5 Ethical Considerations**

The study was designed in accordance with the British Psychological Society Code of Ethics and Conduct (2009) and the British Psychological Society (BPS) Ethics Guidelines for Internet-mediated Research (2013). The research was granted ethical approval by the FMH Research Ethics Committee in July 2014 (Appendix F).

### **2.5.1 Consent and Coercion**

Participants were able to access the research through the link provided on websites. Participants were required to read the information sheet (Appendix G) prior to completing the study questionnaires and the researcher's contact details were provided for any potential participants who required more information. Participants were informed that taking part was voluntary and that they could withdraw their consent at any point, up to two weeks after participation, without giving a reason. Participants were then required to read through a series of statements pertaining to consent and indicate their understanding and agreement using the 'yes' or 'no' buttons. If participants answered 'no' to any of the questions, this indicated non-consent and they were not able to continue. If participant's indicated 'yes' to all questions, this indicated their informed consent to take part. At the end of the research, participants were able to read a debrief sheet informing them further about the research study (Appendix H).

### **2.5.2 Confidentiality**

To ensure confidentiality, participants were not required to put their names or any identifying information on the questionnaires; instead participants were required to create a unique Personal Identification Code (PIC) to enable later identification in the event participants wish to withdraw. Participants were asked to create their unique PIC code using the first and last digits of their date of birth, the first and last letters of their mother's maiden name, and the first and last letters of the road or street on which they live. For example, if a participant's date of birth is 25<sup>th</sup> November 1964, their mother's maiden name is Smith and they live on St. Margaret's Street, their PIC would be: 24SHST.

Participants were invited to provide their email address if they wanted to be included in the prize draw or would like information about the results of the study. These contact details were stored in a separate database to the questionnaire responses to ensure confidentiality and were destroyed once winners of the prize draw were notified, and the research results sent out. The data are stored in line with Data Protection Act (1998) and not shared with any external agencies.

### **2.5.3 Right to Withdraw**

All participants were informed that they have a right to withdraw at any point during the research without giving a reason. Participants were able to exit the study at any point to indicate withdrawal of their consent. The unique PIC created by the participant enables those who want to later withdraw, up until two weeks later, to do so. If participants withdraw consent, their data are destroyed.

### **2.5.4 Procedures in Case of Distress**

Once the questionnaires were completed, all participants were forwarded to a debriefing page which thanked them for their time and gives contact details for appropriate outside agencies should they feel distressed in any way. This included

contact details for organisations such as the Samaritans and the NHS website.

Participants were also advised to contact their Doctor or other healthcare provider should they feel distressed.

## **2.6 Plan of Statistical Analysis**

The raw data from the questionnaires were directly imported from Survey Monkey into the Statistical Packages for Social Sciences (SPSS) for Windows version 22. Missing data were dealt with according to protocol (see section 3.2.1). The data were initially screened in order to check for normality. Details on the assumption testing for the data are provided in section 3.2.3. Using the cut off score of 10 on the GAD-7 (Spitzer et al., 2006), high GAD symptoms and low GAD symptoms groups were created. To address the research questions, the following statistical analyses were performed.

Analysis of Variance (ANOVA) statistics were conducted to establish any differences in resilience and emotion regulation (Hypothesis 1). Where possible, parametric bivariate correlation statistics were conducted (Hypothesis 2 and 3) in the form of Pearson's correlation coefficient, however where violations of assumptions existed, non-parametric correlation analyses were used (Hypothesis 3) using ranked data (Spearman's rho). Multiple linear regression analyses were used to determine whether emotion dysregulation is a predictor of GAD symptoms (Hypothesis 4) and finally mediation analyses were conducted to determine whether resilience mediates the relationship between emotion dysregulation and GAD symptoms. The analyses for hypotheses 4 and 5 were also repeated using the PSWQ, with a cut-off score of 45 (Behar, Alcaine, Zuellig & Borkovec, 2003) denoting those with GAD symptoms



and those without. A diagram of the proposed mediation model is shown in Figure 10.

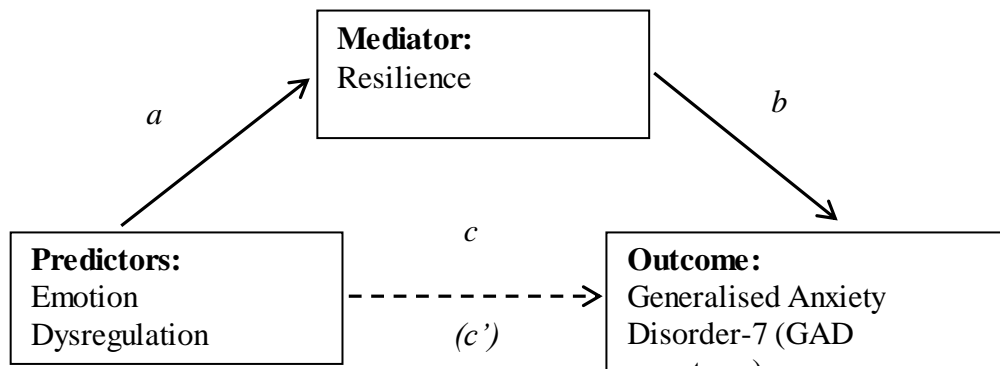


Figure 10. Diagram of proposed mediation model

## **CHAPTER THREE**

### **3. Results**

#### **3.1 Chapter Overview**

This chapter presents the results of the statistical analyses conducted on the data collected. An initial exploration of the data, including testing to determine whether statistical assumptions are met with regard to parametric characteristics of the data, is conducted prior to hypothesis testing. Descriptive data for measures used, and the statistical outcomes of each of the research hypotheses are fully described. Finally, a summary of the main findings is presented.

#### **3.2 Exploration of Data**

All data were checked for missing data, outliers and to check assumptions of normality (kurtosis and skewness) to determine whether assumptions for parametric statistics are met.

##### **3.2.1 Missing data**

Prior to commencing statistical analyses to address the research questions, the dataset was screened for missing data. Data that was missing at random and accounted for less than 10 per cent were replaced by individual mean substitution ( $n = 52$ ) (Tabachnick & Fidell, 2007). Research by Shrive et al. (2006) investigating different methods of dealing with missing data, found that if missing data equaled less than 30%, individual mean substitution was an appropriate imputation method. Given the online nature of the research, participants were able to withdraw from the questionnaires at any time by exiting the survey. Therefore, missing data that was not random but occurring at the latter end of the questionnaires, totaling greater than

10% of responses, was considered to indicate a withdrawal of consent, and therefore these participants were removed from the analysis.

A total of 278 participants initially entered the study, however 91 participants were excluded from the final analysis for the following reasons; they did not meet inclusion criteria (n=4), failed to provide informed consent (n=8) or failed to provide complete data, as defined by more than 10% of responses being missing (n=79). Data from the remaining 187 participants were used in the final analyses. The flowchart depicting this has previously been shown in figure 2.1 (section 2.3.5).

### **3.2.2 Outliers**

Box plots were produced and inspected for outliers prior to analysis. A number of outliers were detected. One outlier was found in the CERQ reframing subscale and CD-RISC, two outliers were found in the PSWQ, three outliers were found in the GAD-7, four outliers in the DERS clarity subscale, five outliers were found in the CERQ catastrophizing subscale, eight outliers were found in the DERS impulse subscale and eleven outliers were found in the CERQ blaming subscale. This was resolved using Winsorising (Tukey 1962) whereby the outliers were replaced with one unit higher than the next value within the distribution not suspected to be an outlier. In this way, the data is captured within the analysis, but prevents it from erroneously impacting the results (Field, 2009).

### **3.2.3 Testing of Assumptions**

The Levene statistic was utilised to test homogeneity of variance, and was not violated within the current analyses. Histograms, normal quantile-quantile plots and the Shapiro-Wilk test of normality were used to determine the distribution of the data. Details of the skewness, kurtosis and Shapiro-Wilk values can be found in

table 3.1. The significance of the skewness and kurtosis statistics were determined  
by converting them to z-scores.

Table 3.1

*Normality Characteristics of the Data*

Measure	N	M (SD)	Skewness (SE)	Kurtosis (SE)	Shapiro- Wilk
GAD-7	187	12.87 (4.22)	.87 (.18)***	.26 (.36)	.93***
CD-RISC	186	51.58 (13.62)	-.00 (.18)	-.22 (.36)	.99
<b>CERQ</b>					
Self Blame	187	10.39 (3.43)	.67 (.18)***	.17 (.36)	.96***
Acceptance	187	12.00 (3.30)	.13 (.18)	-.64 (.36)	.98**
Rumination	187	11.76 (3.79)	.32 (.18)	-.60 (.36)	.97***
Reframing	187	9.85 (3.77)	.45 (.18)*	-.46 (.36)	.96***
Planning	187	12.45 (3.84)	.03 (.18)	-.75 (.36)*	.98**
Reappraisal	187	12.00 (4.07)	.16 (.18)	-.76 (.36)*	.97***
Perspective	187	12.68 (3.66)	-.06 (.18)	-.51 (.36)	.98**
Catastrophising	187	7.54 (3.05)	.92 (.18)***	.21 (.36)	.90***
Blaming	187	7.37 (2.37)	.58 (.18)**	.15 (.36)	.92***
<b>DERS</b>					
Total	186	84.42 (23.98)	.58 (.18)**	-.41 (.36)**	.95***
Non-	186	14.34 (6.33)	.51 (.18)**	-.73 (.36)*	.94***
Acceptance	186	14.57 (4.45)	.39 (.18)*	-.45 (.36)	.97***
Goals	186	12.02 (4.79)	1.12 (.18)***	.96 (.36)**	.90***
Impulse	186	15.38 (4.61)	.26 (.18)	-.51 (.36)	.98*
Awareness	186	17.36 (7.42)	.84 (.18)***	-.16 (.36)	.91***
Strategies	186	10.54 (3.62)	.88 (.18)***	-.67 (.36)	.93***
<b>Clarity</b>					
CESD	187	37.42 (6.92)	.58 (.18)**	.36 (.36)	.94***
PSWQ	187	42.50 (9.02)	.49 (.18)**	-.27 (.36)	.97***

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

The Shapiro Wilk test found that the majority of the outcome measures (GAD-7, DERS, CERQ, CESD and PSWQ) were statistically significantly deviated from a normal distribution. The CD-RISC however was found to resemble a normal distribution. Given the large sample size ( $n=187$ ), the Shapiro Wilk statistic can detect even small deviations from normality however, it does not determine whether this deviation is enough to bias the use of parametric statistics (Field, 2009). Therefore, the histograms were inspected alongside skewness and kurtosis statistics to determine the extent of the non-normality. As can be observed in appendix I, the majority of the histograms appeared to approximate a normal distribution (GAD-7, CD-RISC, CERQ self-blame, CERQ acceptance, CERQ rumination, CERQ reframing, CERQ planning, CERQ reappraisal, CERQ perspective, DERS total, DERS goals, DERS awareness, DERS strategies, DERS clarity, CESD and PSWQ). On inspection, the histograms for the remaining measures (CERQ catastrophizing, CERQ blaming, DERS non-acceptance and DERS impulse) were more skewed and therefore less consistent with normality. Schmider, Ziegler, Danay, Beyer and Bühner (2010) however, state that the ANOVA is robust against violations of normality and can be used, giving the same outcome, for different types of distribution. In addition, the research uses a large sample size and therefore parametric statistics were used throughout, given the associated superior power efficiency (Vickers, 2005).

### **3.2.4 Demographic Information**

The sample consisted mainly of females (87 %), with 58% of all participants aged between 26 and 40 years old. The majority of the sample were White British

(91.8%), which whilst highly skewed is typical of research in this area. Participants either identified themselves as Christian (55%) or of no religion (36.5%). Table 3.2 outlines a summary of the demographic data for the sample used in the current research.

Table 3.2.

*Demographic data for the sample (n = 187)*

	Categories	N
Gender (n = 186)	Male	24 (13%)
	Female	162 (87%)
Age (n = 187)	18-21	5 (2.7%)
	22-25	25 (13.4%)
	26-30	60 (32.1%)
	31-40	48 (25.7%)
	41-50	27 (14.4%)
	51-60	13 (7%)
	61-70	7 (3.7%)
Marital Status (n = 183)	Single, never married	58 (31.7%)
	Co-habiting	37 (20.2%)
	Married	78 (42.6%)
	Separated/Divorced	10 (5.5%)
Educational Status (n = 179)	Pre- GCSEs	1 (0.6%)
	GCSEs/O-levels	13 (7.3%)
	NVQ	4 (2.2%)

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	AS level	1 (0.6%)
	A level	15 (8.4%)
	Diploma	13 (7.3%)
	Undergraduate	75 (41.9%)
	Masters degree	37 (20.7%)
	Doctoral	18 (10.1%)
	Post-doctoral	2 (1.1%)
Country of Origin (n = 187)	United Kingdom	164 (87.8%)
	Other Europe	11 (5.9%)
	North America	3 (1.6%)
	South America	1 (0.5%)
	Australia	4 (2.1%)
	Africa	3 (1.6%)
	South Africa	1 (0.5%)
Ethnicity (n = 184)	White British	166 (90.2%)
	Irish	1 (0.6%)
	Pakistani	1 (0.5%)
	Chinese	1 (0.5%)
	African	1 (0.5%)
	Caribbean	1 (0.5%)
	Any other ethnic group	13 (7.2%)
Religion (n = 187)	None	68 (36.5%)
	Christian	103 (55%)
	Catholic	13 (7%)

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Muslim	1 (0.5%)
Atheist	1 (0.5%)
Coptic Orthodox	1 (0.5%)

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### 3.2.5 Preliminary Analyses

The GAD-7 was used to group participants into two groups, with those scoring 10 or higher comprising the high GAD symptoms group (n = 37) and scores below 10 comprising a low GAD symptoms group (n = 150). Separate non-directional Chi Square statistics were conducted to determine if any significant group differences existed between the high GAD ( $GAD-7 \geq 10$ ) and low GAD ( $GAD-7 < 10$ ) participants at baseline. When expected frequencies were below 5, Fisher's Exact statistic was used. There were no significant difference between the high GAD and low GAD groups in terms of gender ( $\chi^2 = .45$ ), religious affiliation ( $\chi^2 = 1.68$ ), education status ( $\chi^2 = .16$ ), age ( $\chi^2 = 1.80$ ) or ethnicity ( $\chi^2 = .44$ ). There was a statistically significant difference found in terms of marital status ( $\chi^2 = 5.06$ ). The results are illustrated in table 3.3.



Table 3.3.

*Chi-square table illustrating differences in demographic variables between the high GAD symptoms group (GAD-7  $\geq$  10) and the low GAD symptoms group (GAD-7 < 10).*

	GAD-7 <10 (n)	GAD-7 $\geq$ 10 (n)	$\chi^2$	P value
<u>Gender (n=186)</u>				
Male	18	6	.45	p = .58
Female	131	31		
<u>Religion (n=185)</u>				
No religious affiliation	51	17	1.68	p = .25
Identification with a religion	97	20		
<u>Education (n=179)</u>				
Up to Higher Education	28	6	.16	p = .82
Higher Education	115	30		
<u>Marital Status (n=183)</u>				
Currently married	69	9	5.06	p < .05
Not currently married	79	26		
<u>Age (n=187)</u>				
50 and under	130	35	1.80	p = .26
51 and over	20	2		
<u>Ethnicity (n=181)</u>				
White British	132	34	.44	p = .74
Other	13	2		

ANOVA was used to determine differences between the high GAD (GAD-7  $\geq$  10) and low GAD (GAD-7 < 10) symptoms groups in terms of depression symptoms (CESD scores) and worry (PSWQ scores). As expected, the high GAD group scored significantly higher than the low GAD group on the PSWQ,  $F_{(1, 185)} = 46.76, p < .001$ , and the CESD,  $F_{(1, 185)} = 52.02, p < .001$ .

Table 3.4

*ANOVA to determine significant differences between participants in the high GAD symptoms group (GAD-7  $\geq$  10) and the low GAD symptoms group (GAD-7 < 10) on measures of depression (CESD) and worry (PSWQ).*

	GAD7 <10	GAD7 $\geq$ 10	<i>F</i>	<i>p</i>
	M (SD)	M (SD)		
CESD	35.82 (6.11)	43.93 (6.20)	52.02	p < .001
PSWQ	40.57 (8.06)	50.97 (9.18)	46.76	p < .001

*Note.* CESD = Centre for Epidemiological Studies Depression Scale; PSWQ = Penn State Worry Questionnaire.

### 3.3 Hypothesis Testing

**3.3.1 Hypothesis one. There will be a statistically significant difference between the high GAD symptoms group and the low GAD symptoms group in emotion regulation (DERS and CERQ) and resilience (CD-RISC) scores.**

**3.3.1.1 Emotion Regulation.** ANOVA was used to compare means of difficulties in emotion regulation, as measured by the total score on the DERS questionnaire, between participants in the high GAD symptoms group (GAD-7 scores  $\geq$  10) and the low GAD symptoms group (GAD-7 scores < 10). The results showed a significant difference between participants in the two groups on the DERS, a measure of emotion dysregulation (see table 3.5).

A one-way ANOVA was conducted for each of the six subscales in the DERS questionnaire to determine specific differences between the high GAD symptoms and low GAD symptoms groups. The six subscales are as follows: difficulty engaging in goal-directed behaviour (Goals), non-acceptance of emotional responses (Non-Acceptance), lack of emotional awareness (Awareness), limited access to emotion regulation strategies (Strategies), lack of emotional clarity (Clarity) and impulse control difficulties (Impulse). As six calculations were conducted, a Bonferroni corrected significance level ( $p < .008$ ) was used. When there are multiple comparisons, the risk of a type I error (false positive) increases and therefore the alpha value is adjusted to take account of this, however consequently increases the risk of a type II error (false negative). In deciding whether to apply a Bonferroni correction to the data, the relative strengths and limitations were considered in line with the research question and the data. In the approach to the data within this research, a conservative approach has been adopted.

The results showed a statistically significant difference between groups for Goals ( $F_{(1, 184)} = 20.19, p < .001$ ), Non-acceptance ( $F_{(1, 185)} = 34.56, p < .001$ ), Impulse ( $F_{(1, 185)} = 30.03, p < .001$ ), Strategies ( $F_{(1, 185)} = 64.64, p < .001$ ) and Clarity ( $F_{(1, 185)} = 24.09, p < .001$ ). The high GAD symptoms group had mean scores in each of these subscales that was significantly higher than the low GAD symptoms group. The Awareness subscale of the DERS however, did not indicate a statistically significant difference ( $F_{(1, 185)} = .90, p = .34$ ), between participants in the high GAD symptoms and participants in the low GAD symptoms group. Details of the findings can be found in table 3.5.

Table 3.5

*ANOVA of emotion regulation (DERS) subscales in the high GAD symptoms group (GAD-7  $\geq$  10) compared to those in the low GAD symptoms (GAD-7 < 10) group.*

DERS	GAD-7 <10 M (SD)	GAD-7 $\geq$ 10 M (SD)	F	p
Total	78.85 (20.99)	106.72 (22.21)	51.15	p < .001
Goals	13.87 (4.17)	17.37 (4.51)	20.19	p < .001
Awareness	15.23 (4.54)	16.02 (4.83)	.90	p = .34
Strategies	15.48 (6.24)	24.92 (7.00)	64.64	p < .001
Clarity	9.99 (3.16)	13.19 (4.85)	24.09	p < .001
Non-acceptance	13.07 (5.64)	19.35 (6.52)	34.56	p < .001
Impulse	11.20 (4.21)	15.87 (6.12)	30.03	p < .001

Given that the CERQ does not have a total score calculable, a one-way ANOVA was conducted for each of the nine factors of the CERQ to determine differences in cognitive emotion regulation strategies between those in the high GAD symptoms group and those in the low GAD symptoms group. The nine subscales contain five theoretically more adaptive cognitive strategies (Garnefski & Kraaij, 2007): acceptance, positive reappraisal, refocusing on planning, positive refocusing and putting in to perspective; and four less adaptive strategies: self-blame, rumination, catastrophizing and blaming others. As nine calculations were conducted, Bonferroni corrections ( $p < .006$ ) were used to minimise the chance of obtaining a Type I error.

The results showed that participants in the high GAD symptoms group reported statistically significantly higher mean scores for self-blame ( $F_{(1, 185)} = 24.55, p < .001$ ) and rumination ( $F_{(1, 185)} = 31.66, p < .001$ ). Participants in the high GAD symptoms group were also statistically significantly less likely to use positive reframing ( $F_{(1, 185)} = 12.14, p < .001$ ), refocusing on planning ( $F_{(1, 185)} = 12.02, p < .001$ ), positive reappraisal ( $F_{(1, 185)} = 16.56, p < .001$ ) and catastrophizing ( $F_{(1, 185)} = 32.32, p < .001$ ). There was no statistically significant difference between participants in the high and low GAD symptoms groups in terms of acceptance ( $F_{(1, 185)} = 1.60, p = .20$ ), putting things in to perspective ( $F_{(1, 185)} = 4.81, p = .03$ ) or blaming others ( $F_{(1, 185)} = 5.28, p = .02$ ).

Table 3.6

*ANOVA of emotion regulation (CERQ) strategy use in the GAD symptoms group ( $GAD-7 \geq 10$ ) compared to those in the low GAD symptoms ( $GAD-7 < 10$ ) group.*

CERQ	GAD-7 <10 M (SD)	GAD-7 $\geq$ 10 M (SD)	F	p
Self-blame	9.81 (3.03)	12.75 (3.95)	24.55	p < .001
Rumination	11.11 (3.36)	14.73 (4.05)	31.66	p < .001
Positive reframing	10.33 (3.73)	7.99 (3.37)	12.14	p < .001
Refocus on planning	12.92 (3.70)	10.54 (3.87)	12.02	p < .001
Positive reappraisal	12.58 (4.05)	9.66 (3.26)	16.56	p < .001
Perspective	12.97 (3.59)	11.51 (3.80)	4.81	p < .05
Acceptance	11.85 (3.29)	12.61 (3.31)	1.60	p = .21
Catastrophizing	6.99 (2.60)	9.97 (3.75)	32.32	p < .001
Blaming	7.28 (2.29)	8.41 (3.89)	5.29	p < .05

**3.3.1.2 Resilience.** An analysis of variance (ANOVA) statistic was used to compare means in the resilience measure (CD-RISC scores) in the high GAD symptoms group (GAD-7 scores  $\geq 10$ ) and the low GAD symptoms group (GAD-7 scores  $< 10$ ). Descriptive statistics revealed that the low GAD symptoms group had a mean CD-RISC score of 52.71 (SD = 13.28) and the high GAD symptoms group had a mean score of 47.05 (SD=14.59). There was a statistically significant difference between participants in these two groups,  $F_{(1, 185)} = 5.07, p < .05$ .

**3.3.1.3 Summary of Hypothesis one.** The results demonstrate that participants within the high GAD symptoms group (GAD7  $\geq 10$ ) have significantly higher emotion dysregulation scores (DERS, CERQ) and lower CD-RISC scores (CD-RISC) than participants in the low GAD symptoms group (GAD7  $< 10$ ), thus defeating the null hypothesis.

Detailed analysis using the subscales of the emotion regulation measures, reveals that specifically, those in the high GAD symptoms group have higher scores for self-blame (CERQ), rumination (CERQ), and catastrophizing (CERQ) as well as show more difficulty engaging in goal-directed behaviour (DERS), being less accepting of their emotional responses (DERS), lacking emotional awareness (DERS), having limited access to emotion regulation strategies (DERS), lacking emotion clarity (DERS) and having impulse control difficulties (DERS). Similarly, those in the high GAD symptoms groups were less likely to positively reframe situations (CERQ), refocus on planning (CERQ), reappraise the information in a positive way (CERQ) or put things into perspective (CERQ). There was no significant difference between participants in the two groups in terms of acceptance (CERQ), blaming (CERQ) or awareness (DERS). Overall, those with high GAD

symptoms show significantly higher emotion dysregulation (DERS and CERQ) than those in the low GAD group.

**3.3.2 Hypothesis two. Higher levels of GAD, as determined by the GAD-7, will significantly correlate with lower levels of resilience, as measured by the CD-RISC.**

A scatterplot graph of the two variables was visually inspected to determine linearity, and deemed fairly linear despite wide scatter. Given that both the GAD-7 and CD-RISC were approximately normally distributed, a parametric bivariate correlation was used. A one-tailed test was used, given that the hypothesis states the direction of the proposed relationship. The results demonstrate a statistically significant negative correlation ( $r = -.21, p < .001$ ) between GAD-7 scores and CD-RISC scores, and the null hypothesis was rejected. Cohen (1988) states that a 'small' effect size is .1, a medium effect size is .3 and those of .5 are considered large effect size. The effect size of the correlation between GAD and resilience is small ( $r = .21$ ) and explains only 4.4% of the variance.

**3.3.2.1 Summary of Hypothesis two.** The results demonstrate that whilst GAD symptoms (GAD-7) are correlated with resilience (CD-RISC), it has a small effect size and only explains 4.4% of the variance. Therefore, whilst statistically significant, a large amount of variance in GAD-7 scores remains unexplained by resilience scores.

**3.3.3 Hypothesis three. Higher levels of GAD, as determined by the GAD-7, will significantly correlate with higher levels of emotion dysregulation, as measured by the DERS and CERQ.**

Scatterplot graphs of the two variables (GAD and DERS) were visually inspected to determine linearity. Given the data appeared fairly linear, a parametric bivariate correlation was used to determine the relationship. Pearson's correlation coefficient was conducted, using a one-tailed test due to the hypothesis stating the direction of the proposed relationship. The results support the hypothesis with a significant positive correlation ( $r = .59, p < .001$ ) between GAD-7 questionnaire scores (GAD symptoms) and total DERS scores (emotion dysregulation). As such, the null hypothesis is rejected. Using Cohen (1988) estimation of effect size, the correlation between GAD and emotion dysregulation has a large effect size ( $r = .59$ ) and explains 34.8% of the variance.

Given that some of the subscales of the DERS and CERQ violated the assumption of normality, two further correlation analyses were conducted using Spearman's rho correlation coefficients to determine the relationship between GAD (GAD-7) and specific components of emotion dysregulation. The analysis investigated the six subscales of the DERS, and the nine subscales of the CERQ. It is expected that this will further elucidate the relationship between GAD and emotion dysregulation.

The DERS consists of six subscales or factors: 1) non acceptance of emotional responses (non-acceptance), 2) difficulties engaging in goal-directed behaviour (goals), 3) impulse control difficulties (impulse), 4) lack of emotional awareness (awareness), 5) limited access to emotion regulation strategies (strategies) and 6) lack of emotional clarity (Gratz & Roemer, 2004). As six correlations were conducted, Bonferroni corrections ( $p < .008$ ) were used to minimise the chance of obtaining a Type I error. Five of the DERS subscales were found to statistically significantly and positively correlate with GAD-7 scores (Table 3.7), however lack



of emotional awareness did not reach statistical significance ( $r = .15, p = .02$ ). The effect sizes of the subscales ranged between moderate (lack of emotional clarity, difficulties engaging in goal-directed behaviours, and impulse control difficulties) and large (non-acceptance of emotional responses and lack of access to emotion regulation strategies), using Cohen’s determinant of effect size (Cohen, 1988).

Table 3.7

*Bivariate Correlation Coefficients (Spearman’s rho) between GAD-7 scores and DERS subscales, measuring emotion dysregulation.*

DERS	Non-acceptance	Goals	Impulse	Awareness	Strategies	Clarity
GAD-7	.52**	.33**	.44**	.15	.60**	.33**

*Note.* \* $p < .008$  (Bonferroni corrected level), \*\* $p < .001$ .

The CERQ is a 36-item questionnaire of cognitive emotion regulation, creating nine subscales: 1) self blame, 2) acceptance, 3) focus on thoughts/rumination, 4) positive reframing, 5) refocus on planning, 6) positive reappraisal, 7) putting in to perspective, 8) catastrophizing, and 9) blaming others. As nine correlations were conducted, a Bonferroni correction was applied at  $p < .006$ . Significant positive correlations were found between GAD-7 and self blame, focus on thoughts/rumination, and catastrophizing (Table 3.8). Significant negative correlations were found between GAD-7 and positive reframing, refocus on planning, positive reappraisal and putting in to perspective. Acceptance and blaming others were not found to be significantly correlated with GAD-7.

Table 3.8

*Bivariate Correlation Coefficients (Spearman's rho) between GAD-7 scores and CERQ subscales, measuring emotion regulation.*

CERQ	SE-BL	ACC	RUM	RE-FR	PLAN	RE-A	PERS	CAT	BLA
GAD7	.37**	-.05	.39**	-.30**	-.34**	-.40**	-.29**	.39**	.09

*Note.* GAD7 = Generalised Anxiety Disorder 7 item scale; SE-BL = Self Blame; ACC = Acceptance; RUM = Rumination; RE-FR = Reframing; PLAN = Planning; RE-A = Reappraisal; PERS = Perspective; CAT = Catastrophizing; BLA = Blaming  
\* $p < .006$  (Bonferroni corrected level). \*\* $p < .001$ .

**3.3.3.1 Summary of Hypothesis three.** The results found a large positive significant correlation between emotion dysregulation and GAD, with a large effect size. Further investigation using the subscales of the DERS and CERQ, suggests that there are specific aspects of emotion regulation that hold a greater association with GAD-7 scores than others. As such, participants with higher GAD scores are statistically significantly more likely to be less accepting of their emotional responses, have difficulties engaging in goal-directed behaviour, have impulse control difficulties, have limited access to emotion regulation strategies and lack of emotional clarity, as measured by the DERS. In addition, participants with higher GAD scores are significantly more likely to use maladaptive emotion regulation strategies such as self-blaming, rumination and catastrophizing, and less likely to use adaptive strategies such as positive reframing, positive reappraisal, refocus on planning and taking another perspective, as measured by the CERQ.

**3.3.4 Hypothesis four. Emotion Dysregulation, as measured by the DERS, will be a significant predictor of GAD symptoms (GAD-7).**

A simple linear regression was calculated with GAD-7 scores as the dependent variable and the total DERS score as the predictor variable. A significant regression equation was found ( $F_{(1, 185)} = 97.28, p < .001$ ), with an adjusted  $R^2$  of .34. The

results therefore support the hypothesis that emotion dysregulation is a significant predictor of generalized anxiety symptoms.

A stepwise multiple linear regression analysis was conducted, using the Enter method, to identify the emotion regulation strategies that predicted GAD scores on the GAD-7. Continuous variables that correlated with GAD symptoms (GAD-7) in univariate analyses ( $p < .01$ ) were also entered as potential predictors in the following regression analyses, including the CESD and CD-RISC. Subscales of the DERS and CERQ were only entered if they significantly correlated with the GAD-7. Marital status was also entered given the statistically significant difference found between those with high GAD symptoms, compared to those with low GAD symptoms (see section 3.2.5). The PSWQ, although significantly correlated with the GAD-7, was not entered as in itself it can be used as a predictor of GAD symptoms and therefore would be likely to overpower all other predictors.

Different entry methods of variables were considered given that Field (2009) suggests that past research should be considered to inform future analysis however, there has been much variation in methods of analysis. Given the discrepancy in methods of regression, a stepwise method was chosen to take advantage of random sampling variation. The final regression model (see Table 3.9) included CES-D, strategies (DERS), reappraisal (CERQ) and rumination (CERQ) as the best predictors of GAD-7 scores ( $F_{(4, 180)} = 50.67, p < .001$ ) with an adjusted  $R^2$  of .52.

Table 3.9

*Regression table with emotion dysregulation, CESD and CD-RISC as predictor variables, and GAD-7 as outcome variable.*

	B	SE B	$\beta$	Sig.
<b>Model 1</b>				
Total CESD	.40	.03	.65	$p < .001$
<b>Model 2</b>				
Total CESD	.28	.04	.43	$p < .001$
Strategies (DERS)	.20	.04	.37	$p < .001$
<b>Model 3</b>				
Total CESD	.28	.04	.44	$p < .001$
Strategies (DERS)	.16	.04	.30	$p < .001$
Reappraisal (CERQ)	-.14	.06	-.13	$p < .05$
<b>Model 4</b>				
Total CESD	.25	.04	.40	$p < .001$
Strategies (DERS)	.14	.04	.24	$p < .001$
Reappraisal (CERQ)	-.16	.06	-.16	$p < .01$
Rumination (CERQ)	.15	.07	.13	$p < .05$

**3.3.4.1 Summary of Hypothesis four.** A multiple linear regression identified CESD scores, limited access to emotion regulation strategies (DERS), inability to positive reappraise the situation (CERQ) and rumination (CERQ) as being the best

predictors of GAD7 scores. The model with four predictors accounts for 52% of the variance in GAD-7 scores.

### **3.3.5 Hypothesis five. Resilience, as measured by the CD-RISC, will mediate the relationship between emotion dysregulation (DERS) and GAD (GAD-7).**

Mediation analyses were performed to determine whether resilience mediates the relationship between emotion dysregulation and generalised anxiety symptoms. The PROCESS (v2.16) add-on for SPSS (Hayes & Preacher, 2013) was downloaded from <http://www.afhayes.com>. The PROCESS macro uses bias-corrected bootstrapping, creating a new dataset based on random resamples (with  $N = 10,000$  bootstrap resamples) from the original dataset (Hayes & Preacher, 2013) and is useful for data that violate a normal distribution (Fritz & MacKinnon, 2007; Hayes & Preacher, 2013). Using this method, the upper and lower confidence intervals are examined, with the mediation being significant if the range does not include zero (Hayes & Preacher, 2013). In addition, the PROCESS macro also reports effect sizes for the mediation analysis and the indirect effect of the predictor on the outcome. This test is also suitable for non-normal distributions (Hayes & Preacher, 2013). None of the correlations already obtained within the analyses exceed a correlational coefficient of 0.7, thus collinearity does not pose a problem (Jose, 2013).

The mediation analysis of interest in the current analysis is illustrated in figure 11. The relationship between the predictor variable and the mediator variable is called the indirect effect and is denoted as  $a$ . The relationship between the mediator and outcome variable is also an indirect effect and denoted as  $b$ . The relationship between the predictor and outcome variables is the direct effect and denoted as  $c'$ . The total indirect effect is known as  $ab$ , as it incorporates both indirect effects. The label  $c$  is given to the total effect of the model.

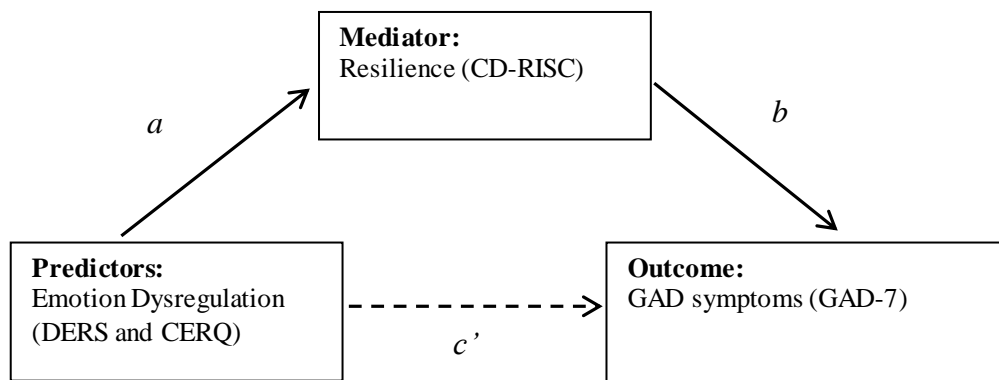


Figure 11. Mediation model.

The results from the mediation analyses are illustrated in Table 3.10. The unstandardized indirect effect was  $-.002$ , and the 95% bias-corrected confidence interval around the bootstrapped mean were  $LL = -.01$ ,  $UL = .01$ . These confidence interval contains zero and therefore the mediation was not found to be statistically significant at  $p < .05$  (see Table 3.10).

Table 3.10

*Summary of the Unstandardised Effects from Mediation Analysis with GAD-7 as outcome variable (10,000 Bootstrap samples).*

	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
Path a	.04	-.22	-5.64	p < .001	-.29	-.14
Path b	.02	.01	.39	p = .70	-.03	.05
Path c'	.01	.11	9.35	p < .001	.08	.13
Path c	.01	.11	9.99	p < .001	.08	.13

*Note.* LLCI = Lower Limit Confidence Interval; ULCI = Upper Limit Confidence Interval

### 3.3.6 Subsidiary Analyses

Given the low number of participants that met criteria for the clinical range of GAD as determined by the GAD-7, the PSWQ was also used as an indicator of GAD symptoms. Research by Behar et al. (2003) demonstrated that using a cut off of 45 on the PSWQ, determined GAD with a sensitivity of .99 and specificity of .98. Using this cut-off, 69 participants reached the threshold for GAD symptoms and 117 participants comprised the low GAD symptoms group. Both hypothesis 4 and hypothesis 5 were therefore recalculated using the PSWQ as the outcome measure, and re-labeled hypothesis 4 (b) and 5 (b) respectively to avoid confusion.

**3.3.6.1 Hypothesis four (b). Emotion Dysregulation, as measured by the DERS, will be a significant predictor of GAD symptoms (PSWQ).** A simple linear regression was calculated with PSWQ scores as the dependent variable and the total DERS score as the predictor variable. A significant regression equation was found ( $F_{(1, 185)} = 103.32, p < .001$ ), with an adjusted  $R^2$  of .36. The results therefore

support the hypothesis that emotion dysregulation is a significant predictor of GAD symptoms, as measured by the PSWQ.

A multiple linear regression analysis was conducted to identify the emotion regulation strategies that predicted GAD symptoms. Continuous variables that correlated with GAD symptoms (PSWQ) in univariate analyses ( $p < .01$ ) were also entered as potential predictors in the following regression analyses, including the CESD and CD-RISC. Subscales of the DERS and CERQ were only entered if they significantly correlated with the PSWQ. The GAD-7 was not entered as a predictor, as although significantly correlated with the PSWQ, it would be likely to overpower all other predictors. Marital status was included as a predictor variable, as in hypothesis 4. A stepwise method was chosen to take advantage of random sampling variation. A regression model including strategies (DERS), resilience (CDRISC), rumination (CERQ) and CESD best predicted scores on the PSWQ,  $F_{(4, 180)} = 39.18$ ,  $p < .001$ , with an adjusted R square of .45, thus explaining 45% of the variance (see Table 3.11).



Table 3.11.

*Regression table with emotion dysregulation (CERQ and DERS), CESD and CDRISC as predictor variables, and PSWQ as outcome variable.*

	B	SE B	$\beta$	Sig.
<b>Model 1</b>				
Strategies (DERS)	.75	.07	.62	$p < .001$
<b>Model 2</b>				
Strategies (DERS)	.67	.07	.55	$p < .001$
Resilience (CDRISC)	-.14	.04	-.21	$p < .001$
<b>Model 3</b>				
Strategies (DERS)	.54	.08	.45	$p < .001$
Resilience (CDRISC)	-.15	.04	-.23	$p < .001$
Rumination (CERQ)	.50	.15	.21	$p < .01$
<b>Model 4</b>				
Strategies (DERS)	.45	.09	.37	$p < .001$
Resilience (CDRISC)	-.15	.04	-.23	$p < .001$
Rumination (CERQ)	.42	.15	.18	$p < .01$
Total CESD	.20	.09	.15	$p < .05$

**3.3.6.2 Summary of Hypothesis four (b).** The results of the multiple linear regression demonstrate that, when using the PSWQ as the outcome variable

denoting GAD symptoms, emotion dysregulation predicts GAD symptoms. A multiple linear regression identified that having a limited access to emotion regulation strategies (DERS), a lack of resilience (CDRISC), rumination (CERQ) and depression symptoms (CESD) are the best predictors of GAD7 scores. The model with four predictors accounts for 45% of the variance.

**3.3.6.3 Hypothesis five (b). Resilience, as measured by the CD-RISC, will mediate the relationship between emotion dysregulation (DERS) and GAD (PSWQ).** A mediation analysis was conducted using the PROCESS macro (Hayes, 2013) as before (see section 3.3.5) however PSWQ scores were used as the outcome variable. The mediation analysis (Table 3.12) found an unstandardized indirect effect of .03, with a 95% confidence interval around the bootstrapped mean from LL = .01, UL = .05, suggesting that the relationship between emotion dysregulation and worry is partially mediated by resilience.

Table 3.12

*Summary of the Unstandardised Effects from Mediation Analysis with the PSWQ as the outcome variable (10,000 Bootstrap samples)*

	SE	B	t	p	LLCI	ULCI
Path a	-.22	.04	-5.64	<.001	-.30	-.14
Path b	-.11	.04	-2.69	.01	-.20	-.03
Path c	.23	.02	10.00	<.001	.18	.27
Path c'	-.20	.02	8.36	<.001	.16	.25

**3.3.6.4 Summary of Hypothesis five (b).** The results of the mediational analysis demonstrate that resilience partially mediates the relationship between

emotion dysregulation (DERS) and PSWQ scores, which although statistically significant, has a very small indirect effect.

## CHAPTER FOUR

### 4. Discussion

#### 4.1 Chapter Overview

This chapter begins by discussing the results of the analyses of the current study in relation to each of the original study hypotheses and with regard to relevant empirical research. The strengths and limitations of the study are considered and critically appraised, followed by an exploration of the theoretical and clinical implications of the research. Ideas for future research are presented, with the chapter presenting a final summary and conclusion.

#### 4.2 Summary of Findings and Comparisons with Existing Literature

##### 4.2.1 Hypothesis one.

Hypothesis one explored whether participants defined within the high GAD symptoms group, characterised as scoring above cut-off on the GAD-7 measure (Spitzer et al., 2006) differed from participants with minimal symptoms of generalised anxiety disorder (the low GAD symptoms group), in terms of emotion dysregulation scores (as measured by the DERS; Gratz & Roemer, 2004) and resilience scores (as measured by the CD-RISC; Connor & Davidson, 2003).

**4.2.1.1 Emotion Dysregulation.** When the overall sample were differentiated by the cut-off scores on the GAD-7, the results showed that the groups statistically significantly differed with regard total scores in emotion dysregulation, as measured by the DERS questionnaire. Participants in the high GAD symptoms group demonstrated higher mean total emotion dysregulation scores on the DERS questionnaire.

A comparison was also made using the individual subscales of the DERS, with the results suggesting that participants in the high GAD symptoms group report statistically significantly higher scores in the following subscales; difficulty engaging in goal-directed behavior, non-acceptance of emotional responses, limited access to emotion regulation strategies and impulse control difficulties. This set of results suggests that there are specific emotion regulation difficulties that are utilised in participants with high levels of GAD symptoms.

However, there were no statistically significant differences reported between the groups in terms of emotional awareness. Similar non-significant results for emotional awareness have been found in other research (e.g. Salters-Pedneault, Roemer, Tull, Rucker & Mennin, 2006; Marganska et al., 2013). Salters-Pedneault et al. (2006) conducted research assessing the relationship between emotion dysregulation and GAD, as measured by the GAD-Q-IV and PSWQ. To determine whether differences existed in the DERS subscales between those the analogue GAD sample and analogue non-GAD sample, t-tests were conducted. Statistically significant differences were reported between the groups in terms of difficulties with emotion regulation in general, as well deficits in the specific subscales of emotional acceptance, ability to engage in goal directed behaviour, impulse control, clarity of emotional experiences and access to emotion regulation strategies. Limited research has been conducted using the DERS questionnaire and therefore the results need to be interpreted with caution, however preliminary research suggests that individuals with GAD do not have significantly different deficits in their awareness of emotional experience.

The Emotion Dysregulation (ED) Model of GAD (Mennin et al., 2005) postulates that people with GAD are characterised by poor understanding of

emotions, negative reactivity, a heightened intensity of emotions and maladaptive management of their emotions. Whilst the DERS was not devised purely to measure the ED model, the measure has previously been used within research testing this model, as some of the subscales share similarities with the ED model components. Research by Marganska et al. (2013) used the clarity and awareness subscales to evidence poor understanding of emotions, the impulse subscale to evidence heightened intensity of emotions and the limited access to emotion regulation strategies subscale to investigate maladaptive management of emotions (Mennin et al., 2005; Marganska et al., 2013). Therefore, the same subscales will be utilised in the same way in the current research.

With regard to maladaptive management of emotions, the results of the current research suggest participants with high GAD symptoms have statistically significantly more difficulty with emotion regulation strategies as measured by the DERS, in keeping with the ED model of GAD (Mennin et al., 2005). This was reflected in the significant difference found between the high GAD symptoms and low GAD symptoms groups for the limited access to emotion regulation strategies and difficulty in engaging in goal-directed behaviour subscales of the DERS. In addition, when comparing the nine factors of the CERQ, the results demonstrated that the high GAD symptoms group reported statistically significantly higher use of maladaptive strategies (self-blame, rumination and catastrophising), and were significantly less likely to use adaptive strategies such as positive reframing, refocusing on planning, positive reappraisal and putting into perspective. No statistically significant difference was found between the groups for acceptance or blaming others.

The existing literature base generally supports that postulation that participants with GAD, utilise maladaptive strategies in an attempt to regulate their emotions (e.g. Mennin et al., 2005; Turk et al., 2005; McLaughlin et al., 2007; Marganska et al., 2013). However, in contrast to the results of this research and the ED model, Decker et al. (2008) used daily diaries and questionnaires to capture participants' emotion regulation experience, and found that participants within the GAD group reported a greater use of emotion regulation strategies. Therefore, during times of heightened emotions, individuals with GAD may attempt to utilise a larger number of strategies, in an attempt at emotion regulation. It may be that due to difficulties in regulating emotions however, participants with GAD need to use a number, before successful regulation occurs. Employment of a different research design, allowing for in the moment recording of strategies used, may have increased the accuracy of participants' recall and consequently produced different results. Indeed, accuracy of data, is often cited as a limitation of relying on general retrospective self-report measures.

The ED model (Mennin et al., 2005) also proposes poor understanding of emotions to be implicit within those with GAD, which is measured within the current research with the clarity and awareness subscales of the DERS. The current research found that there was no statistically significant difference between participants in the high GAD and low GAD groups in terms of awareness however participants in the high GAD symptoms group showed a greater lack of emotional clarity. Previous research has also found mixed results. Mennin et al. (2005) in the first of three studies, and research by McLaughlin et al. (2007), found that participants in the GAD group had poorer understanding of emotions supporting the ED model of GAD. Mennin et al. (2005) utilised a cross-sectional design, with a

combination of the ACS, TAS-20, TMMS and the BEQ to determine emotion dysregulation. In contrast, McLaughlin et al. (2007) conducted a quasi-experimental study using the DERS to measure emotion dysregulation and film clips to manipulate mood. Both utilised an analogue sample, distinguishing between the GAD and control group using scores on the GAD-Q-IV and the ADIS-IV respectively. Despite the differences in measures and study design, participants in the GAD group in both studies, demonstrated poorer understanding of their emotions.

In contrast, results from the third study by Mennin et al. (2005), and Decker et al. (2008) did not find statistically significant differences between GAD symptom group and the control group in terms of understanding emotions. Decker et al. (2008), aforementioned, utilised daily diaries using positive and negative emotion differentiation indexes based on participant's daily ratings. When participants were differentiated as either meeting GAD DSM-IV criteria or not using the GAD-Q-IV, no statistically significant difference was found, either for positive or negative emotion differentiation. Thus it may be that, in the moment, participants with GAD have no difficulties differentiating and understanding real emotional states, but demonstrate a poorer understanding of emotions when they are not spontaneous, but experimentally manipulated or retrospectively rated.

The current research, also demonstrates non-significant findings however uses an analogue sample and self-report measures, with participants in the high GAD symptoms group reporting similar understanding of emotions to participants in the low GAD symptoms group. The current research utilises the GAD-7 to determine group allocation, with participants scoring 10 or higher comprising the high GAD symptoms group, and those below 10, becoming the low GAD symptoms group. The



GAD-7 however, when used as a screening tool, classifies individuals into 3 groups; mild symptoms, moderate symptoms and severe symptoms, and therefore it may be that the dichotomous classification was not sensitive enough to detect group differences. For example, it may be that differences exist between those in the mild symptoms group compared to those in the severe symptoms group however this information was lost in the current study.

In contrast to the ED model of GAD, Novick-Kline et al. (2005) found that those with GAD symptoms demonstrated greater emotional awareness than controls. Rather than using a cross-sectional self-report measure such as a questionnaire, Novick-Kline et al. (2005) utilised rater-coded scores and suggested that the difference between their findings and others was due to the common variance method and the reliance on self-report. This could also be a critique of the current research design, which also uses self-report measures. However, the measures used are not the same as those utilised in the research by Mennin et al. (2005). In addition, the recruitment method utilised, reaches a wider population than just students, increasing the generalizability of the current research.

With regard to intensity of emotion, as measured by the impulse subscale of the DERS, the results of the current research found that there was a significant difference between the high GAD and low GAD symptoms participants, with high GAD participants showing greater impulse control difficulties, suggesting a heightened intensity of emotion. Whilst the use of the impulse subscale of the DERS has previously been used in research to determine intensity of emotion, it is important to be cautious in interpreting these results. As previously mentioned, the DERS was not created to investigate the four components of the ED model and

therefore has limitations in its use. Furthermore, the use of the impulse subscale questions to determine intensity of emotions may lack face validity.

The results however are in keeping with previous research using self-report questionnaires (e.g. Mennin et al., 2005) and research by Decker et al. (2008) using daily diaries in which participants rated their most intense emotion of the day. McLaughlin et al. (2007) used a quasi-experimental design, with film clips used to manipulate mood. The results demonstrated that with regard to a heightened intensity of emotions, the results were only statistically significant in the GAD group if they participants were also assigned to the worry condition, rather than other experimental conditions. This suggests that it is the process and experience of worry that is implicated in a heightened intensity of emotions, rather than just the presence of GAD.

As discussed, the current research provides some support for two of the four components of the ED model of GAD, namely that participants with high GAD symptoms in the current research demonstrate greater use of maladaptive strategies and experience a greater intensity of emotions (Mennin et al., 2005). Due to the research design and the self-report questionnaires used in the current research, the negative reactivity component of the ED model could not be investigated. Furthermore, it is important to be cautious in interpreting these findings. The emotion regulation measures used, namely the DERS and CERQ, classify emotion regulation strategies as either being adaptive or maladaptive. There are suggestions however, that such categorization is too dichotomous, and that it may be the flexibility in use of emotion regulation strategies that is of most benefit (Williams, 2002). For example, acceptance is seen as a positive emotion regulation strategy, describing the process of “accepting what you have experienced and resigning

yourself to what has happened” (Min et al., 2013, p. 1191). Whilst this has benefits in situations that cannot be changed, it may not be as positive if it is a difficult or distressing situation that can be problem-solved and changed. The emotion regulation measures used within the study, are unable to determine such subtle differences.

**4.2.1.2 Resilience.** Using the cut off score of 10 on the GAD-7 to determine high GAD symptoms and the low GAD symptoms groups, results suggested that the groups statistically significantly differed with regard to total resilience scores as measured by the CD-RISC questionnaire. Participants in the high GAD symptoms group ( $GAD-7 \geq 10$ ) demonstrated statistically significantly lower mean resilience scores, compared to participants in the low GAD symptoms group. It may be that higher levels of resilience buffer against the development of GAD symptoms, or conversely, that the development of GAD symptoms leads to a reduction in resilience. A limitation of this analysis is that causation cannot be determined.

Research investigating the role of resilience in GAD is under-researched however, the finding that those with high GAD symptoms have significantly lower levels of resilience is in keeping with literature investigating resilience in participants with anxiety symptoms in general. Bitsika et al. (2010) utilised a sample of 401 undergraduate students, administering a number of self-report measures including the CD-RISC, Zung-SAS and the Zung-SDS. The results demonstrated that participants who met the cut-off for clinical significant anxiety on the Zung-SAS (Zung, 1980), that significantly lower CD-RISC scores. Furthermore, participants scoring above the cut-off for clinically significant depression, were also found to have lower levels of resilience, as determined by CD-RISC scores.

Given that there is limited research in this area, evaluating the current results in light of other literature is more challenging. Research tends to support the hypothesis that lower levels of resilience are found in individuals with higher anxiety scores, however the lack of research contradicting this may be indicative of a publication bias (Granqvist, 2015), whereby research demonstrating a non-significant or contradicting result, is either not submitted for publishing by researchers, or otherwise is not accepted for publishing.

#### **4.2.2 Hypothesis two.**

Hypothesis two predicted a relationship between GAD symptoms (GAD-7 scores), and resilience (CD-RISC scores), and predicted that higher GAD scores on the GAD-7 would correlate to lower CD-RISC scores. The results demonstrated a negative correlation between the variables, however only a small effect size was found, using Cohen's criteria (1988). The correlation between GAD-7 scores and CD-RISC scores demonstrated a correlation of .21, and therefore the results need to be interpreted with caution. Whilst statistically significant, only 4.4% of variance is explained by this relationship, suggesting that there are other variables involved. No investigations to date have examined the relationship between resilience and GAD symptoms. However, research has found a relationship between anxiety symptoms and resilience in a clinical population (e.g. Min et al., 2013; Min et al., 2015) and in non-clinical populations (e.g. Bitsika et al., 2013; Hou & Ng, 2014). Min et al. (2013) found a large effect size ( $r = -.60$ ) for the correlation between anxiety (STAI-S scores), and resilience (CD-RISC scores), compared to the small effect size demonstrated in the current research. The difference in the magnitude of the effect may be indicative of differences between GAD and anxiety symptoms in general, or it may be in part due to the clinical sample used by Min et al. (2013)

whereby the relationship between resilience and anxiety is more prominent in individuals with clinical levels of anxiety.

Hegberg and Tone (2015) found different results dependent on the level of trait anxiety reported by participants, in research considering the role of physical activity (PA) resilience and trait anxiety. The results demonstrated that the interaction between PA and resilience was only demonstrated in participants with self-reported high trait anxiety, as measured by the STAI-T. Hegberg and Tone (2015) suggest that this result may be indicative of a dose-response relationship whereby the relationship between resilience and PA increases as anxiety increases. Therefore, it may be that resilience demonstrates a greater relationship in individuals with high levels of anxiety. The current research utilised a general population sample, of which only 37 participants met criteria for high levels of GAD symptoms, thus the strength of the relationship may be limited by the small number of participants in the high GAD symptoms. In addition, participants' mean resilience scores were below what might be expected given Connor & Davidson's (2003) validation data, which reduced the variance of scores observed, and may also have affected the ability to determine a correlation of greater magnitude.

#### **4.2.3 Hypothesis three.**

Hypothesis three explored whether higher levels of GAD, as measured by the GAD-7, were correlated with higher levels of emotion dysregulation, as measured by the DERS. The data suggests there were statistically significant associations between the variables, with a large effect size ( $r = .59$ ). This is in keeping with literature highlighting the role of emotion dysregulation in GAD symptoms (e.g. Mennin et al., 2005; Marganska et al., 2013) and is a correlation of similar

magnitude ( $r = .55$ ) to that found by Roemer et al. (2009) between the DERS questionnaire and GAD-Q-IV scores.

The analyses also considered the relationship between GAD and individual subscales of the emotion regulation measures (DERS and CERQ) in order to further elucidate the exact components of emotion regulation that had a particular relationship with GAD symptoms. The results showed significant positive relationships for five out of six subscales of the DERS questionnaire, with medium to large effect sizes. Lack of emotional awareness however, was not shown to be statistically significantly correlated with GAD-7 scores.

A number of the research studies utilising the DERS to test emotion regulation, do not report statistics on the individual subscales, thus making comparison to other literature more challenging. Given that the current research has demonstrated that there was no statistically significant difference between the high GAD symptoms and low GAD symptoms groups in terms of lack of emotional awareness, it is unsurprising that a non-significant correlation relationship has been found.

Within the nine subscales of the CERQ, seven were found to be significantly correlated with GAD, the largest of which was positive reappraisal. However, acceptance, that is accepting what has happened and resigning yourself to the outcome, and blaming others for your experience, were not found to be significantly correlated with GAD-7 scores. Similarly, Min et al. (2013) found a non-significant relationship between anxiety and acceptance, however blaming others was found to have a significant correlation with anxiety. It may be that blaming other people is a strategy that is more commonly related to anxiety in general, whereas given that worry is a key symptoms of GAD and generally an internal cognitive process,

blaming others may be less utilised as a cognitive emotion regulation strategy. In addition, Min et al. (2013) utilised a clinical sample of participants with diagnosed anxiety disorders, and therefore the results again, may be indicative that there are some emotion regulation strategies that are more frequently utilised in participants meeting clinical levels of anxiety and requiring treatment, compared to individuals merely reporting high levels of anxiety symptoms. The use of the CERQ, as a measure of emotion regulation difficulties in individuals with GAD symptoms, is relatively under-used as a measure, and as such, there is limited research at present to provide a thorough evaluation of the current results.

Overall, there are a number of emotion regulation difficulties that show statistically significant correlations with GAD-7 symptoms, however it appears to be ‘difficulty accessing emotion regulation strategies’, as measured by the DERS questionnaire, which demonstrates the highest correlation with GAD symptoms (GAD-7), explaining 36% of the variance. This suggests that it is particularly greater difficulties using emotion regulation strategies to manage one’s anxieties and experiences, that are related to higher levels of GAD-7 scores. Despite this, there remains a large portion of the variance in these scores unaccounted for, and as such, points to additional factors implicated in GAD symptoms.

#### **4.2.4 Hypothesis four.**

Hypothesis four explored whether emotion dysregulation is a significant predictor of GAD. The results demonstrated that a model containing CESD scores, difficulties accessing and using emotion regulation strategies, difficulty positively reappraising situations and rumination were the best predictors of GAD-7 scores. Thus the results suggest that it is a combination of difficulty using emotion regulation strategies and depression symptoms that are predictive of GAD

symptoms. When the same regression analyses were run using PSWQ scores as the outcome variable, positive reappraisal was not found to be predictive of worry however, resilience, as determined by CD-RISC scores, was a significant predictor. Difficulties with emotion regulation strategies, depression symptoms and rumination continued to remain significant predictors of worry within the regression model. These findings are not entirely surprising. The ED model of GAD (Mennin et al., 2005) suggests that individuals with GAD have more difficulty accessing and using emotion regulation strategies and thus its inclusion as a significant predictor of GAD symptoms is as would be expected, and further highlights its theoretical importance within GAD.

Previous literature has also discussed the similarities between depression and GAD diagnoses (e.g. Grant et al., 2005). The current research has demonstrated that depression scores (CESD) are a significant predictor of GAD scores (for both GAD-7 and PSWQ scores). This is in keeping with previous research by Kessler et al. (2009), which analyzed data from a follow up National Comorbidity Survey (NCS), consisting of 5001 participants from a representative general population sample. The results found that baseline MDD predicted onset of GAD, and baseline GAD predicted onset of MDD. The authors however, argue that differences were found in the risk factors for each (e.g. childhood adversities, personality dimensions), which evidences against MDD and GAD being representative of a single internalizing syndrome. Within the current regression model, rumination was found as a significant predictor of GAD symptoms (GAD-7 and PSWQ), again highlighting the similarities between MDD and GAD. In addition, research has demonstrated the link between rumination and depression and anxiety, such as that by McLaughlin,



Borkovec and Sibrava (2007), who found that rumination inductions increase both depressed and anxious mood.

Not all research supports the regression model demonstrated in the current research. Min et al. (2013) conducted regression analyses to determine a model that best predicted anxiety and found that engagement in catastrophizing, and less frequent use of positive refocusing predicted anxiety symptoms. In the current research these were not found to be significant predictors. This may be due to the sole use of the CERQ as a measure of emotion regulation strategies compared to the current research that also utilised the DERS. In addition, it may highlight the differences between anxiety disorders as a whole and GAD.

Garnefski and Kraaij (2007) in validation of CERQ found most significant predictors of anxiety symptoms were positive reappraisal, catastrophizing, rumination and self-blame (Time 1). At follow up (time 2) only positive reappraisal and catastrophizing reached the level of significance. Within the current research, of the four predictors found by Garnefski and Kraaij (2007), only positive reappraisal and rumination were found to be significant predictors of GAD symptoms, as measured by the GAD-7 and only rumination, when using the PSWQ as the outcome measure. This highlights some differences with regard to the emotion regulation factors that predict anxiety symptoms in general, and those which are more specific to GAD symptoms. In addition, the results from the research by Garnefski and Kraaij (2007) highlight that changes can occur in emotion regulation difficulties, thus highlighting the importance of follow-up studies.

**4.2.5 Hypothesis five. Resilience, as measured by the CD-RISC, will mediate the relationship between emotion dysregulation (DERS) and GAD (GAD-7).**

The final hypothesis explored whether resilience mediated the relationship between emotion dysregulation and GAD symptoms. A mediation analysis was used to test the hypothesis that individuals with more adaptive emotion regulation skills, would be better able to manage their emotions; and that individuals who were effectively able to regulate their emotions would be able to utilise stressful situations to build on, and utilise resilience. As a result of this, this greater level of resilience is hypothesised to buffer against symptoms of GAD.

Two mediational models were investigated, the first using GAD-7 scores as a measure of GAD symptoms, and the second using the PSWQ scores as a measure of worry, and indicator of GAD symptoms. The results demonstrated that resilience, as measured by the CD-RISC, did not mediate the relationship between total DERS scores (emotion regulation) and GAD-7 scores, however there was a small partial mediation when the PSWQ was used as the outcome measure. When PSWQ scores were used as the outcome measure however, emotion regulation had a direct effect on worry, as well as an indirect effect through resilience. The indirect effect, although statistically significant, was very small accounting for less than 1% of the variance. Therefore, these results should be interpreted with caution.

To date there has not been a mediator model investigated with resilience as the proposed mediator between emotion dysregulation and GAD. Troy and Mauss (2011) however suggested a moderation model, whereby individuals who have high cognitive emotion regulation ability, should demonstrate an increased likelihood of resilience in the face of stressful life events. Whilst the current research focused on GAD, a similar relationship between emotion regulation and resilience was proposed, such that emotion regulation influences resilience.

Hou and Ng (2014) have conducted research looking at a mediation role and proposed that emotion focused positive rumination would mediate the inverse relationship between resilience and anxiety symptoms. Positive rumination refers to ruminating on the positive qualities and characteristics about oneself, positive affective experiences, and favourable life circumstances. Self-report measures were used, including Chinese validated versions of the 9-item Resiliency Scale (RS; Siu et al., 2009), 5-item emotion focus subscale of the Responses to Positive Affect Questionnaire (RPA-EF; Feldman et al., 2008) and the 20-item state version of the State Trait Anxiety Inventory (STAI-S; Shek, 1988). The mediation model showed a significant direct effect of resilience on anxiety symptoms, with a small indirect effect found for the role of positive rumination as a mediating variable. Whilst both the current research, and that by Hou and Ng (2014) found only small mediation effects, both highlight the important inter-related role between emotion regulation, resilience and anxiety symptoms.

Given the mediation model used in the research by Hou and Ng (2014), the current study could have utilised a different mediation model and still made theoretical sense. For example, in line with Hou and Ng (2014), it might be that emotion regulation mediates the relationship between resilience and GAD symptoms. The mediation model utilised in the research was chosen given the already established predictive relationship between emotion dysregulation and GAD, and the proposed framework of resilience established by Troy and Mauss (2011). At the time this research was conducted, Hou and Ng (2014) had not published their research and so their findings could not be considered.

#### **4.2.6 Summary of the Findings**

This research provides support for the role of emotion dysregulation in GAD, providing evidence for two of the four components (intensity of emotions and maladaptive use of emotion regulation strategies) outlined in the ED model (Mennin et al., 2005). Partial support was also found for the role of poor understanding of emotions in GAD. Previous research has also shown that emotion dysregulation is predictive of GAD symptoms (e.g. Mennin et al., 2005) and the current research supports this link, using different measures of emotion regulation (DERS and CERQ).

A series of regression analyses were conducted using GAD-7 and PSWQ scores as the outcome variables. The results demonstrated some similarities in the prediction of GAD symptoms regardless of outcome measure used, namely depression scores (CESD), rumination (CERQ subscale) and maladaptive use of emotion regulation strategies (DERS subscale). A fourth predictor was identified in each regression model, with GAD-7 scores also being best predicted by positive reappraisal (CERQ subscale), and PSWQ scores by resilience scores (CD-RISC). This suggests that there are core components predictive of GAD in general, regardless of the measure used, but also indicates that resilience may be better predictive of worry than general GAD symptoms.

The current research sought to add a new component to the proposed ED model to discover whether the buffering effects of resilience mediated the inverse relationship between emotion regulation and GAD. Resilience was shown to be inversely correlated with GAD demonstrating that higher levels of resilience are associated with lower levels of GAD symptoms. Additionally, resilience scores were found to be significantly higher in participants in the low GAD symptoms group compared to the high GAD symptoms group. These findings suggest that resilience

may have a role in GAD symptomology, however the link demonstrated in the current research is tenuous. Further research is required in this area to identify whether this relationship exists.

The mediation model was proposed given that individuals with more adaptive emotion regulation skills would be likely to have been able to understand, manage and express emotions in an adaptive way in the face of stressors, leading them to a greater resilience, which in turn is hypothesised to result in reduced GAD symptomology. The mediation model using GAD-7 scores as the outcome variable was non-significant, however when the PSWQ was used as the outcome variable, a partial mediation was found. This suggests that resilience partially mediates the relationship between emotion dysregulation and worry. The results should be interpreted with caution however, given that the mediation has an indirect effect of .03.

The current research did not find overwhelming evidence supporting resilience mediating the relationship between emotion dysregulation and GAD. This may indicate that such a relationship only weakly exists, however may also be indicative of the limited sample of individuals with GAD symptoms within the current research. The role of resilience in GAD is under-researched, and as such an evaluation of the current results in relation to existing literature is challenging. Dugas, Anderson, Deschenes and Donegan (2010) looked at the publications about GAD, and found that when considering anxiety disorder publications, GAD had the second lowest annual rate of publications in any given year, with PTSD having the highest. Future research investigating GAD symptoms and its theoretical underpinnings are therefore of great importance.

### **4.3 Evaluation of the Current Research Design**

Within this section, the research design utilised within the current study will be evaluated and will include discussion around the limitations of the current research. Particular emphasis will be on the evaluation of the design, participants and recruitment, the measures used, the procedure and data analyses.

#### **4.3.1 Design**

A cross-sectional design was utilised in line with other research conducted in the area (e.g. Mennin et al., 2005; Min et al., 2013). In addition, given that the current research was also exploratory in nature, namely with the inclusion of resilience as a mediating variable, a cross-sectional design was deemed most appropriate. However, cross-sectional designs cannot determine causal relationships and therefore whilst one can determine relationships between variables, the causal effect remains unknown. Future research may use prospective studies to better determine the causal effect of emotion dysregulation and GAD, and also consider the role of resilience. Research (Garnefski & Kraaij, 2007) has also pointed to changes in emotion dysregulation scores over time, and therefore it is important that this is captured.

#### **4.3.2 Participants**

A non-clinical, adult sample was recruited from a number of internet sites to address the research questions. In order to maximize the opportunity to recruit as many participants with GAD symptoms, as well as participants without GAD symptoms, adverts for the research were posted in online anxiety self-help forums, as well as through social media channels. This allowed access to a large sample, meeting recruitment targets within the time constraints of this thesis.

Some limitations of the sample included the small number of participants that reached threshold for GAD ( $GAD-7 \geq 10$ ). This is in part due to the recruitment strategy which favoured internet recruitment, and the low up-take from online self-help groups. However, validation data by Lowe et al. (2008) found that in their general population sample, 5% of participants had a GAD-7 score of 10 or greater, whereas the current study found approximately 20% of participants scored in this range suggesting there may have been some success in recruiting participants with GAD symptoms.

The GAD group utilised was not a clinical sample, but an analogue sample of participants displaying GAD symptoms. An analogue sample was chosen given research suggesting that there are a large number of people in the general population who have GAD, but who have not received a diagnosis. Whilst analogue samples have their limitations, given the exploratory nature of the research question and the convenience of such a sample, it was deemed appropriate. Abramowitz, Fabricant, Taylor, Deacon, McKay and Storch (2014) reviewed evidence regarding the use of analogue samples, particularly focusing in their review on OCD. Abramowitz et al. (2014) suggest that in order for an analogue sample to be relevant to a particular disorder, symptoms should be sufficiently prevalent in community samples, that the disorder specific symptoms should exist on a continuum, the qualitative nature of symptoms should be the same across samples, there should be etiology continuity, and the same psychological processes underpinning the development and maintenance of symptoms needs to be equivocal in clinical and non-clinical analogue samples. All these criteria appear to be met within GAD symptoms and therefore an analogue sample was utilised.

A power calculation was conducted to determine the sample size necessary to conduct the analyses. The power calculation yielded a sample size of 74 necessary to compare group differences, and 162 to sufficiently power the multiple regression analyses. The estimated sample size was calculated based on a small effect size (0.25) given the introduction of a new variable (resilience) that had not yet been studied in relation to GAD symptoms. The final sample was 187 participants completed the research questionnaires, thus ensuring the analyses were sufficiently powered.

### **4.3.3 Measures**

The use of self-report measures are thought to be appropriate given the research design, hypotheses and the under-explored relationship between resilience and GAD. There are however, as have been previously mentioned, limitations associated with the use of self-report questionnaires; particularly that they rely on the accurate and honest recollection of information by the participant, and can be subject to social desirability bias (Paulhus, 1991). It was hoped that the online nature of the study would alleviate some of the problems associated with desirability bias. Furthermore, Novick-Kline et al. (2005) raised the issue of common method bias whereby repeated use of the same method and measures will yield similar results. The current research therefore, although has a similar methodology to other cross-sectional research, utilises different measures and a large general population sample.

The current research benefitted from the use of psychometrically robust measures in line with other research (e.g. Mennin et al., 2005, Min et al., 2013). The CD-RISC (Connor & Davidson, 2003) is among the highest psychometrically rated resilience measure (Windle et al., 2011), and has been used extensively in research, allowing comparisons to be made with other samples. Within the current sample, the



average resilience score on the CD-RISC was 51.61 (SD=13.69) which is lower than would be assumed given the general population sample and the validation data by Connor & Davidson (2003). The original data for the CD-RISC showed the general population sample had a mean score of 80.4 (SD=12.8) and the GAD group had a mean score of 62.4 (SD=10.7). The low total mean resilience score found in this sample, may have impacted the data and the small effect size found, reducing the variance. Furthermore, Sood et al. (2011) reported lower resilience scores than expected, in a sample of non-clinical, hospital staff members recruited to take part in a resilience training program. Therefore, this, combined with the current results, may suggest that levels of resilience have generally reduced in the population over time, or may simply be reflective of the participants sampled within these studies.

The current research utilises the GAD-7 questionnaire (Spitzer et al., 2006) as a measure of GAD symptoms. A cut-off score of 10 is used to group participants in to high GAD symptoms and low GAD symptoms groups, chosen as it achieved the best balance of sensitivity and specificity (Spitzer et al., 2006). However, the GAD-7 categorises scores in to three groups with individuals scoring 0 – 5 showing mild symptoms of GAD; people scoring 6 – 10 being classed as having moderate symptoms; and those scoring 11-15 scoring in the severe range (Spitzer et al., 2006). Given this, there may not have been much differentiation in GAD symptoms between the groups. Instead, those in the severe range (scoring 11 – 15) could have been compared to those reporting only mild symptoms (0 – 5) to ensure there was enough difference between the groups in terms of GAD symptoms, to render conclusions about differences, more meaningful.

This research also uses two measures of emotion regulation, one focusing solely on emotion dysregulation (DERS) and one considering both adaptive and

maladaptive emotion regulation strategies (CERQ). The use of two emotion regulation measures was chosen to ensure as many aspects of emotion regulation were measured, however this may have unnecessarily increased the load on participants and biased the sample.

Given that the DERS and CERQ questionnaires, do not include questions to measure negative reactivity to one's emotional state, it is difficult to use updated measures, and effectively and extensively address the ED model of GAD (Mennin et al., 2005). This is a limitation of the current research with regard to providing support for the ED model of GAD. However, as the aim of this research was to investigate more than the ED model, the use of the updated ER measures was seen to be appropriate within the context of the current research, and in furthering and building upon previous literature.

#### **4.3.4 Procedure**

This research used online methods to recruit a sample of participants with and without GAD symptoms who completed an online survey. This was advantageous in reducing experimenter bias and allowing anonymity for participants (Meho, 2006) however, this method was not sufficient to recruit a large sample with GAD symptoms. This potential difficulty was foreseen, and was attempted to be overcome through advertisement on anxiety forums and through charities such as 'Mind'. Whilst 20 website creators were emailed to request permission to post a link to the study on their websites, the majority either did not respond, or were unable to acquiesce. One website ([www.uncommonforum.com](http://www.uncommonforum.com)) allowed a link to be posted, and 'Mind' allowed for a link to the research to be posted on their social media sites however, as figure 9 (section 2.3.5) demonstrates, this was only accessed by 12 participants. The research might have been better advertised to people who may

have GAD symptoms in public areas such as in Doctor's Surgeries waiting rooms, or in mental health clinic waiting rooms.

The use of online methods was helpful in recruiting a large sample overall, and allowing for participants to complete the research questionnaires at a time and in a place that was most suitable for the individual. In order to ensure participants were able to ask questions about the research, contact details were provided. This is beneficial in ensuring that consent is fully informed however no participants within the current study made use of this. This may be a limitation of solely online research, as the anonymity gained may also have prevented participants from contacting with any questions, and as such potential participants may have chosen not to take part. This may have particularly been an issue for individuals with greater anxiety symptoms.

#### **4.3.5 Data Analyses**

Where possible, parametric analyses were used however some of the statistical analyses relied on non-parametric statistics which reduces the power to determine if a true effect exists (Field, 2009). Bonferroni corrections were applied when several independent correlations were conducted (Cabin & Mitchell, 2000) to minimize the likelihood of obtaining a Type I error.

The cut-off score on the GAD-7 to determine group allocation to the high GAD symptoms or low GAD symptoms group, created unequal sample sizes. It is suggested that unequal sample sizes can affect the homogeneity of variance assumption (Fields, 2009), required to calculate the ANOVA statistic however, the Levene statistic revealed that this assumption was met within all analyses in the current dataset. Given this, the unequal sample sizes are unlikely to have affected the results.

Multiple linear regression analyses were utilised with predictors entered using a stepwise method. This method was chosen to take advantage of random sampling variation, and given the unknown element of some of the variables, such as resilience. However, it might have been appropriate to have manually entered variables based on previous research. Demographic variables were also entered as predictor variables, if they were found to show statistically significant differences between the high GAD and low GAD symptoms groups in the preliminary analyses. Again, a more theoretical approach based on past literature may have ensured any potential demographic variables that have a predictive relationship with GAD-7 scores were reported, such as gender.

This thesis employed mediation analyses, which were conducted using bootstrapping, as they do not necessitate the data to be normally distributed (Preacher & Hayes, 2004). The PROCESS macro for SPSS was downloaded in order to conduct these analyses. Mediation analysis was deemed appropriate given the research question. However, given the low resilience scores found within the sample, and the subsequent reduced variance, this may have impacted the mediating effect of resilience in the current research. In addition, the low number of participants with GAD-7 scores indicative of clinically significant levels of GAD symptoms, may have reduced the ability to determine a mediation effect.

#### **4.4 Theoretical Implications**

Interestingly, whilst the overall number of individuals with GAD symptoms reaching the threshold on the GAD-7 was small, the percentage of individuals reporting GAD symptoms were higher in this sample than suggested in prevalence studies. Kessler et al. (2004) suggest that when sampling the general population, 8%

of individuals would have GAD symptoms, yet within the current sample, approximately 20% had GAD symptoms that reached the cut off of 10 on the GAD-7. This may be due to the current sample effectively recruiting participants with GAD symptoms, or may also indicate a change in prevalence in the last 12 years.

Additionally, the mean resilience scores reported for the sample within the current research were a lot lower than might be expected in a general population sample, based on the norms provided by Connor & Davidson (2003). This has also been shown in other research (e.g. Sood et al., 2011). Given this, it may be that research reviewing the norms for these standardized measures would be useful in addressing some of these discrepancies found between the original validation and norm data, and that found in research today.

This research also further highlights the link between depression symptoms and GAD symptoms that has been elucidated in previous research (e.g. Kessler et al., 2007). A strong correlation was found between depression scores (CESD) and GAD scores (GAD-7), and both CESD scores and rumination, were found to be significant predictors of GAD symptoms. Research by Ruscio, Gentes, Jones, Hallion, Coleman and Swendsen (2015) investigated rumination and heightened stress sensitivity in MDD and GAD. The results found that rumination was utilised as frequently in MDD and GAD. Rumination was also found to mediate the relationship between stress and affect, and with depression symptoms. Whilst this research did not specifically set out to investigate the relationship between depression symptoms and GAD, given the identification of CESD scores and rumination as predictors of GAD scores, this research provides further evidence towards a relationship between MDD and GAD.

As has been discussed (section 4.2.1.1), this research provides some support for components of the ED model of GAD, contributing to the literature in this area. This research successfully addressed three out of the four components of the ED model, using a non-clinical sample and using different questionnaires than that of the original research by Mennin et al. (2005). Only two of the three emotion dysregulation components however were found to be statistically significant in participants with high GAD symptoms, thus casting some caution over the use of the ED model in its entirety.

This research highlights the particular importance of maladaptive use of emotion regulation strategies, found to be predictive of GAD symptoms. Whilst only 34% of the variance in GAD-7 scores is explained by emotion dysregulation strategies, Fichman (1999) argues that small variances can still have a big practical impact and theories should not be discounted on the basis of limited variation explained. In addition, social science research is inherently complex, given the sheer number of confounding and co-varying variables at play and thus, emotion regulation difficulties appear to have a role to play in GAD symptoms.

The current research did not find the relationship one might expect between GAD symptoms and resilience, given previous literature demonstrating the relationship between resilience and anxiety. Interestingly, resilience shared a greater association with worry, as measured by the PSWQ, and was found to be a predictor of worry, however this relationship was not replicated for GAD symptoms (GAD-7 scores). Therefore, it may be that the resilience specifically impacts worry, which is central within GAD, however not exclusive to GAD. This may also indicate why resilience was not shown to have a significant predictive relationship with GAD symptoms in general.

#### **4.5 Clinical Implications**

In line with previous research, the results of the current study have demonstrated that emotion regulation difficulties, as measured by the DERS and CERQ, are related to and in part, predictive of GAD symptoms (GAD-7 scores). This has implications for future therapeutic treatments, such that the teaching of adaptive emotion regulation strategies as a way of coping and managing difficult emotion experiences and feelings, may be important to enhance therapeutic gains in CBT treatments for GAD. Whilst CBT is an effective treatment for GAD symptoms (Hanrahan et al., 2013), it remains less effective than other therapies (Hunot et al., 2010), and therefore the introduction targeted emotion regulation strategies could improve outcomes. Emotion Regulation Therapy (ERT; Mennin & Fresco, 2009) is still in its infancy, however has found some preliminary support (Mennin & Fresco, 2011) from a randomized clinical trial (RCT). Within the RCT (Mennin & Fresco, 2011), participants receiving ERT demonstrated statistically significantly greater reductions in GAD severity and worry, and increased quality of life, compared to participants receiving an attention control condition. Furthermore, these gains were maintained 9 months later. Future research however is needed to address the use of ERT as treatment for individuals with GAD.

The identification of resilience implicated in worry, as measured through PSWQ scores, has clinical implications, particularly in terms of the addition of Well-being Therapy (WBT; Fava, 1999) or other resilience training programs as an adjunct to the traditional use of CBT. The current research proposes a role for resilience, particularly in relation to worry, and therefore interventions targeting a reduction in worry symptoms and an increase in resilience, is likely to be beneficial to individuals with GAD. Research suggests resilience training programs have found

to be effective in increasing resilience in individuals (Fava et al., 2004), and thus improving well-being and quality of life (Leppin et al., 2014). In addition, this research has demonstrated that rumination plays a role within GAD symptomology and therefore this may be an important component to consider when providing psychological interventions for GAD.

#### **4.6 Future Research Directions**

Throughout the discussion references has been made to specific areas where future research is needed. Screening measures like the GAD-7, whilst clinically useful and valid, are not meant to be diagnostic tools. Future research involving participants with a GAD diagnosis would be useful in determining whether the findings of the current research translate to a clinical sample. In addition, the causal effect of emotion dysregulation and resilience on GAD have yet to be fully established, and therefore research utilising a prospective design are necessary to determine causal links.

In addition, the importance of utilising research that does not rely on retrospective, self-report measures is highly important. Concerns have been raised regarding the effectiveness of relying on self-report questionnaires as the sole measure of emotion dysregulation, given that research suggests individuals with GAD may lack awareness of emotions and have a poorer understanding of them. Given this, experimental designs that use observer ratings, or ability measures of emotion regulation would be beneficial.

Furthermore, whilst this research has provided some evidence as to the role of resilience in worry symptoms, particularly in terms of its predictive nature, this area is under-explored. Future research is necessary to further elucidate the exact



relationship between resilience and worry, and whether the relationship is specific to worry, or whether it is related to GAD symptomology as a whole.

#### **4.7 Conclusions**

This thesis aimed to further understanding regarding how emotion dysregulation was related to GAD, particularly through resilience. The roles of resilience and emotion dysregulation were examined in an analogue sample of participants classified in to a high GAD symptoms group ( $GAD \geq 10$ ) and low GAD symptoms group ( $GAD < 10$ ). Significantly lower resilience scores and higher emotion dysregulation scores were found in the high GAD symptoms group. Significant correlations were also found amongst these components suggesting the need to consider the role of resilience in GAD symptoms. Additionally, rumination, depression scores and maladaptive emotion regulation strategies were found to be predictive of GAD and of worry symptoms, with resilience also found to be a significant predictor, but for worry symptoms only (PSWQ scores). A mediation model was investigated and whilst a small indirect mediation effect was found, further research is needed to determine its significance. Given these findings, both training in emotion regulation strategies and resilience may help to improve outcomes of CBT for GAD, however further research is required to investigate the role of resilience in GAD, given the low correlation and mediation effect.

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## Appendices

### Appendix A. Generalised Anxiety Disorder 7-item Questionnaire (GAD-7)



The role of resilience and emotion regulation in worrying

#### Generalised Anxiety Disorder - 7

**Over the last 2 weeks, how often have you been bothered by the following problems?**

	Not at all	Several days	More than half the days	Nes
Feeling nervous, anxious or on edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Not being able to stop or control worrying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Worrying too much about different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Trouble relaxing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Being so restless that it is hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Becoming easily annoyed or irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Feeling afraid as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

5 / 13 38%

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Appendix B. Centre of Epidemiological Study Depression Scale (CES-D)

**CES-D**

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way in the past week.

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
I was bothered by things that usually don't bother me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not feel like eating (my appetite was poor)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I could not shake off the blues, even with help from my family or friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt I was just as good as other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble keeping my mind on what I was doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that everything I did was an effort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt hopeful about the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I thought my life had been a failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt fearful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My sleep was restless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I talked less than usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People were unfriendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoyed life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had crying spells	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that people dislike me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not get "going"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix C. Penn State Worry Questionnaire (PSWQ)


The role of resilience and emotion regulation in worrying
Exit

The Penn State Worry Questionnaire

**Please rate each of the following statements on a scale from 1 ("not at all typical of me") to 5 ("very typical of me"). Please do not leave any items blank.**

	1 (Not at all typical of me)	2	3	4	5 (Very typical of me)
If I do not have enough time to do everything, I do not worry about it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My worries overwhelm me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not tend to worry about things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Many situations make me worry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know I should not worry about things, but I just cannot help it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am under pressure I worry a lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am always worrying about something	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it easy to dismiss worrisome thoughts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As soon as I finish one task, I start to worry about everything else I have to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I never worry about anything	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When there is nothing more I can do about a concern, I do not worry about it any more	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have been a worrier all my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I notice that I have been worrying about things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Once I start worrying, I cannot stop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry all the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry about projects until they are all done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6 / 1346%

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Next



## Appendix D. Difficulties in Emotion Regulation Scale (DERS)

\* Please indicate how often the following statements apply to you by clicking the appropriate box on the scale below, beside each item.

	Almost never (0-10%)	Sometimes (11-35%)	About half the time (36-65%)	Most of the time (66-90%)	Almost always (91-100%)
I am clear about my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I pay attention to how I feel.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I experience my emotions as overwhelming and out of control.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have no idea how I am feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have difficulty making sense out of my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am attentive to my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know exactly how I am feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I care about what I am feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confused about how I feel.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I acknowledge my emotions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I become angry with myself for feeling that way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I become embarrassed for feeling that way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I have difficulty getting work done.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I become out of control.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I believe that I will remain that way for a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I believe that I'll end up feeling very depressed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I believe that my feelings are valid and important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I can still get things done.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I feel ashamed with myself for feeling that way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I know that I can find a way to eventually feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I feel like I am weak.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I feel like I can remain in control of my behaviours.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I feel guilty for feeling that way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I have difficulty concentrating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I have difficulty controlling my behaviours.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I believe that there is nothing I can do to make myself feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I become irritated with myself for feeling that way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I start to feel very bad about myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I believe that wallowing in it is all I can do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I lose control over my behaviours.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I have difficulty thinking about anything else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, I take time to figure out what I'm really feeling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, it takes me a long time to feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm upset, my emotions feel overwhelming.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix E. Cognitive Emotion Regulation Questionnaire (CERQ)

Emotion regulation

**\* Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. In the following questions, you are asked to indicate what you generally think when you experience negative or unpleasant events.**

	(Almost) never	Sometimes	Regularly	Often	(Almost) always
I feel that I am the one to blame for it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that I have to accept that this has happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often think about how I feel about what I have experienced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think of nicer things than what I have experienced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think of what I can do best	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I can learn something from the situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that it all could have been much worse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often think that what I have experienced is much worse than what others have experienced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that others are to blame for it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I am the one who is responsible for what has happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that I have to accept the situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am preoccupied with what I think and feel about what I have experienced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think of pleasant things that have nothing to do with it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think about how I can best cope with the situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that I can become a stronger person as a result of what has happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I keep thinking about how terrible it is what I have experienced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that others are responsible for what has happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think about the mistakes I have made in this matter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that I cannot change anything about it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to understand why I feel the way I do about what I have experienced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think of something nice instead of what has happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think about how to change the situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that the situation also has its positive sides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that it hasn't been too bad compared to other things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often think that what I have experienced is the worst that can happen to a person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think about the mistakes others have made in this matter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that basically the cause must lie within myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that I must learn to live with it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I dwell upon the feelings the situation has evoked in me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think about pleasant experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think about a plan of what I can do best	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I look for the positive sides to the matter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tell myself that there are worse things in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I continually think how horrible the situation has been	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that basically the cause lies with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix F. Ethical Approval

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Faculty of Medicine and Health Sciences Research Ethics Committee



Rebecca Webster  
Doctoral Course in Clinical Psychology (Dclinpsy)  
Postgraduate Research Office, Room 2.30  
Elizabeth Fry Building  
University of East Anglia  
Norwich Research Park  
NR4 7TJ

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West Office (Science Building)  
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Norwich Research Park  
Norwich, NR4 7TJ

Telephone: +44 (0) 1603 591720

Email: [fmh.ethics@uea.ac.uk](mailto:fmh.ethics@uea.ac.uk)

Web: [www.uea.ac.uk/researchandenterprise](http://www.uea.ac.uk/researchandenterprise)

6<sup>th</sup> October 2014

Dear Rebecca

**Project Title: Does resilience mediate the relationship between emotion dysregulation and Generalised Anxiety Disorder in adults? Reference: 2013/2014 – 49**

Thank you for your e-mail dated 02.10.14 notifying us of the amendments you would like to make to your above proposal. These have been considered by the Chair of the Faculty Research Ethics Committee and we can now confirm that your amendments have been approved.

Please can you ensure that any further amendments to either the protocol or documents submitted are notified to us in advance, and also that any adverse events which occur during your project are reported to the Committee.

Please can you also arrange to send us a report once your project is completed.

Yours sincerely,

A handwritten signature in blue ink that reads 'Yvonne Kirkham'. The signature is written in a cursive style.

Yvonne Kirkham  
Project Officer

cc Professor Kenneth Laidlaw

## Appendix G. Participant Information Sheet

### Information about this research

#### Will my answers be anonymous?

All the information you give is anonymous and you are not required to give any personal information about yourself. This also means we cannot give individual feedback on your answers. If you wish to enter the prize draw or receive feedback about the overall results of the research then you will be asked to provide your email address. Your email address will be kept confidentially and securely in a separate database and will not be linked to your answers.

#### What are the possible benefits of me taking part?

We cannot promise that the research will help you directly but by taking part you will be contributing to research looking to better understand anxiety which will enable the improvement of psychological interventions.

#### What are the possible disadvantages of me taking part?

The potential disadvantages are that it takes approximately 30 minutes to complete and that it may involve answering questions that may be distressing for some.

#### What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher (contact details below) who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this by contacting Dr. Sian Coker, School Director of Research at the University of East Anglia by email ([s.coker@uea.ac.uk](mailto:s.coker@uea.ac.uk)) or by writing to Dr. Sian Coker, Doctorate of Clinical Psychology Course, Department of Psychological Sciences, Faculty of Medicine and Health Sciences, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ.

#### How do I withdraw?

During the completion of questionnaires, you are able to withdraw your consent at any point by clicking on the "exit" button on each page or by exiting the internet page. You will be asked to create a personal identification code which you will be able to use if you later would like to withdraw your answers. You will be able to withdraw at any point during the study and up to 2 weeks after you have completed the questionnaires.

#### What will happen to the results of the research?

The results of the research will contribute to a Doctoral thesis in Clinical Psychology at the University of East Anglia. The results may also be published in a professional journal. No identifiable information will be published. Data will be analyzed as a whole group and so no individual's responses will be reported. If you would like to receive feedback about the overall results of the research, then there will be the opportunity for you to provide your email address at the end of the research. Further information about the study and what has been found will then be emailed to you when it becomes available.

The research is funded by the University of East Anglia. This research has been reviewed by staff at the University of East Anglia and has been granted permission by the FMH research ethics committee.

#### Contact details

If you have any questions, queries or problems, please contact me on:


Name of Researcher: Rebecca Webster

Email address: [r.webster@uea.ac.uk](mailto:r.webster@uea.ac.uk)

Telephone number: 07508 288308

Many thanks for your time.

## Appendix H. Participant Debrief Sheet



The role of resilience and emotion regulation in worrying Exit

**You have finished!**

Thank you for taking part in this study!

This research looked at the role that emotion regulation (i.e. the ability to experience, respond and manage a range of emotions) plays in symptoms of Generalised Anxiety Disorder. It also looked at whether a person's resilience affects this. Resilience is a term used to describe the ability to "bounce back" and recover from difficult life events or situations.

We anticipate that people who are high in emotion regulation, that is they are able to understand, manage and express their emotions, will show higher levels of resilience. We also expect that they will also have lower levels of generalised anxiety (worry). The results of this research will help us understand more about generalised anxiety and the factors that contribute to it. It will also contribute to improve interventions and treatment for people with Generalised Anxiety Disorder.

If you feel distressed as a result of this research we encourage you to contact your family doctor or a health professional. You can also access support and information by contacting mental health charities such as MIND (Website: [www.mind.org.uk](http://www.mind.org.uk); Telephone: 0300 123 3393) or the Samaritans (Website: [www.samaritans.org](http://www.samaritans.org); Telephone: 08457 90 90 90 (UK). The NHS website also provides advice about stress, anxiety and depression that may be useful for you (<http://www.nhs.uk/conditions/stress-anxiety-depression/Pages/low-mood-stress-anxiety.aspx>). On the NHS website there are also links to other external agencies and groups that you can contact.

If you would like to enter the prize draw for 4x£20 Amazon vouchers or would like to find out the results of the research, then please go to the next page where you can enter your email address. Your email address will not be linked to your answers and will be destroyed once the details of the research are sent out to you when available.

Thank you again for your help.

Rebecca

11 / 13 85%

Prev Next

Appendix I. Histograms to observe normal distribution

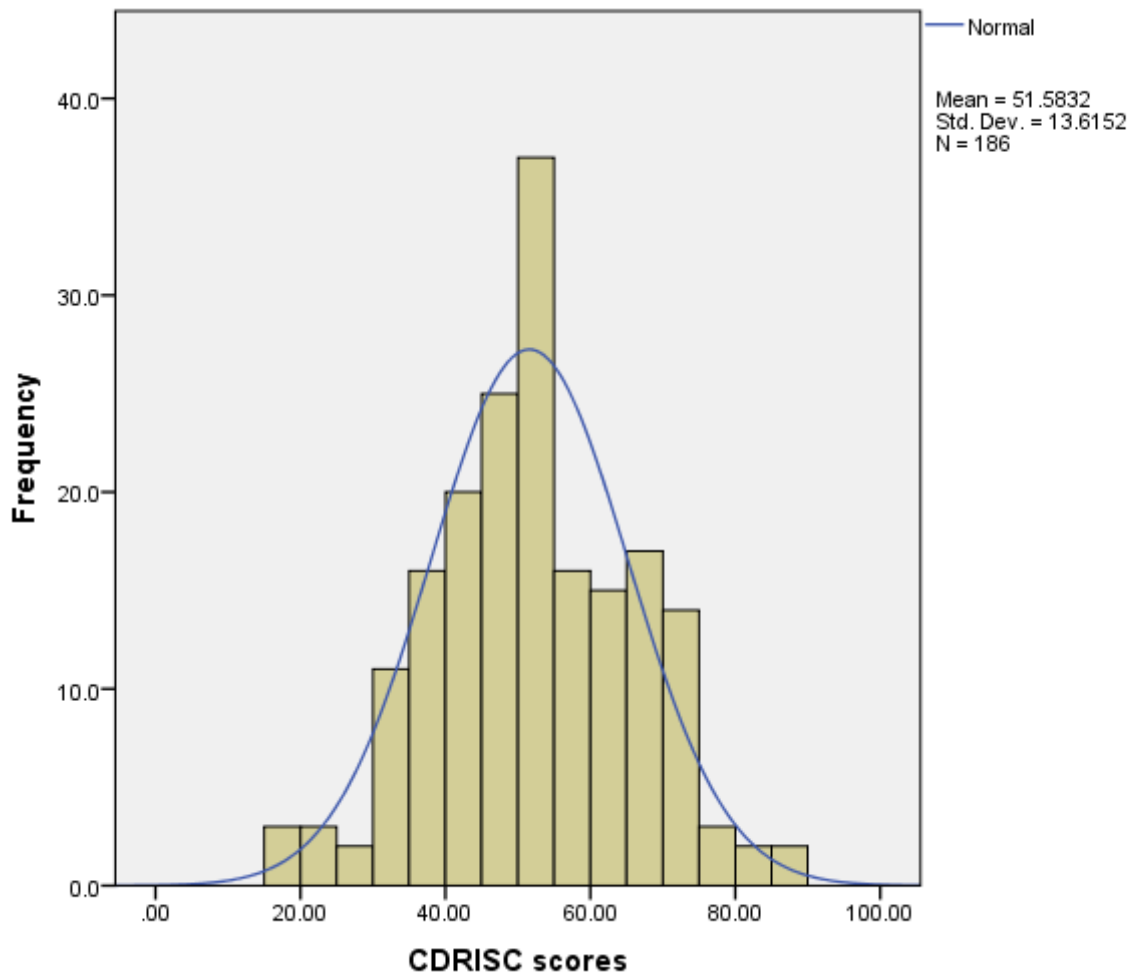


Figure II. Histogram of resilience scores.

Note. CDRISC = Connor-Davidson Resilience Scale

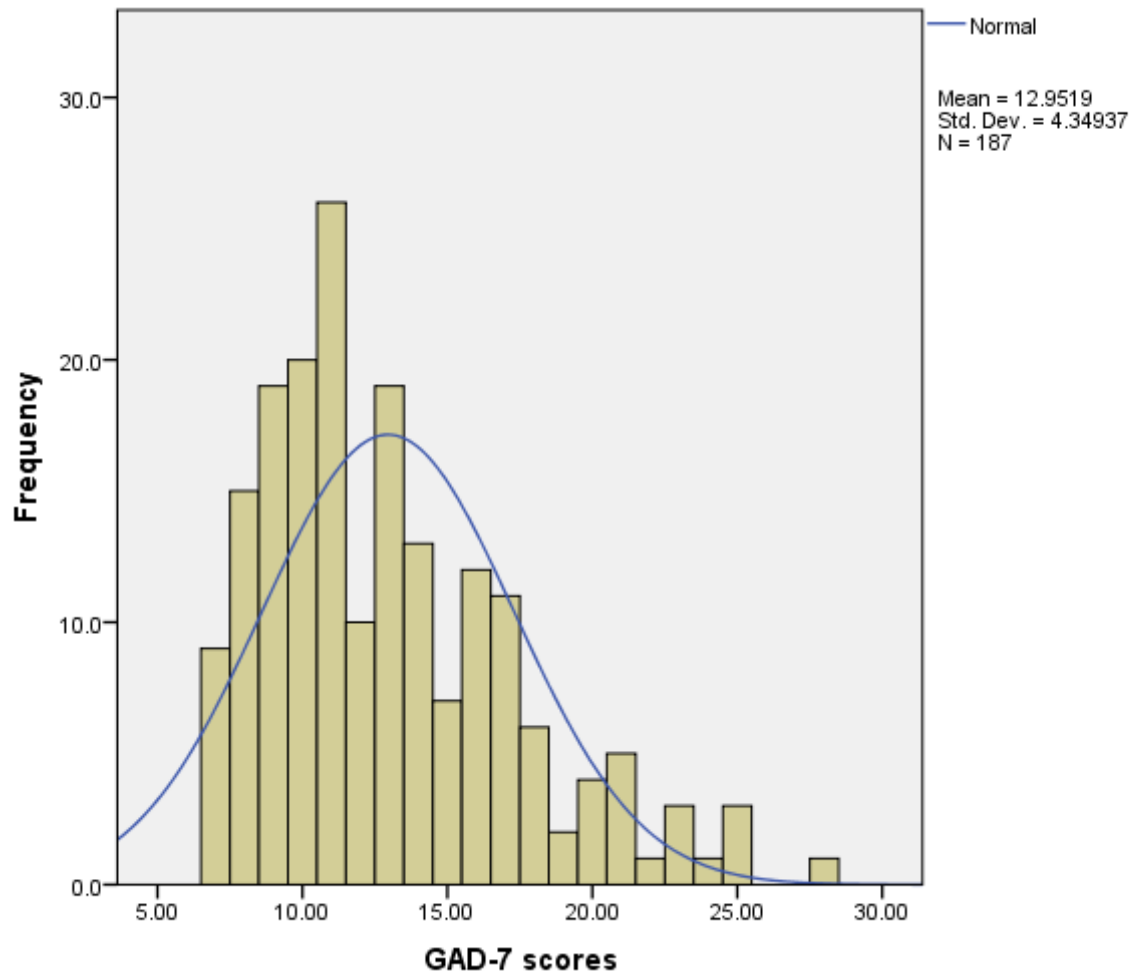


Figure I2. Histogram of GAD scores.

Note. GAD-7 = Generalized Anxiety Disorder 7-item Questionnaire



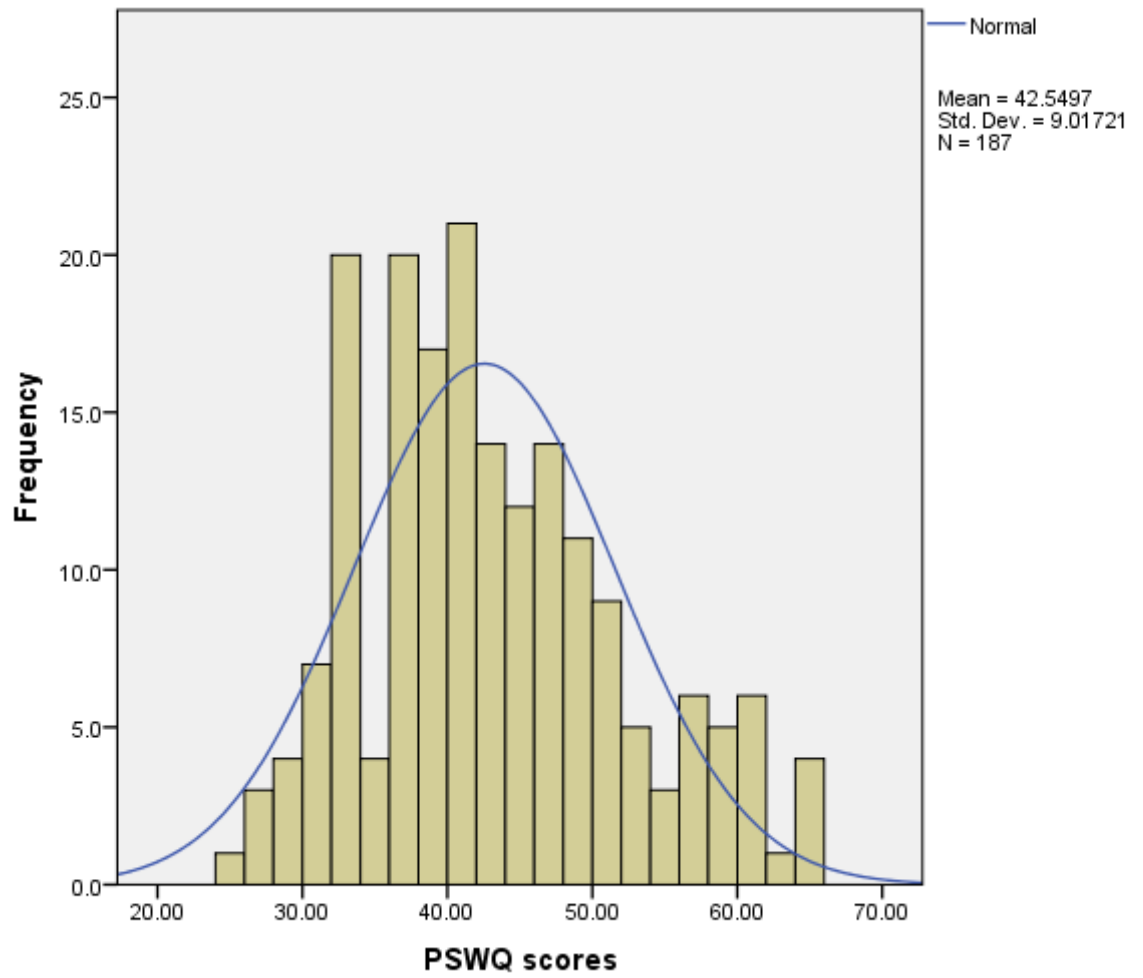


Figure 13. Histogram for worry scores.

Note. PSWQ = Penn State Worry Questionnaire.

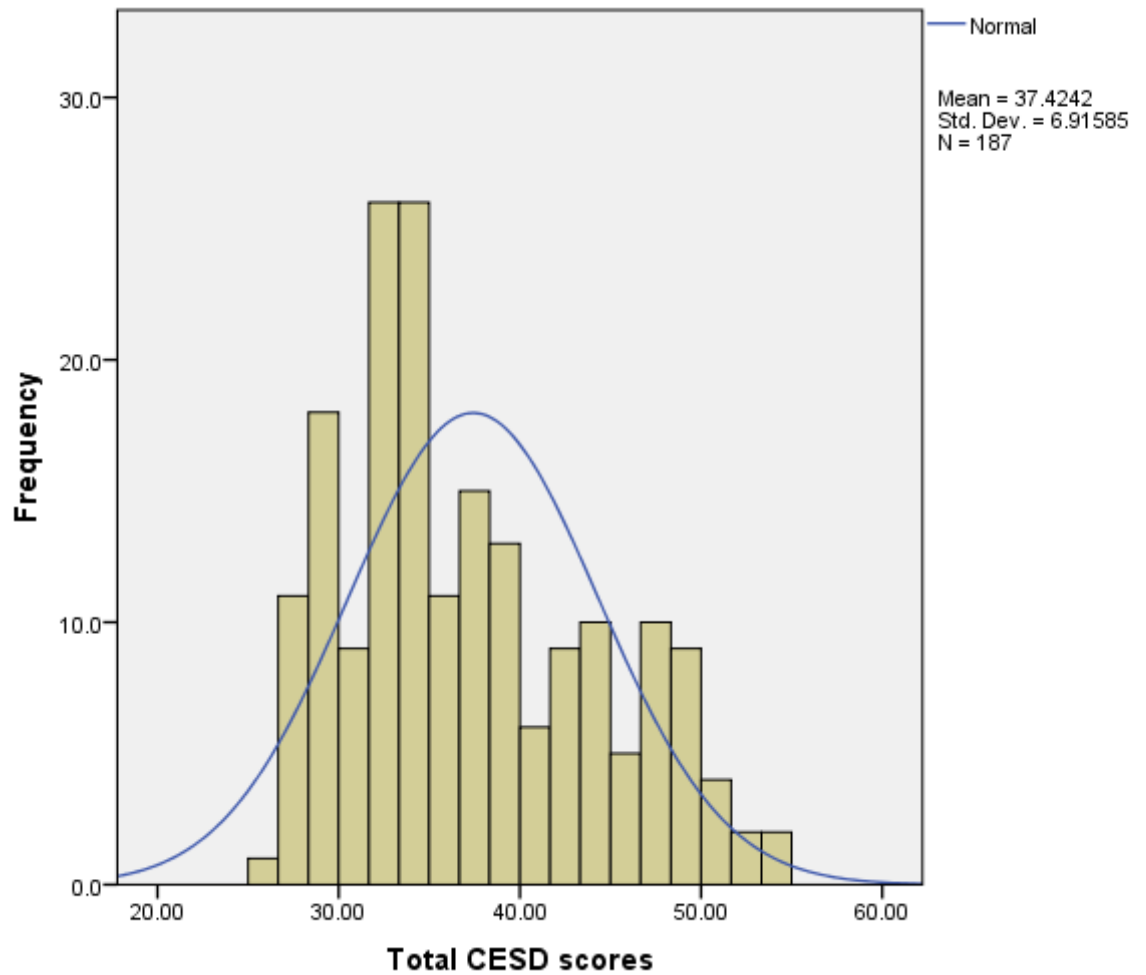


Figure I4. Histogram of depression scores.

Note. CESD = Centre for Epidemiologic Studies Depression Scale.

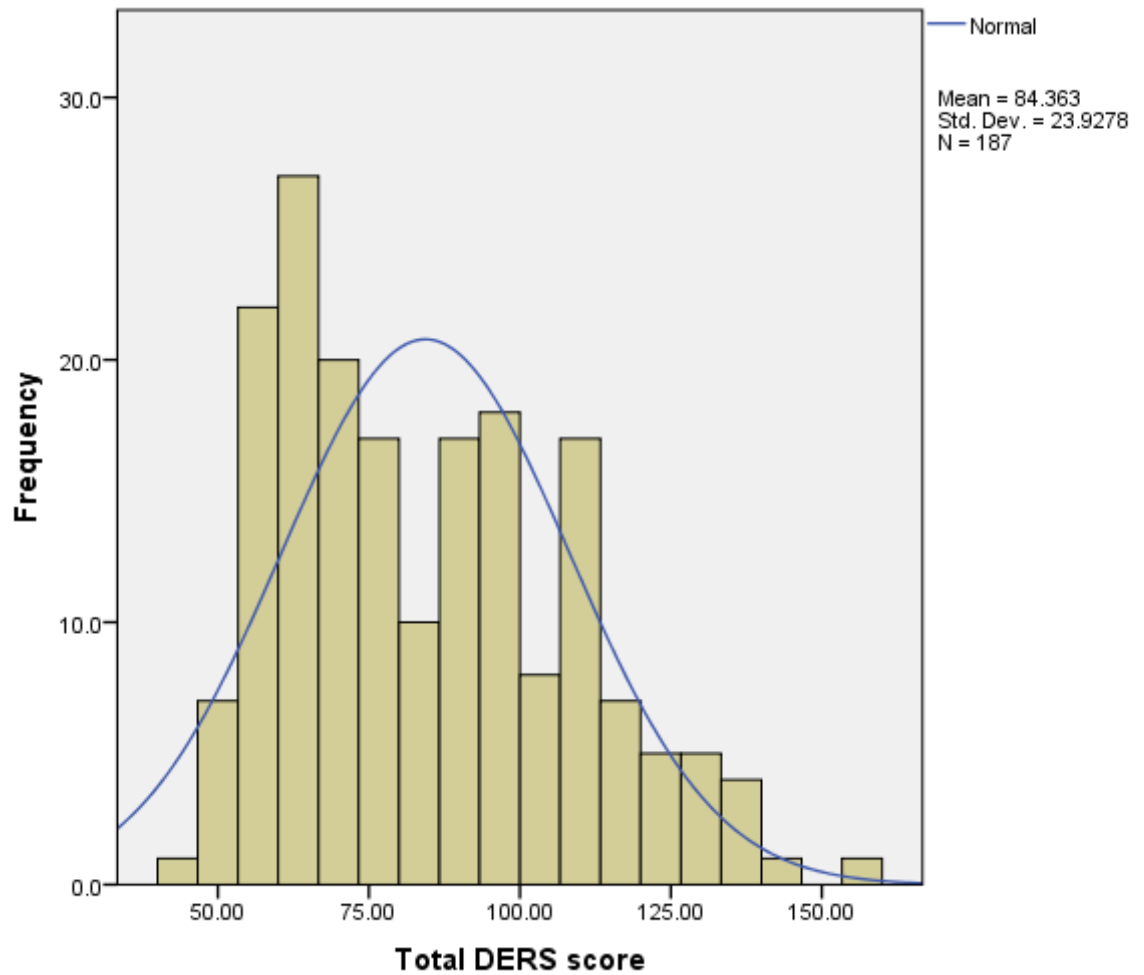


Figure 15. Histogram of total emotion dysregulation scores.

Note. DERS = Difficulties in Emotion Regulation Scale.

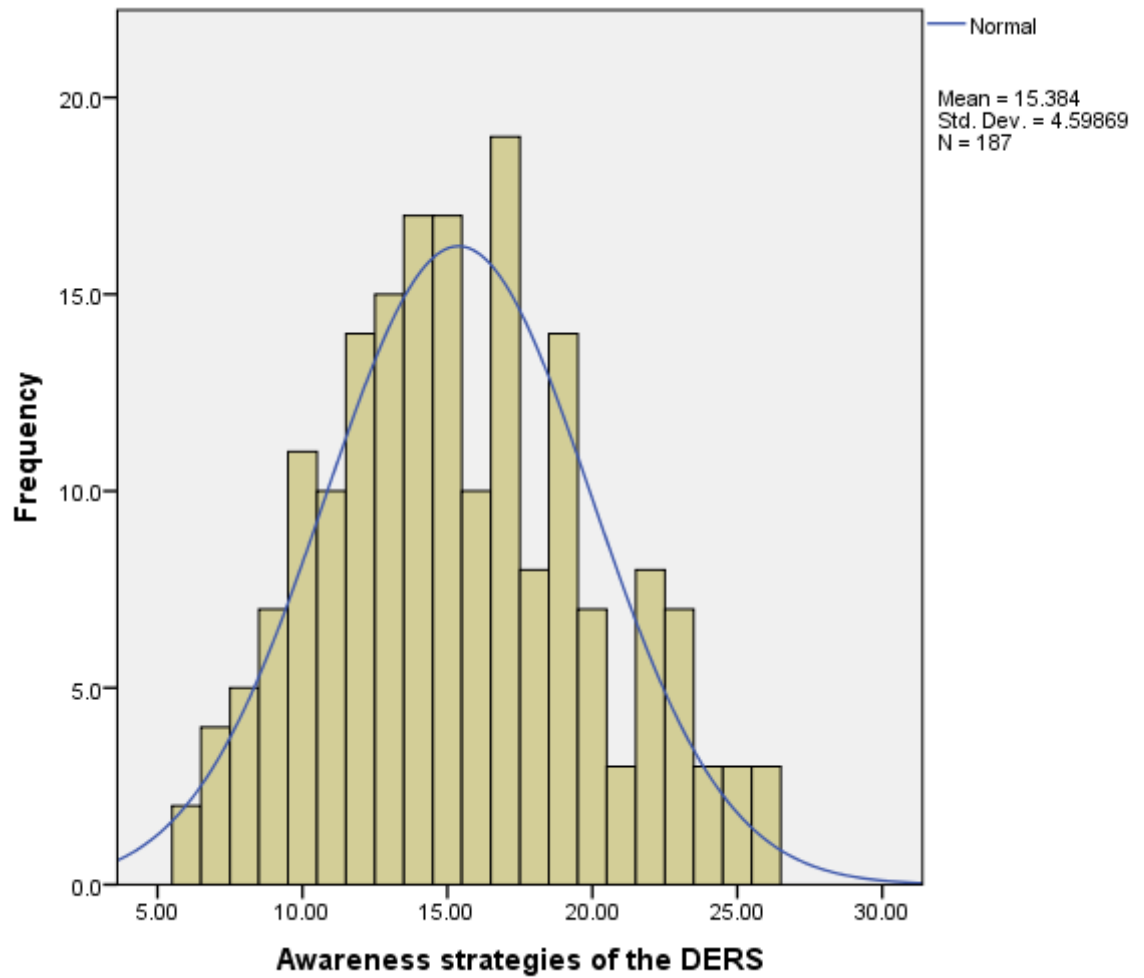


Figure 16. Histogram of the awareness subscale of the DERS.

Note. DERS = Difficulties in Emotion Regulation Scale.

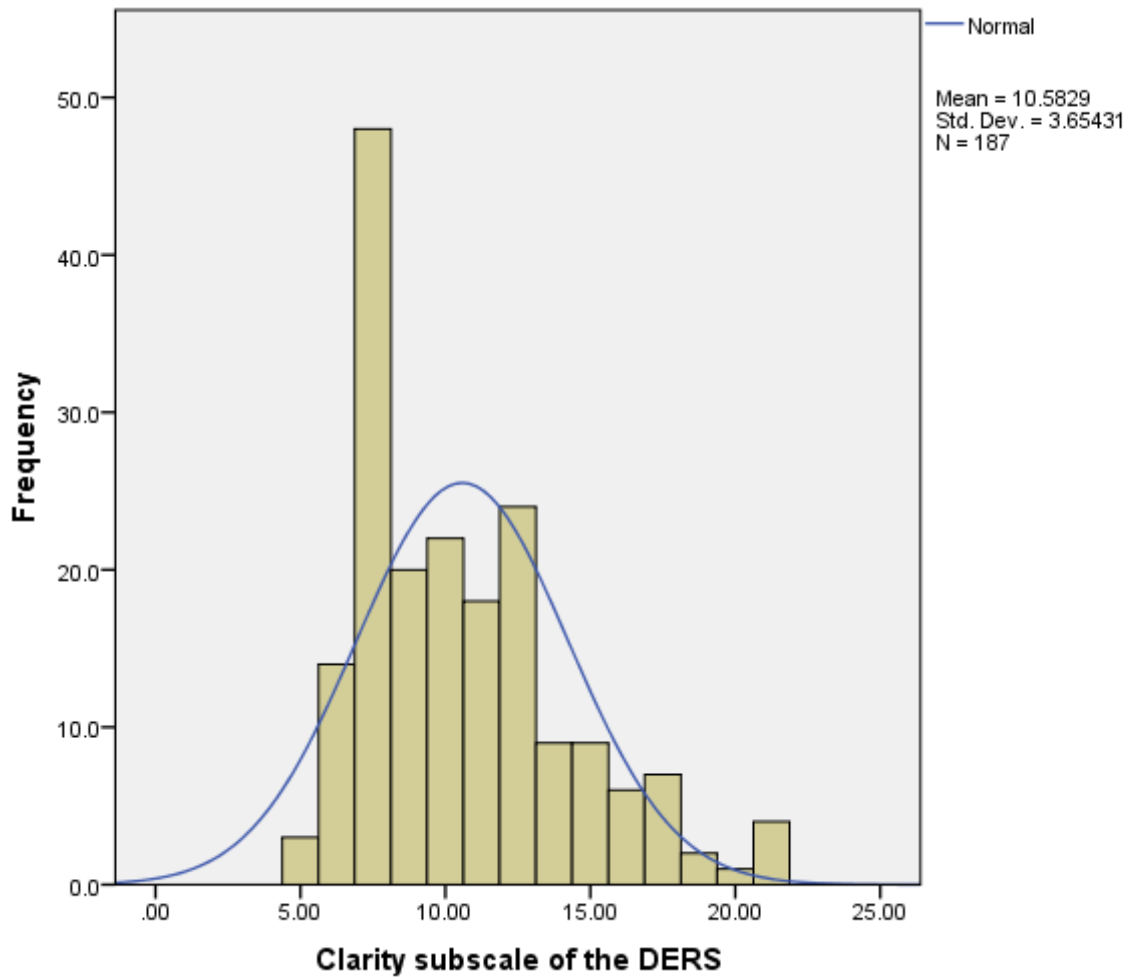


Figure 17. Histogram of the clarity subscale of the DERS.

Note. DERS = Difficulties in Emotion Regulation Scale.

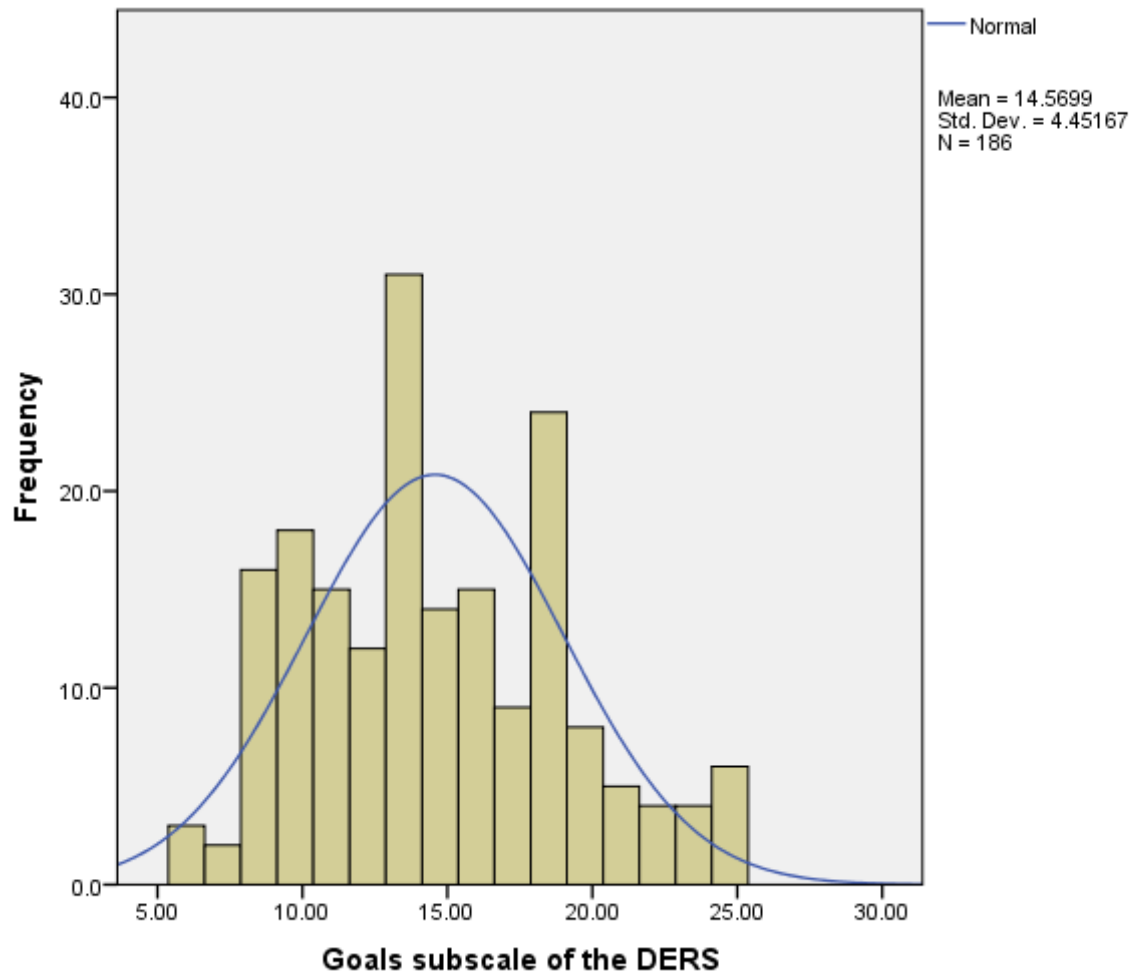


Figure 18. Histogram of the goals subscale of the DERS.

Note. DERS = Difficulties in Emotion Regulation Scale.

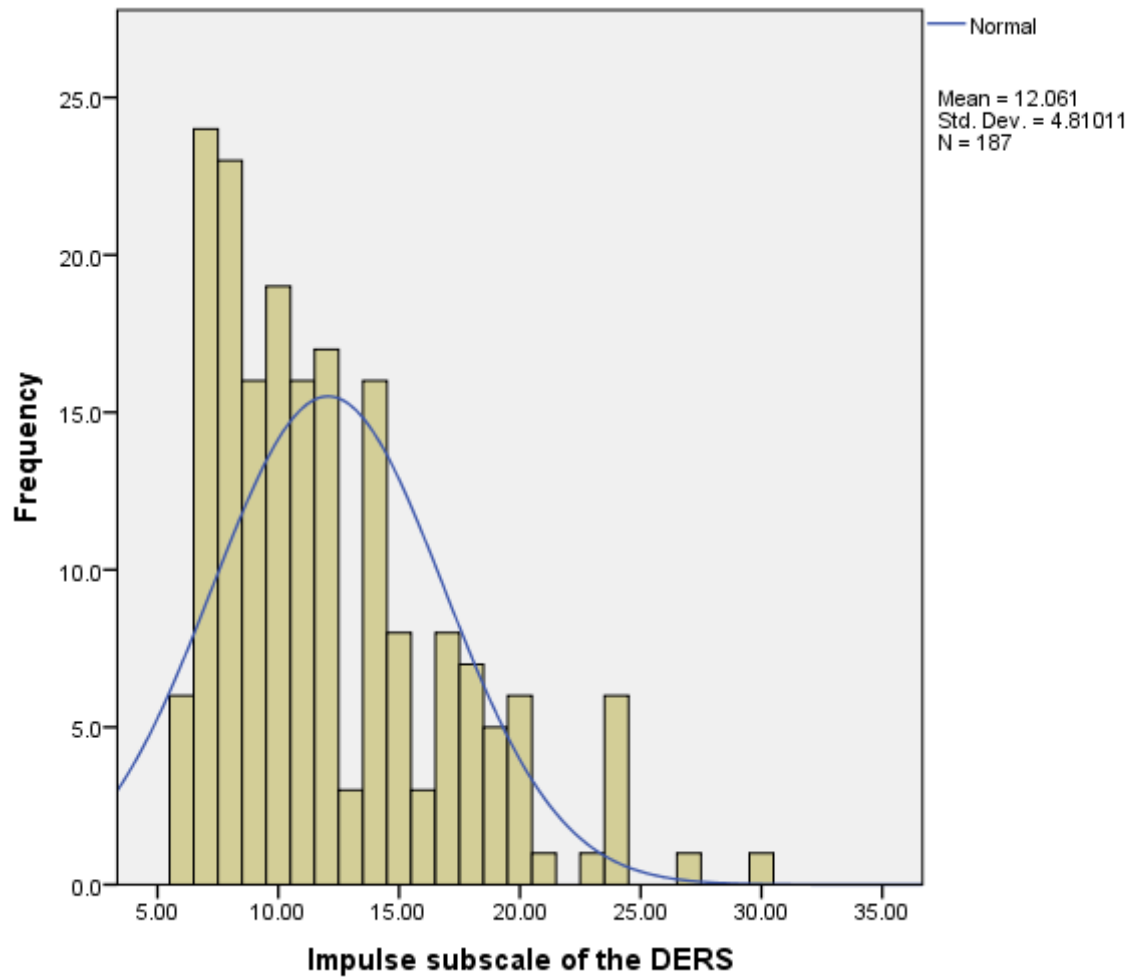


Figure 19. Histogram of the impulse subscale of the DERS.

Note. DERS = Difficulties in Emotion Regulation Scale.

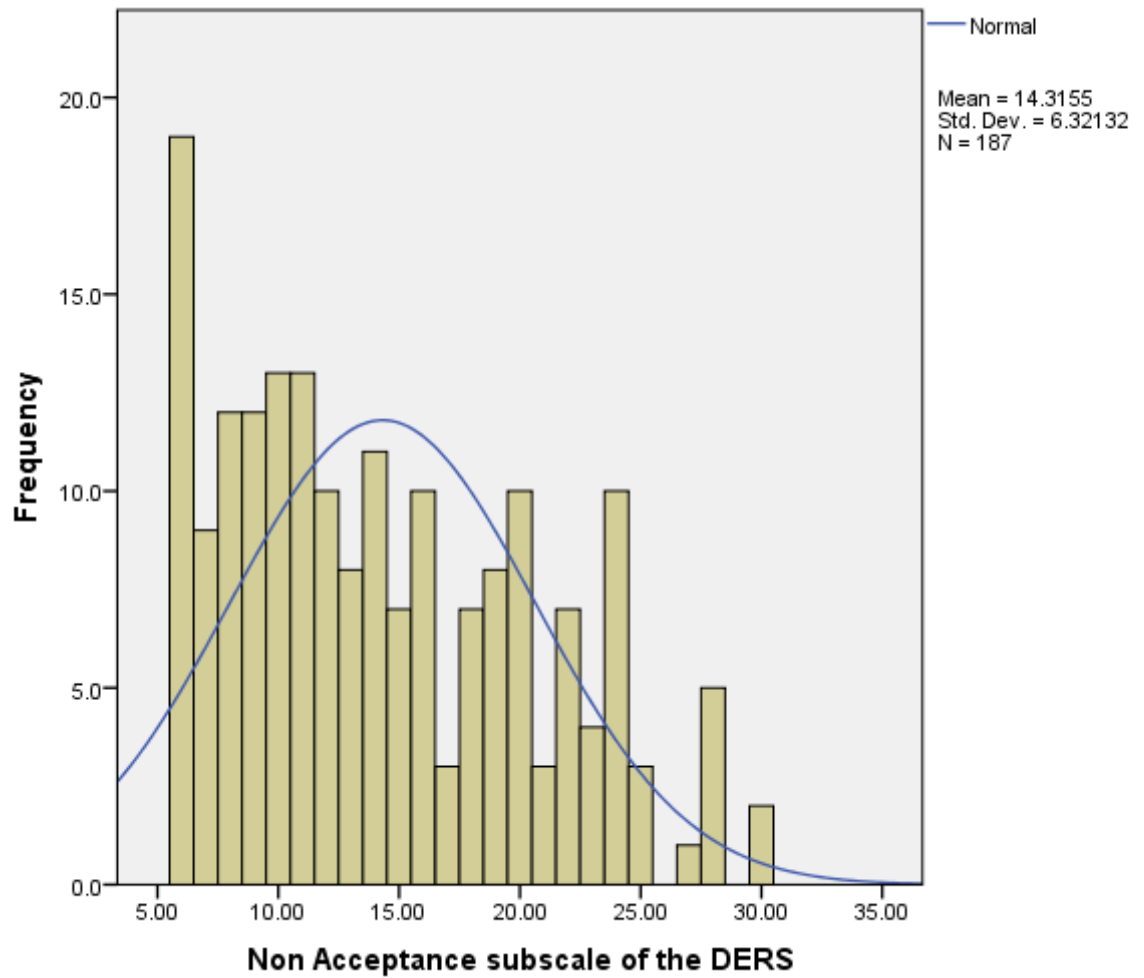


Figure 110. Histogram of the non-acceptance subscale of the DERS.

Note. DERS = Difficulties in Emotion Regulation Scale.



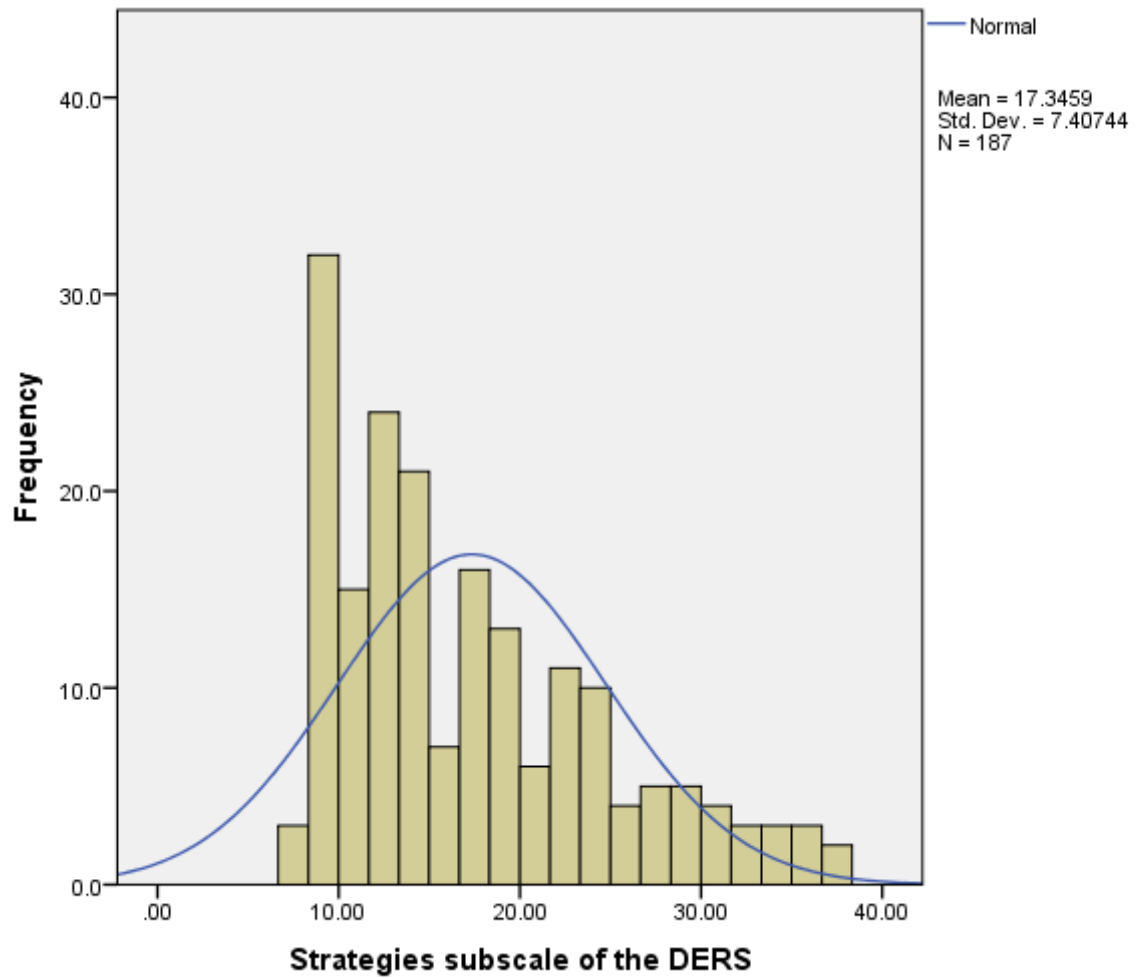


Figure III. Histogram of the strategies subscale of the DERS.

Note. DERS = Difficulties in Emotion Regulation Scale.

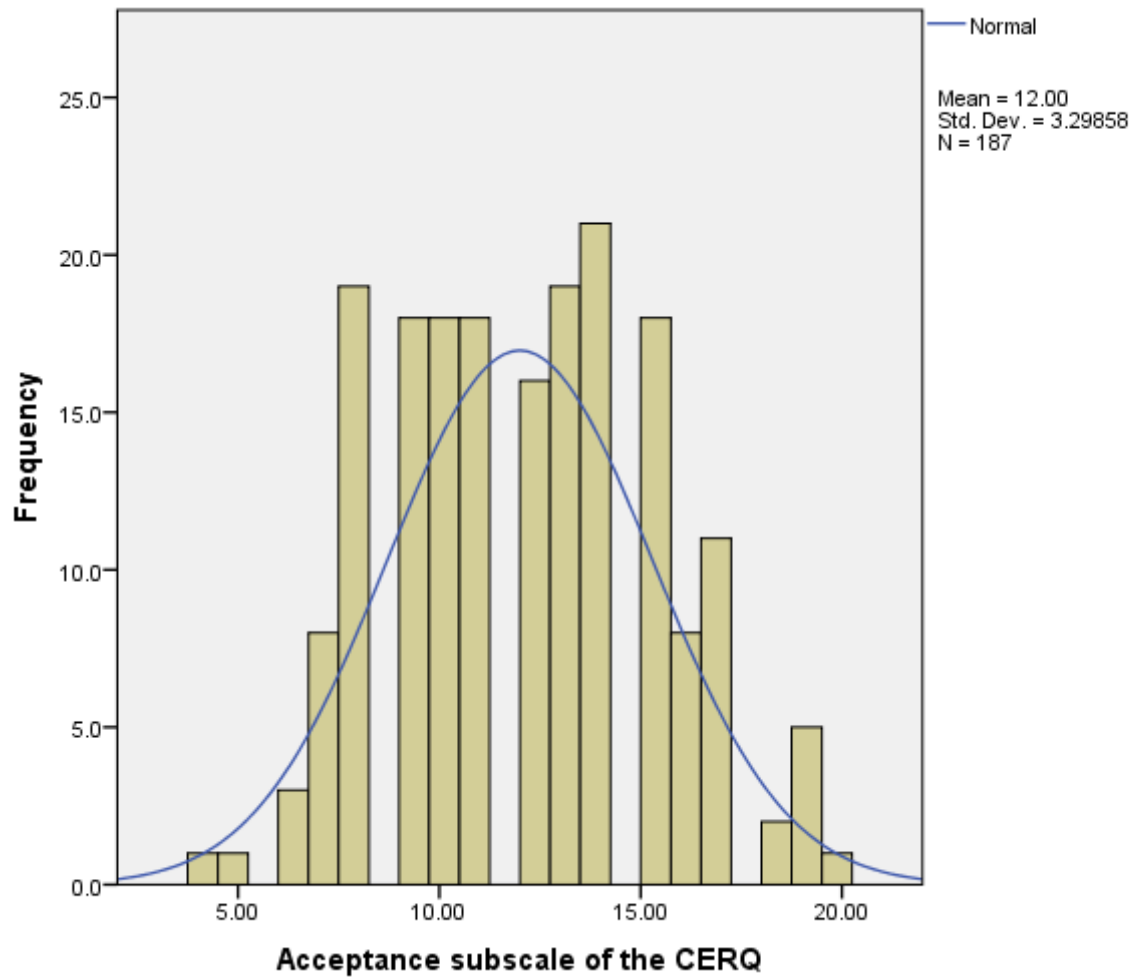


Figure 112. Histogram of the acceptance subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

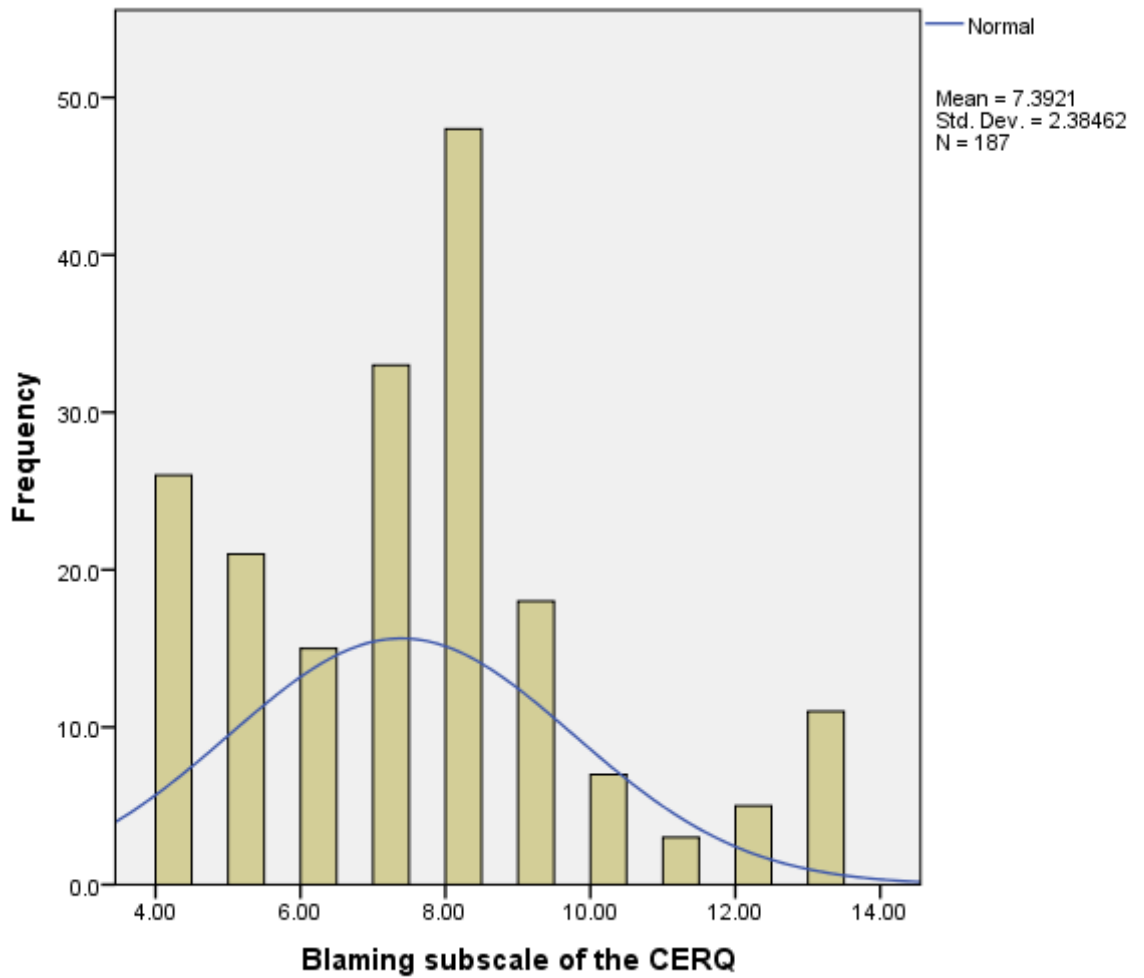


Figure 113. Histogram of the blaming others subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

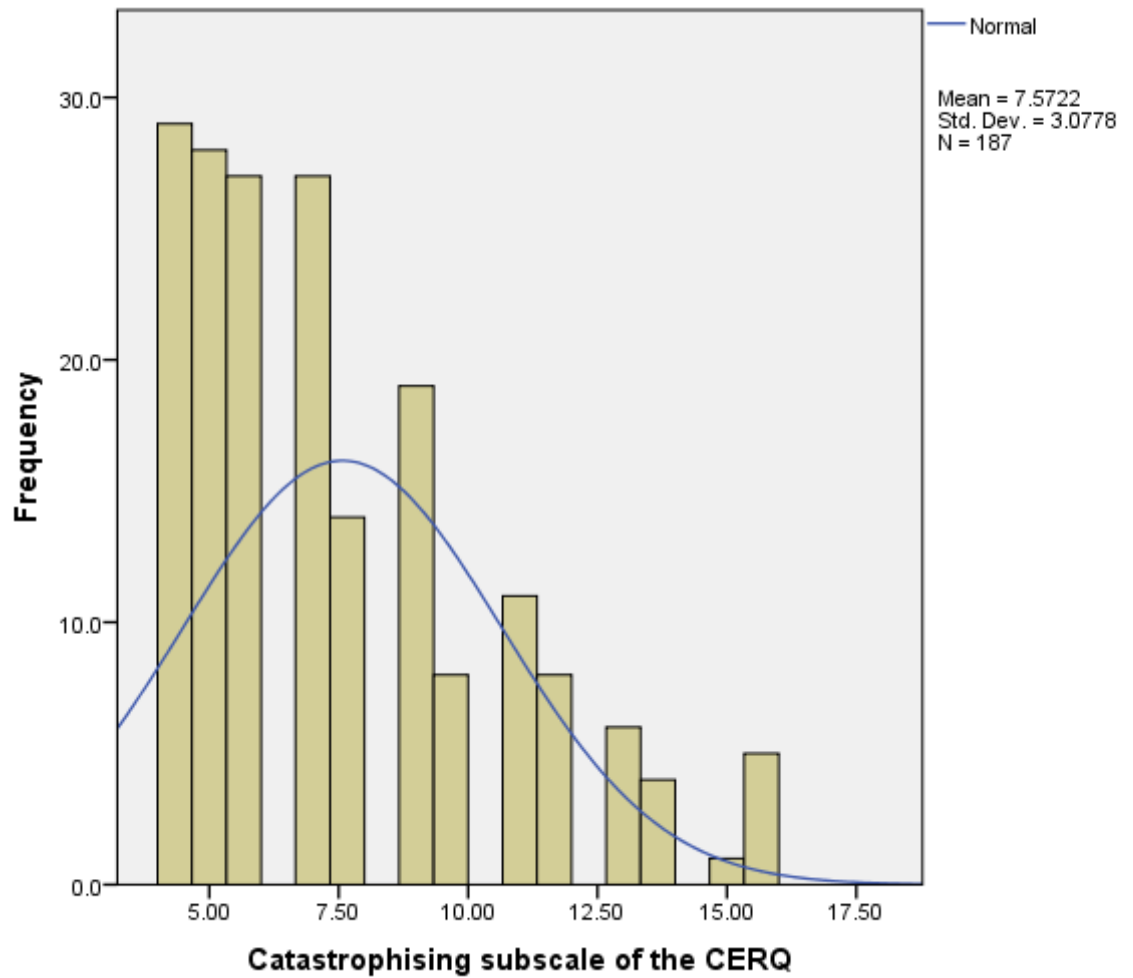


Figure 114. Histogram of the catastrophising subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

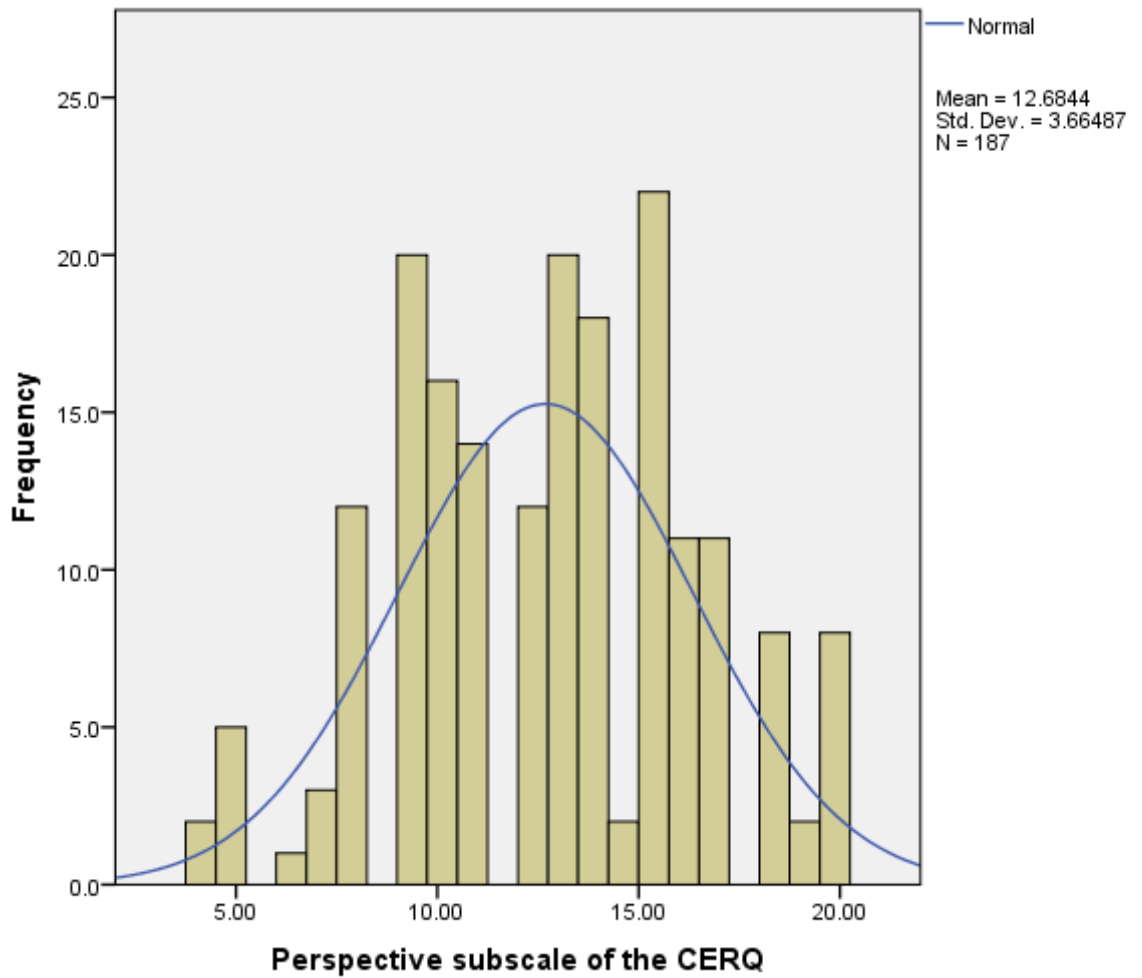


Figure I15. Histogram of perspective subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

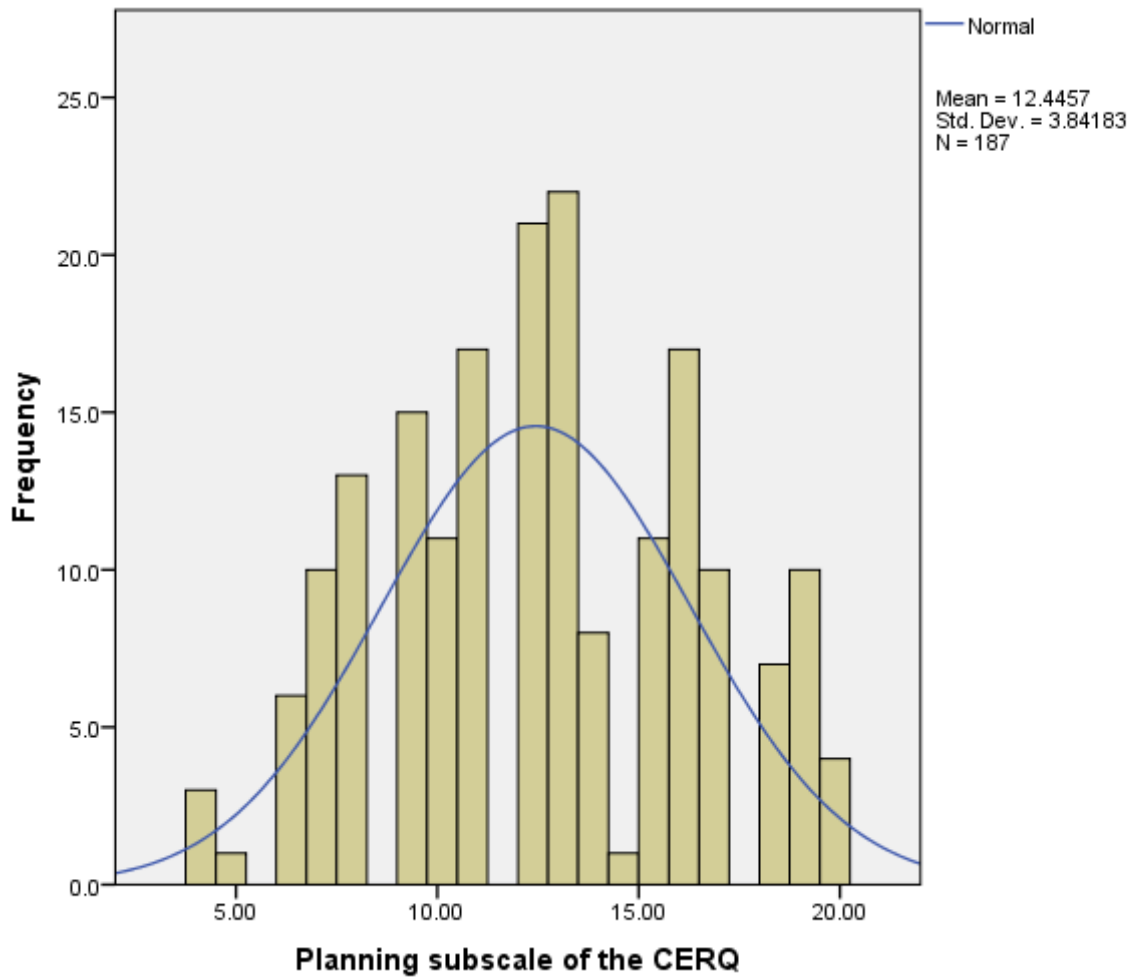


Figure I16. Histogram of the refocusing on planning subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

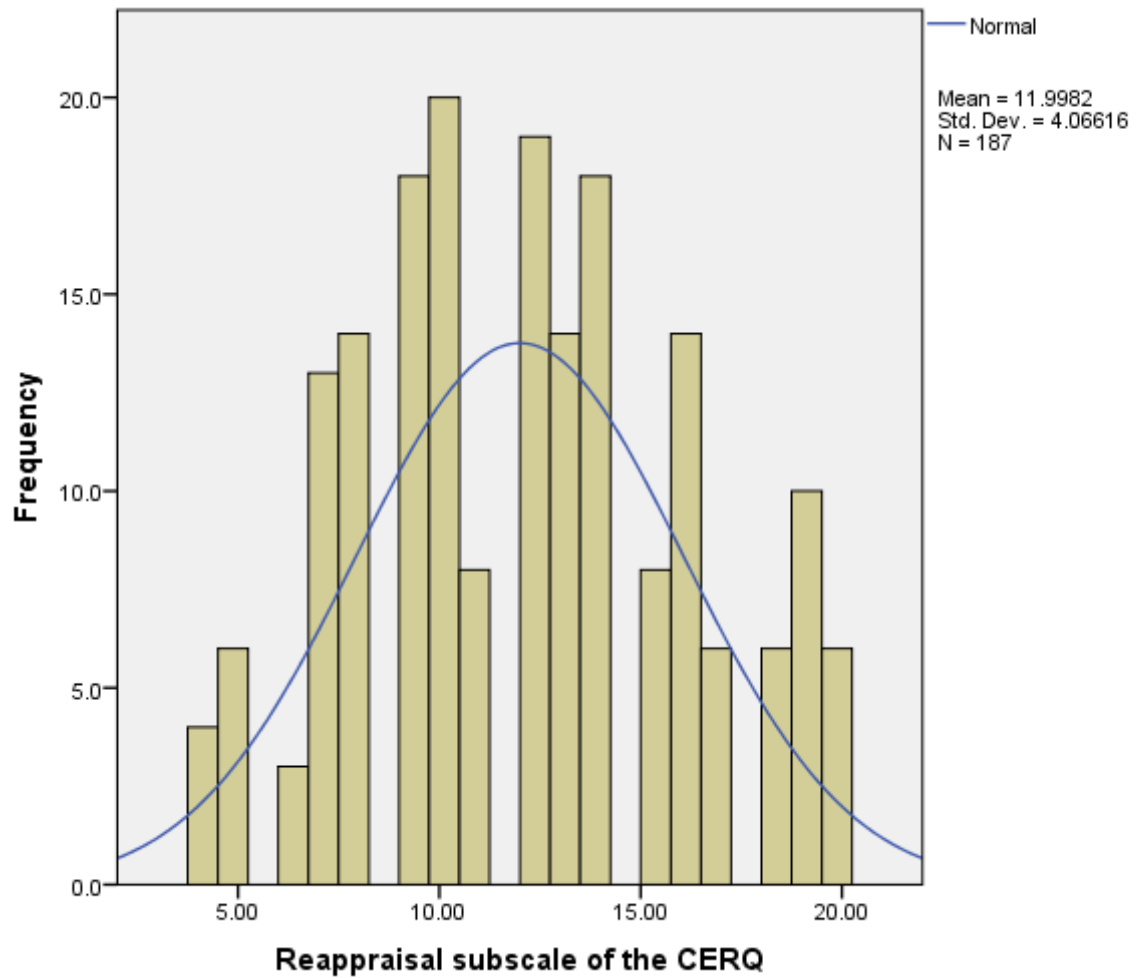


Figure 117. Histogram of the positive reappraisal subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

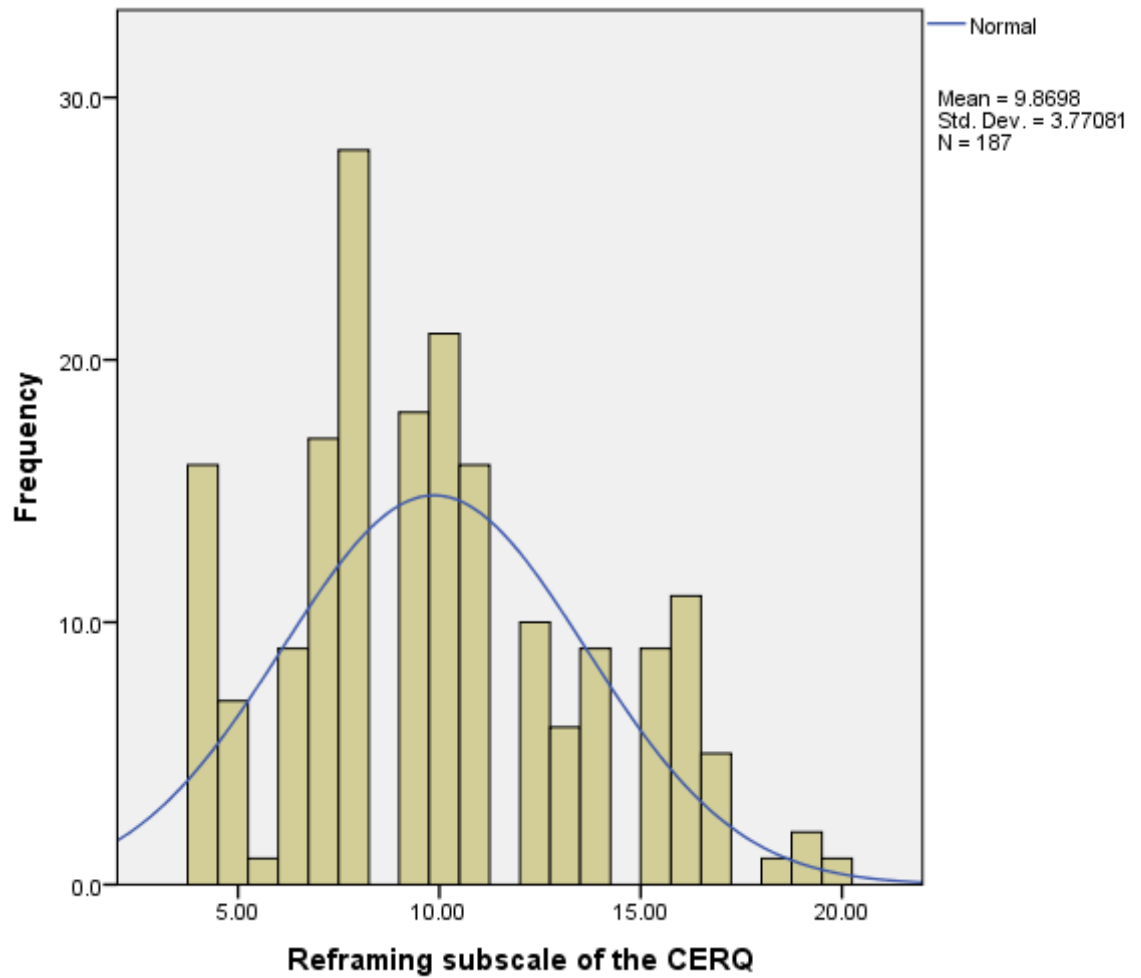


Figure 118. Histogram of the positive reframing subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.



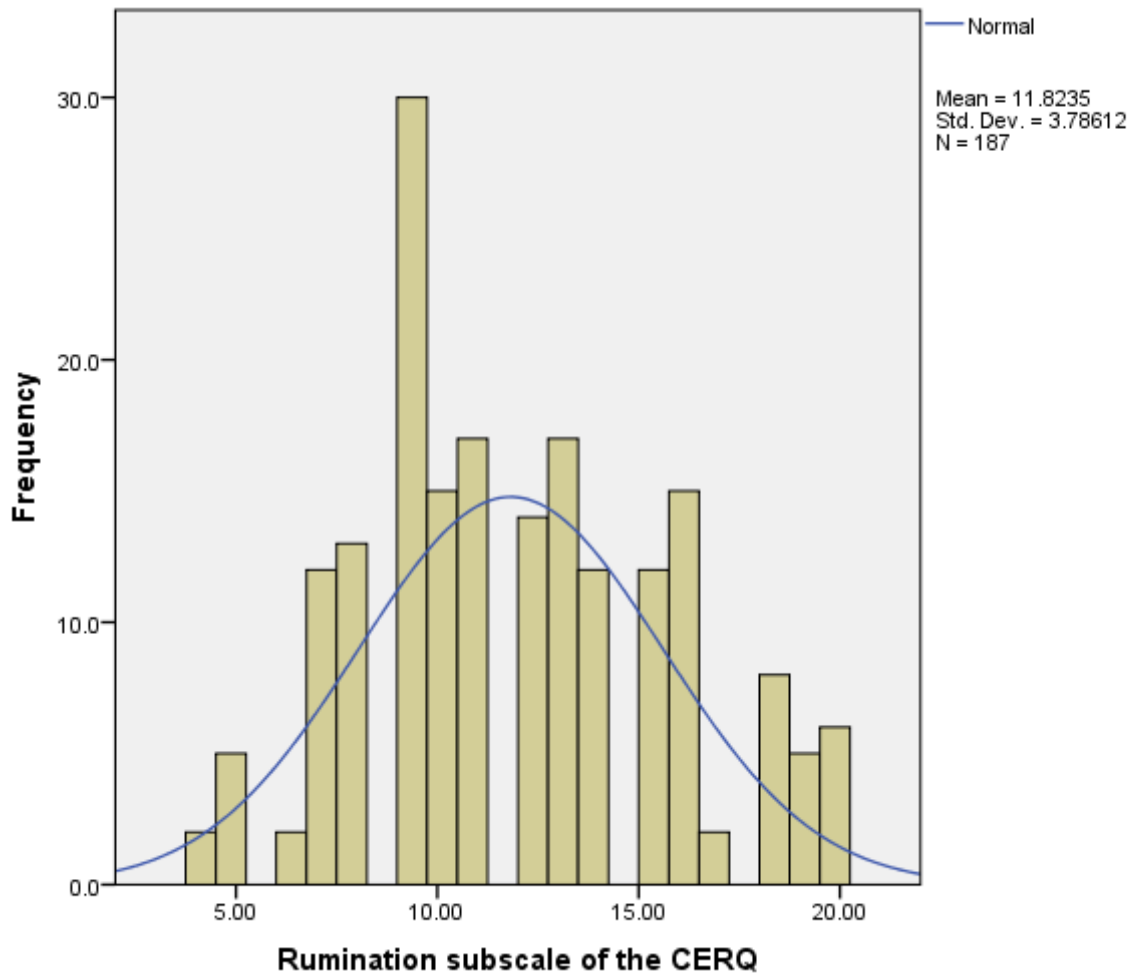


Figure I19. Histogram of the rumination subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.

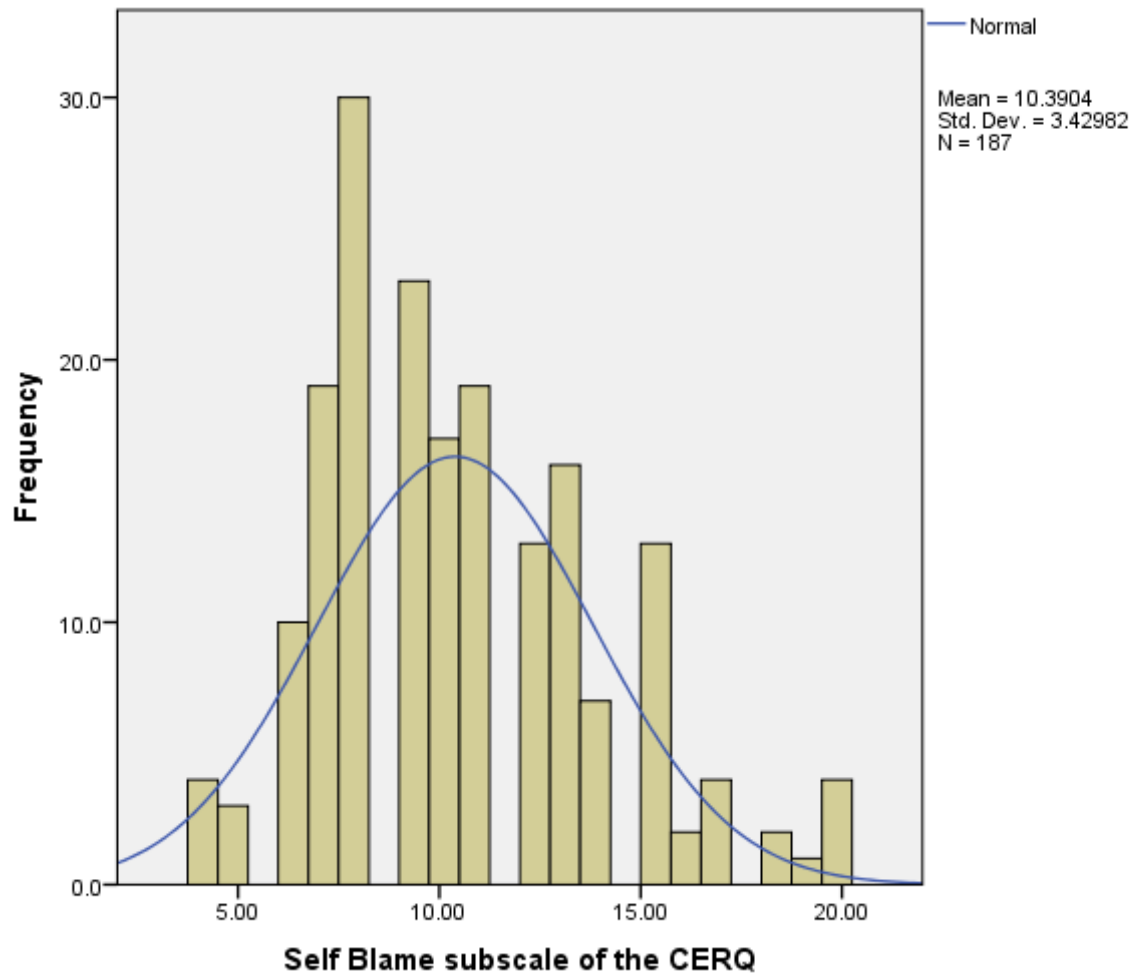


Figure I20. Histogram of the self-blame subscale of the CERQ.

Note. CERQ = Cognitive Emotion Regulation Questionnaire.