

**Feeling Sad, Angry, or Scared: An Investigation of Gender Differences in the Regulation of Specific Emotions, and their Relationship with Variables Associated with Mental Health**

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## **Author's Declaration**

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Signed: *M. Patrick*

Date: 30<sup>th</sup> September 2021

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## List of Abbreviations

Abbreviation	Explanation
ABM	Attentional Bias Modification
Ad	Adults
ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
ANS	Autonomic Nervous System
BERQ	Behavioural Emotion Regulation Questionnaire
CBT	Cognitive Behavioural Therapy
CERQ	Cognitive Emotion Regulation Questionnaire
CES-D	Centre for Epidemiological Studies Depression Scale
CI	Confidence Interval
DBT	Dialectical Behavioural Therapy
DERS	Difficulties in Emotion Regulation Scale
DSHI	Deliberate Self-Harm Inventory
DV	Dependent Variable
EEG	Electroencephalography
EPM	Extended Process Model of Emotion Regulation
ER	Emotion Regulation
ERI	Emotion Regulation Inventory
EROS	Emotion Regulation of Others and Self Scale
ERP	Event-Related Potential
ERQ	Emotion Regulation Questionnaire
ERT	Emotion Regulation Task
fEMG	Facial Electromyography
fMRI	Functional Magnetic Resonance Imaging
HC3	Heteroscedastic-Consistent Standard Error Estimator
IAPS	International Affective Picture System
IV	Independent Variable
LLP	Late Positive Potential
MCSDS	Marlowe-Crowne Social Desirability Scale
MIP	Mood Induction Procedure
NAPS	Nencki Affective Picture System
NERI	Negative Emotion Regulation Inventory
NSSI	Non-Suicidal Self Injury
OA	Older Adolescents
OR	Odds Ratio
PAQ	Personal Attributes Questionnaire
REQ	Regulation of Emotions Questionnaire
RQ	Research Question
RRS	Ruminative Response Scale
RST	Response Styles Theory
SD	Social Desirability
SES	Socioeconomic Status
SIDAS	Suicidal Ideation Attributes Scale
WEMWBS	Warwick-Edinburgh Mental Well-Being Scale
YA	Younger Adolescents

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## Abstract

Gender differences in the regulation of sadness, anger, and fear, and their relationship with variables associated with mental health, were examined in the present research. Emotion regulation (ER) refers to the different ways that we manage our emotions, and ER has an important impact on many areas of life, including mental health. The majority of research in the field of ER has focused on general affective states, such as negative emotion, stress, or mood. Consequently, it is unclear if ER, and gender differences in ER, differs according to the specific emotion being regulated, such as sadness, anger, or fear.

It is important to investigate gender differences in ER in an emotion-specific manner because there is evidence that males and females are socialised to respond to their emotions in different ways, which may impact how they regulate their emotions. Also, there are prominent gender differences in some variables that are associated with mental health. However, the relationship between gender, ER, and mental health has not been examined in an emotion-specific manner so far. This is problematic, because there is evidence that the relationship between ER and mental health may depend on the specific emotion being regulated.

The aims of the present research were (1) to examine if there are gender differences in the regulation of three specific emotions – sadness, anger, and fear, and (2) to investigate if gender differences in the regulation of sadness, anger, and fear are related to gender differences in variables associated with mental health.

These aims were achieved by conducting two empirical studies. In Study 1, participants completed open-ended questionnaires which asked about the regulation of specific emotions. The responses from these questionnaires were coded into ER strategies to examine the relationship between gender and the use of these strategies to regulate specific emotions. In Study 2, participants completed an Emotion Regulation Task (ERT) which

involved looking at emotional pictures and using ER strategies to regulate the specific emotions that arose. Participants also completed self-report questionnaires measuring variables associated with mental health.

Gender differences in ER were found, but these often depended on the specific emotion being regulated and the ER strategy being used. Also, ER partly explained some of the gender differences in variables associated with mental health, but again, this depended on the specific emotion being regulated, and the ER strategy.

These findings have important implications for theory, because they highlight the lack of a theoretical framework for understanding the regulation of specific emotions. However, it is proposed that existing models can be easily altered to accommodate this emotion-specific paradigm. These findings also have important implications for therapeutic practice, because they show that the emotional context and gender of the individual may impact the use and effectiveness of ER strategies. This may guide tailoring therapeutic interventions such as ER training to the specific emotional context, which may help to increase treatment success.

Overall, the findings of this research highlight the importance of investigating ER in an emotion-specific manner. The key message from this research is that what is known about the regulation of one emotion cannot necessarily be applied to all emotions or negative emotion in general. Therefore, it may be helpful to examine ER in an emotion-specific manner moving forward.

## **Chapter 1: Emotions and Emotion Regulation**

### **1.1. Chapter Summary**

In this chapter, the theoretical literature on emotion and emotion regulation (ER) will be discussed. The nature of emotion is the subject of contentious debate in the field. One area of debate is whether emotions can be organised into discrete categories, such as sadness, anger, and fear, or are more continuous in nature and differ only across broad dimensions, such as arousal and valence. In this chapter, the key theories of emotion and ER will be discussed within the context of this debate, to highlight an area of limitation in the emotion and ER literature – the lack of emotion-specificity in theory and research.

The concept of emotion will be defined, and the key perspectives on emotion will be discussed – discrete emotion theories, dimensional/constructivist theories, and appraisal theories. ER will also be defined, and the main theories of ER will be described – the process model, the extended process model, the dual process model, and Parkinson and Totterdell's taxonomy of affect regulation. This chapter will provide the theoretical framework for the present research.

### **1.2. Emotions**

Emotions fundamentally shape how we experience and interact with the world around us. It is possible for individuals to manage their emotional responses, and to have some level of control over their own emotional experience (McRae & Gross, 2020). The management of emotional responses is known as emotion regulation (ER). The ability to effectively regulate emotions is an essential skill to be able to function adaptively in the world, and the different ways that individuals manage their emotions are related to many important areas of life, including mental health (Cludius et al., 2020).

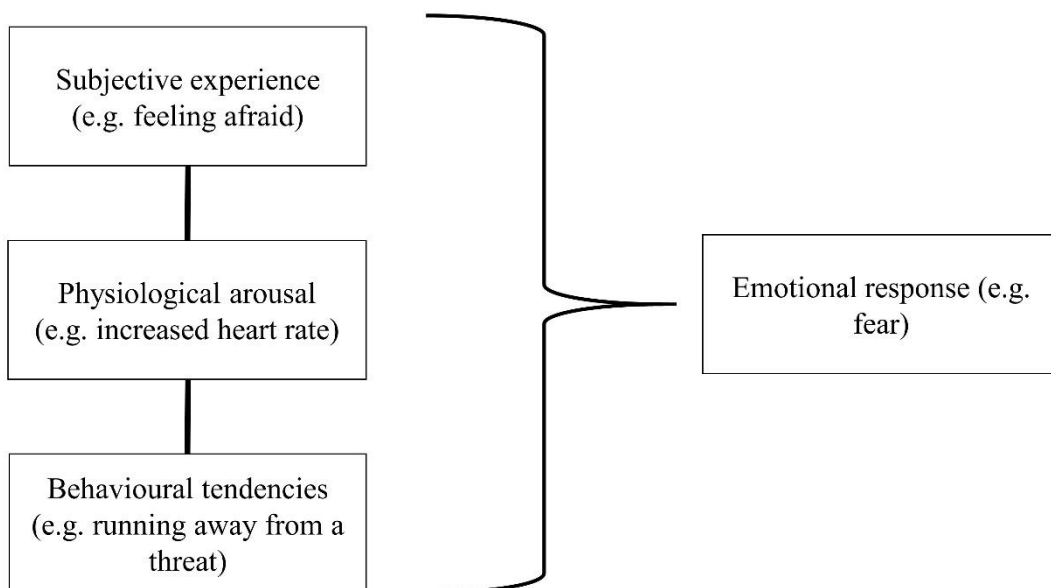
### 1.2.1. The Multi-Component Definition of Emotion

Before discussing how emotions are regulated, it is important to clarify what is meant by an emotion. There is no single definition of emotion which is agreed upon in the literature. However, on a broad level, there is a general consensus that emotions are affective states which are composed of three components that arise in response to personally meaningful stimuli (Gross, 2015a; Mauss & Robinson, 2009; Scherer & Moors, 2019). These components, or emotional response systems, which are depicted in Figure 1.1, are: (1) subjective experience, (2) physiological arousal, and (3) behavioural tendencies.

Different theoretical perspectives diverge on which of these components are the most important and the causal relationships between them (Scherer & Moors, 2019). However, most approaches agree that each of these components are involved in an emotional response, either as a basic building block, or as an external manifestation of the response (Coppin & Sander, 2021; Ekman, 1992; Keltner et al., 2019; Kuppens, 2019; LeDoux & Hofmann, 2018; Mauss & Robinson, 2009; Scherer, 2005).

**Figure 1.1**

*The Multiple Components of an Emotional Response*



Subjective experience refers to the feeling part of emotion, such as having feelings of joy, sadness or fear. This can be distinguished from physical sensations that may arise in the body, such as physical pain. Subjective experience is an important part of an emotional response, and many regard this as the core component which is at the heart of emotion (Kuppens, 2019; LeDoux & Hofmann, 2018; Lieberman, 2019). Subjective experience is central to our understanding of emotion, and it is the internal aspect of an emotional response (LeDoux & Hofmann, 2018).

Physiological arousal refers to changes in the physical state of the body that arise when an emotional response is occurring, due to activation of the autonomic nervous system (ANS; Kreibig, 2010). Physiological changes that occur during an emotional response include increased heart rate, sweating and pupil dilation (Mauss & Robinson, 2009). However, the ANS does not function exclusively for emotional responding, and can become activated for a variety of reasons, including homeostasis and digestion (Robertson, 2019). This means that although physiological arousal is part of an emotional response, it can also be related to other bodily processes.

Action tendencies (or behavioural tendencies) are the behavioural component of an emotional response. These are the behaviours which are associated with a certain emotion and are likely to occur during the emotional response (Ekman & Oster, 1979; Frijda, 1987; Gross, 2015a). Examples of behavioural tendencies are displaying external acts of violence when feeling angry, or rapidly leaving a threatening situation when experiencing fear (Gray, 1971). Emotional behaviour also includes body language, facial expressions, vocalisations, and gestures (Scherer et al., 2019).

The multi-component definition of emotion is the definition used in the present research. This definition was chosen because it is a broad definition of emotion which most emotion theorists agree on (Coppin & Sander, 2021; Ekman, 1992; Keltner et al., 2019;



Kuppens, 2019; LeDoux & Hofmann, 2018; Mauss & Robinson, 2009; Scherer, 2005). It is consistent with the key theories of emotion (discussed in Section 1.2.2), as well as the main emotion regulation theories (discussed in Section 1.3.2). Furthermore, there is strong empirical evidence that these three components (subjective experience, physiological arousal, behavioural tendencies) are involved in an emotional response (Coppin & Sander, 2021; Mauss & Robinson, 2009), and so this definition helps to guide theory and research, as well as the measurement of emotion and ER. The multi-component definition of emotion is consistent with investigating ER in an emotion-specific manner, by providing guidance for how specific emotions can be conceptualised and measured (e.g., by measuring the subjective experience of specific emotions).

### ***1.2.2. Theories of Emotion***

Although it is generally agreed that an emotional response broadly involves the three components discussed in the previous section, there is much debate in the theoretical literature about the nature of emotion. The key theoretical approaches disagree on the extent to which these components are related to one another, and the causal relationships between these components (Adolphs et al., 2019). There is no single, agreed upon definition of emotion in the literature (Gross, 2015a; Kuppens, 2019). In fact, the nature of emotion is the subject of debate in the field of affective sciences as a whole, and emotions remain contested concepts (Adolphs et al., 2019; L. F. Barrett et al., 2018; Cowen & Keltner, 2017, 2018; Ekman, 1992; Gross & L. F. Barrett, 2011).

There are three broad theoretical perspectives in the emotion literature – (1) the discrete emotion perspective (Buck & Powers, 2005; Damasio, 1998; Darwin, 1872; Ekman, 1965, 1992; Ekman & Cordaro, 2011; Izard, 1971; R. Levenson, 1994; Panksepp, 1982; Tomkins, 1962, 1963), (2) dimensional and constructivist approaches (L. F. Barrett, 1998,

2017; James, 1884; Russell, 1980; Russell & L. F. Barrett, 1999; Wundt, 1907; Yik et al., 1999), and (3) appraisal theories (Arnold, 1960a, 1960b; Clore & Ortony, 2008; Frijda, 1986; Lazarus, 1991; Lazarus & Folkman, 1984; Leventhal, 1984; Roseman, 1991; Roseman et al., 1990; Scherer, 1999; Scherer & Moors, 2019; C. A. Smith & Ellsworth, 1985). One of the key areas of debate is whether emotions are organised into distinct categories, or are more continuous in nature and differ only in terms of a small number of dimensions, such as arousal and valence (Adolphs et al., 2019). In the following sections, this concept is referred to as discrete emotions, specific emotions, emotional categories, emotion differentiation and emotion-specificity. Each of the main approaches will be briefly described, including the key tenets of each approach in relation to emotion-specificity.

**1.2.2.1. Discrete Emotion Theories.** The discrete perspective was perhaps the central narrative on emotions throughout the 20<sup>th</sup> century (Keltner et al., 2019). According to the discrete approach, emotions can be organised into distinct categories, such as sadness, anger, and fear (Keltner, 2019). The most comprehensive account of discrete emotion theory is Ekman's (1992) Basic Emotion Theory. Ekman (1992) describes emotions as basic, which means that first of all, emotions evolved to allow individuals to respond adaptively to their environment, in order to reach a goal. For example, the experience of fear might signal that a threat is nearby, which would prompt an individual to respond adaptively by running away and therefore achieving the goal of survival. Secondly, the term basic indicates that there are a number of distinct emotions, which differ from one another in important ways, such as in the appraisals that cause the emotion, and in the circumstances that trigger these appraisals, which are known as the antecedents. Ekman (1992) proposed that there are six emotions which can be defined as basic according to these principles – sadness, anger, fear, disgust, enjoyment, and surprise.

The hallmark of the discrete emotion perspective is that each of the basic emotions differ from one another in the emotional components described in Section 1.2.1. Each emotion (such as sadness or fear) is viewed as a distinct unit with unique biological processes, and therefore has a unique pattern of responses (Mauss & Robinson, 2009). For example, discrete emotion theorists propose that specific emotions arise from dedicated neural pathways, discrete areas in the brain that are exclusive to specific emotions and are active solely when this emotion is being experienced (LeDoux, 2000; Panksepp, 1982), which has been supported with evidence from neuroimaging studies (Phan et al., 2002; Vytal & Hamann, 2010).

Further, many discrete emotion theorists also posit that specific emotions have unique patterns of physiological arousal, subjective experience, and emotional behaviours, and that there is coherence across two or more of these response systems (Buck & Powers, 2005; Darwin, 1872; Ekman, 1992; Izard, 1992; Keltner et al., 2019). Support for the discrete approach comes from testing the extent to which there is coherence in these emotional components in an experimental setting. Evidence for the discrete approach will be discussed in Section 1.2.3.

A sub theory of the discrete approach is the functionalist account of emotions. According to the functionalist approach, emotions evolved to allow us to respond adaptively to our environment, and each emotion has a particular function to help us with goal-related situations (Campos et al., 1994; Lench et al., 2015). In other words, each specific emotion represents a different problem we may face in the world, from a survival perspective (Lench et al., 2015). For example, sadness represents the loss of a goal that cannot be recovered, anger comes from obstacles that are preventing a goal, and fear is related to a threat in the environment (Campos et al., 1994). Therefore, these emotions represent unique problems and

encourage us to respond in different ways. It is logical that these specific emotions would thus be regulated differently.

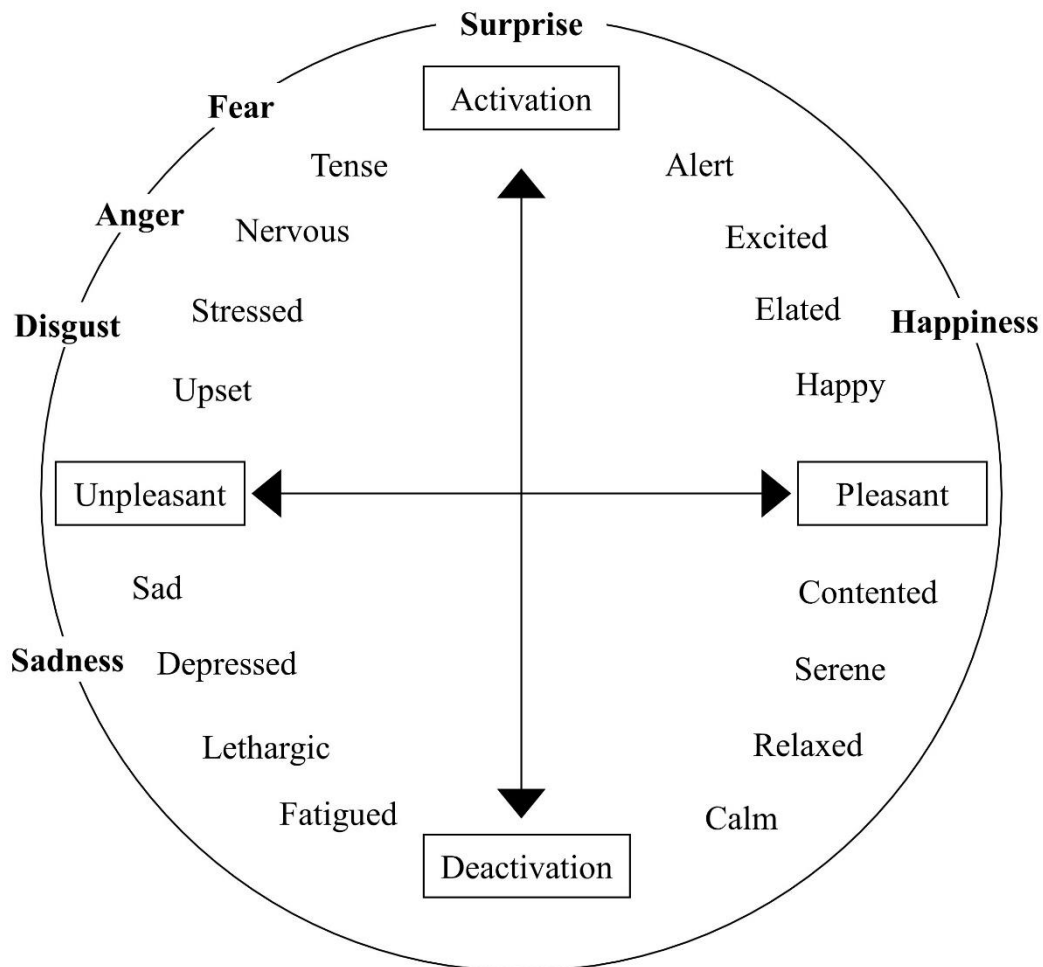
**1.2.2.2. Dimensional/Constructivist Theories.** The dimensional view is in contrast with the discrete approach. According to the dimensional view, emotions can be captured by a small number of fundamental dimensions (Mauss & Robinson, 2009; Russell & L. F. Barrett, 1999). One of the main dimensional perspectives is the core affect theory, which posits that emotion can be described as a psychophysiological state that is categorised in terms of valence and arousal (Russell & L. F. Barrett, 1999). Valence refers to whether the emotion is experienced as pleasant or unpleasant, whereas arousal is the intensity of an emotion.

This approach allows for different emotions to exist, but these emotions appear continuously on dimensional gradients of arousal and valence, rather than being discrete, as depicted in Figure 1.2. Importantly, emotions which have similar valence and arousal are argued to be similar in each of the emotional response systems, including subjective experience. For example, as seen in Figure 1.2, anger and fear are both negative valence and high arousal emotions, and thus should be experienced in a similar manner. According to the dimensional approach, there is nothing inherent in emotions that makes them fundamentally different from one another, but rather they are systematically related (Russell, 1980). The important differences between emotions are considered to be explained by these dimensions (L. F. Barrett, 1998).

Similarly, the constructivist approach also adopts the idea that emotions can be organised along dimensions, rather than being discrete categories. While the discrete perspective proposes that emotions are biological in nature and are a product of evolution (and so are experienced in the same way across cultures; Ekman, 1992), constructivists argue that emotions as we understand them are a product of social learning (L. F. Barrett, 2017).

**Figure 1.2**

*The Dimensional Approach to Emotion (Adapted From Russell & L. F. Barrett, 1999)*



This means that emotion is regarded as being ‘soft-wired’ (learned through social experience) by constructivists, rather than ‘hard-wired’ (innate) which is proposed by many discrete theorists (Panksepp, 1982).

According to the constructivist perspective, individuals receive a mass of sensory data from their internal body (e.g., increased heart rate), which is known as interoception (L. F. Barrett, 2017). The brain does not know the cause of this arousal and so must make sense of it, and to do so it draws on previous experience, and interprets this arousal as emotion (Adolphs et al., 2019). The brain uses these past experiences as a reference point for the current sensations, and so if something similar was experienced in the past, then this is categorised as the same emotion as the previous experience. For example, if an individual

experienced an affective state in the past which was identified as sadness, a comparable set of physiological sensations in the present moment will be similarly labelled as sadness, and thus the emotion of sadness is learned (Adolphs et al., 2019). This approach builds on the early scientific work on the nature of emotions by James (1884), who proposed that the physiological sensations of emotions precede emotional experience, and individuals construct the subjective experience of emotion through this bodily state.

In sum, the discrete perspective views emotions as originating from biological systems, whereas the constructivist approach understands emotions as being mentally constructed from this raw sensory data (Gross & L. F. Barrett, 2011). Constructivists propose that human inference is required to construct emotion (Russell, 2003), while discrete theorists (and many appraisal theorists, as described in the next section) argue that emotions already exist biologically, and human inference identifies these instances of emotion, but has no role in constructing them (Adolphs et al., 2019). Therefore, according to constructivists, discrete emotions do not exist in the traditional sense of biological units which are products of evolution, but rather are socially and culturally learned.

**1.2.2.3. Appraisal Theories.** Appraisal theories focus on the cognitive aspect of emotion. According to this perspective, it is not an event as such that causes an emotion, but rather the evaluation and interpretation of the event (Roseman, 1991). The appraisal of the significance of a situation to our own personal wellbeing leads to the emotional response (Lazarus, 1991). For example, if an individual perceives a threat in the environment, this threat appraisal elicits the emotion of fear, which in turn prompts an adaptive response (e.g., running away from the threat).

In terms of emotion-specificity, appraisal theorists propose that specific emotions are differentiated by appraisals (Roseman, 1991; Roseman et al., 1990; Scherer et al., 2001). That is, different types of appraisals elicit specific emotions, even in the same situation. An

appraisal of threat will lead to a fear response, and an appraisal of loss will lead to a sadness response, regardless of the nature of the emotional stimulus. According to this perspective, each of the basic emotions put forward by Ekman (1992; Ekman & Cordaro, 2011) are associated with a different type of appraisal of an emotionally significant situation, which gives rise to these discrete emotions (Roseman & Evdokas, 2004).

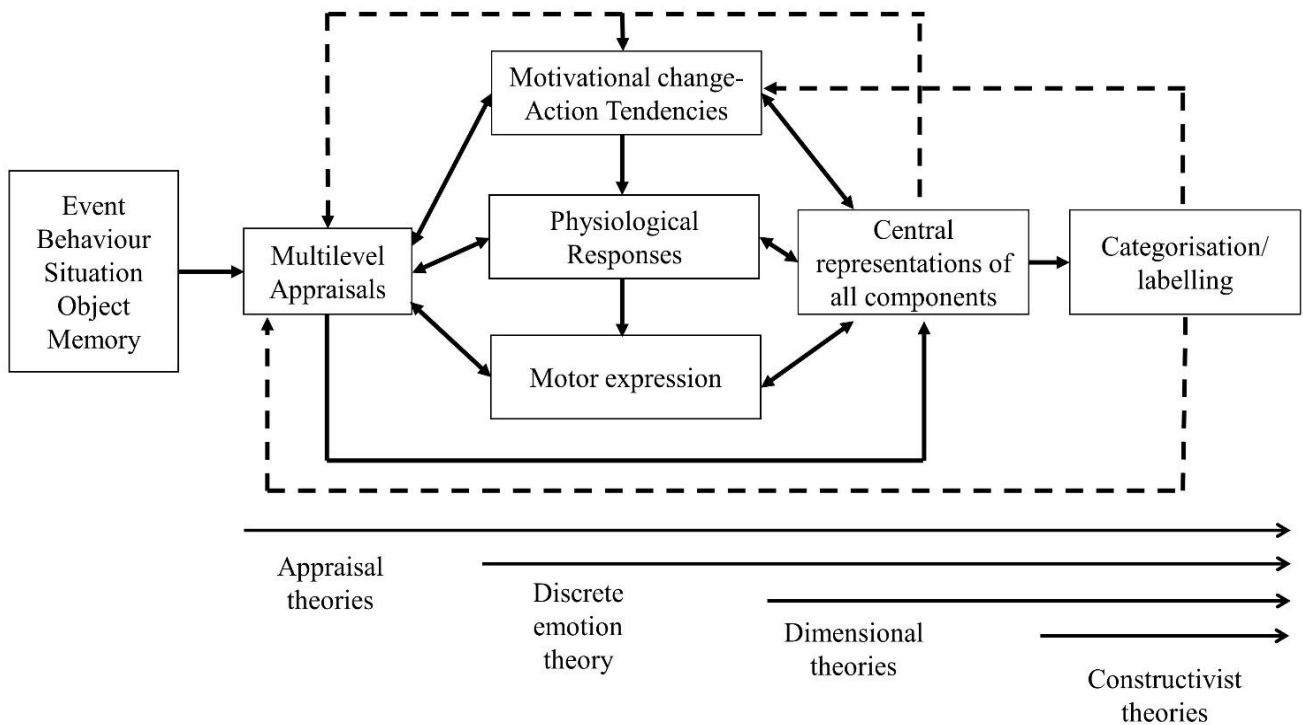
In this sense, appraisal theory is largely compatible with the discrete approach in terms of emotion-specificity. Both theories postulate that emotions are discrete, and according to appraisal theory, different appraisals cause the differentiation in specific emotions (Scherer & Moors, 2019). This explains why in some cases, individuals can have different emotions about the same situation, because they are having different appraisals about the situation (Roseman et al., 1990). For example, one person might feel relief after a relationship ends, while another person may feel intense sadness. The difference in emotional response is due to the varying appraisals of the situation by the two individuals. It also explains why the same person may experience different emotions about the same circumstance at different times (Roseman, 1991).

In summary, it is evident that the emotion literature is complex, and many of the main theoretical approaches diverge on important points. A useful diagram which has been adapted from Scherer (2019), shows how the main theories conceptualise emotion and how they relate to one another in a process model. In Figure 1.3, we can see that emotion begins with an emotional situation (an event, behaviour etc.), and this event leads to an appraisal (according to appraisal theories, and some discrete emotion theorists). This appraisal gives rise to an emotional response, and these changes occur across emotional response systems (e.g., physiological responses). Dimensional theories view these changes as having a central representation which can be defined along a small number of dimensions (Scherer, 2019). Similarly, constructivist theories propose that the sensory data from these dimensions are

categorised by the human brain, and it is the social meaning attributed to physiological responses that create the emotion (Adolphs et al., 2019; Scherer, 2019).

**Figure 1.3**

*Theoretical Approaches to Emotion (Adapted from Scherer, 2019)*



**1.2.3. Evidence for Emotion-Specificity**

In this section, the empirical evidence regarding emotion-specificity will be discussed. As outlined in Section 1.2.2.1, according to the discrete perspective, emotions are organised into discrete categories which differ across emotional response systems (i.e., experience, physiology, and behaviour). Thus, evidence for this approach comes from measuring each of the components of an emotional response in an experimental setting, and testing (1) whether there are differences *between* discrete emotions in each of these components, and (2) whether there is correlation *within* discrete emotions in each of these components during an emotional



response (e.g., there are coordinated responses in each of these systems for sadness, but the responses differ between sadness and anger).

**1.2.3.1. Facial Expression Research.** Facial expression research has provided evidence for the discrete approach. In several landmark studies, when individuals were asked to identify an emotion from a facial expression, they were able to do so accurately, with most participants correctly identifying the expressions, and this was consistent across cultures (Ekman & Friesen, 1971; Ekman et al., 1987; Ekman et al., 1969; Izard, 1971). Furthermore, individuals were able to distinguish most of the basic emotions (sadness, anger, fear, disgust, surprise, enjoyment) from one another, although the rate of accuracy in differentiating between surprise and fear was lower (Ekman & Friesen, 1971). These findings support the view that distinct emotions give rise to differential facial expressions, which is a type of emotional behaviour, and that these responses can be meaningfully distinguished from one another.

**1.2.3.2. Human Vocalisation Research.** Similarly, specific emotions can be identified from human vocalisations. Vocalisations refer to any of the social sounds that humans make, including words, laughter, playful intonation, sarcastic tones, sighs, and singing (Cowen et al., 2018). In a study by Cowen et al. (2018), individuals were asked to identify the emotion represented by brief vocalisations. Participants were able to accurately identify the emotion represented by these vocalisations, both in a laboratory session and in real life, and at least 24 distinct emotions were identified. This finding indicates that specific emotions are represented by these brief vocalisations, which are thought to predate human language (Cowen et al., 2018), thus suggesting that emotions can be organised into discrete categories. Although the number of discrete emotions identified by Cowen et al. (2018) is significantly larger than that proposed by Ekman (1992), this research nonetheless supports the discrete approach.

### **1.2.3.3. Meta-Analysis of Studies Examining Emotional Components.**

Furthermore, hundreds of studies have found differences across each of the emotional response systems for specific emotions (Lench et al., 2011). In a large meta-analysis of 687 studies (Lench et al., 2011), the extent to which specific emotions elicited changes in the three components of emotion – experience, behaviour, and physiology – as well as in cognition and judgment, was investigated. Discrete emotions, on average, differed in the effect they had on these variables, with a medium effect size. Importantly, each of the negative emotions (sadness, anger, and anxiety) were different across emotional response systems, with a small to medium effect size (Lench et al., 2011). This finding indicates that there are unique responses in each of the emotional response systems for discrete emotions, including specific negative emotions.

An important finding to highlight from Lench et al. (2011) was that self-reported subjective experience was different for each specific emotion, and this had a large effect size. This demonstrates that discrete emotions have unique subjective experiences, and this is a robust effect in the literature (Baumgartner et al., 2006a; Baumgartner et al., 2006b; Cowen et al., 2020; Cowen & Keltner, 2017; Dimberg, 1988; Harmon-Jones & Sigelman, 2001; Joseph et al., 2020). Similarly, individuals spontaneously talk about discrete emotions such as excitement, worry, and sadness in focus group settings (Stupnisky et al., 2016). The difference in reported subjective experience lends support to the discrete perspective and highlights the importance of using self-reporting as a method for measuring specific emotions, as this is the key method for measuring subjective experience. This will be detailed further in the discussion of methodological approaches in Chapter 3.

### **1.2.3.4. Bridging the Gap Between Discrete and Dimensional Perspectives.**

Traditionally, the discrete perspective has posited that emotions are organised into mutually exclusive categories. However, recent evidence has provided a more nuanced view on this

debate, and has helped to bridge the gap between discrete and dimensional perspectives. It is notable that in the study by Lench et al. (2011) described above, there was not a perfect correlation between the emotional components, which indicates that there was some variability between the components. Evidence has indicated that although emotions are more accurately described by categorical labels, the boundaries between these categories may not be clearly defined, and can be described as ‘fuzzy’ rather than hard (Cowen & Keltner, 2017).

In Cowen and Keltner (2017), participants were asked to rate emotional film clips in terms of their subjective experience. Discrete category labels more accurately described emotional states than dimensional labels. However, a greater number of emotions were identified than originally proposed by Ekman (1992), with 27 distinct categories being identified in the study. Further, it was found that the boundaries were not completely distinct between emotions, and in fact there was a gradient between emotions (e.g., the continuous gradient from anxiety to fear to horror), which varied along dimensional lines (such as intensity).

This line of research has been critiqued by constructivist theorists. For example, L. F. Barrett et al. (2018) proposed that the findings of Cowen and Keltner (2017) are inconsistent with other studies which demonstrate that instances of an emotion belonging to the same category (e.g., instances of fear) vary considerably in their features (e.g., feelings, expressions, etc.), and instances of different emotion categories have considerable similarities in their features. That is to say, that there is significant within-category variability, and between-category similarity between different emotions. However, this variability is accommodated by the framework proposed by Cowen and Keltner (2017), which demonstrates that discrete categories can be organised along a gradient, but still remain as categories. They argue that measuring emotion solely along the dimensions of valence and arousal is insufficient to explain the variety of reported categories of emotional experience in

their data (Cowen & Keltner, 2018). There is variability in emotional categories, but nonetheless, categories are the best way to semantically capture the emotional experience reported by participants. This variability represents the gradient between different emotional states that belong to the same category, such as anxiety, fear, and horror.

In sum, there is strong evidence that emotional categories exist, but that the boundaries between them are fuzzy rather than hard. This evidence bridges some of the gaps between discrete and dimensional approaches, and indicates that dimensional aspects (such as valence and arousal) are important, but nevertheless emotions can be more accurately distinguished in terms of emotion categories, especially in terms of subjective experience between these categories.

**1.2.3.5. Appraisal Research.** Evidence from empirical research on appraisal theory indicates that distinct emotions are elicited by different appraisals of an emotional situation. In Roseman (1991), when participants were asked to read stories in which the appraisals were experimentally manipulated and to report on their perception of the emotion experienced by the person in the story, different appraisals corresponded with specific emotions. For example, when a situation was appraised as being a negative outcome that was caused by another person when a positive outcome had been deserved, this resulted in high levels of anger, indicating that this type of appraisal leads to anger (Roseman, 1991). Specific types of appraisals have also been found to differentiate between boredom and other negative emotions (Van Tilburg & Igou, 2017).

Moreover, in Herrald and Tomaka (2002), 109 adult participants were asked to complete a neutral computer task, while a study confederate attempted to induce anger, shame, or pride within the participants using verbal and non-verbal behaviours. For example, to provoke anger, the confederate made hostile, demeaning remarks and showed little respect to the participant. Subjective experience, appraisals, and physiological responses (cardiac

activity) were some of the outcomes measured at baseline, and after the emotional manipulation. Participants in each of the three emotion conditions (anger, shame, pride) were found to differ in the subjective experience compared to baseline (i.e., when the emotion of anger was elicited, participants reported experiencing more anger than other emotions), and they also varied in the specific appraisals they reported. Some emotions also differed in their physiological responding. For example, anger had higher cardiac reactivity than pride, as measured by pre-ejection period, PEP. These findings support a discrete approach.

These findings are further reinforced by research from Roseman and Evdokas (2004) who found that manipulating appraisals in an experimental setting gave rise to the specific positive emotions of joy, relief, and hope. This lends support to the hypothesis that discrete emotions differ in each of the emotional response systems, particularly subjective experience, and that specific appraisals give rise to these discrete emotions, as postulated by appraisal theory.

**1.2.3.6. Summary of Evidence for Emotion-Specificity.** In summary, based on the evidence that has emerged in the empirical literature, the following conclusions can be drawn about emotion-specificity. Firstly, there is strong evidence that emotions can be organised into discrete categories, albeit with fuzzy boundaries (Cowen & Keltner, 2017). These specific emotions are differentiated in terms of their subjective experience, physiological arousal and emotional behaviours such as facial expression. Although dimensions of emotion (such as arousal and valence) are important factors of an emotional response, these are not sufficient for distinguishing between different emotions, based on the available evidence (Cowen & Keltner, 2017).

Secondly, the emotional component with the most convincing evidence for emotion-specificity is subjective experience, with hundreds of studies finding that emotions are distinct in subjective experience, and this is a robust finding with a large effect size (Cowen

et al., 2020; Cowen & Keltner, 2017; Joseph et al., 2020; Lench et al., 2011). This highlights the importance of including subjective experience in the study of specific emotions. Further, it is likely that unique appraisals of an emotional situation lead to different emotions, and give rise to these differences in subjective experience, as proposed by appraisal theorists (Roseman, 1991; Roseman et al., 1990).

### **1.3. Emotion Regulation**

#### ***1.3.1. Definition of Emotion Regulation***

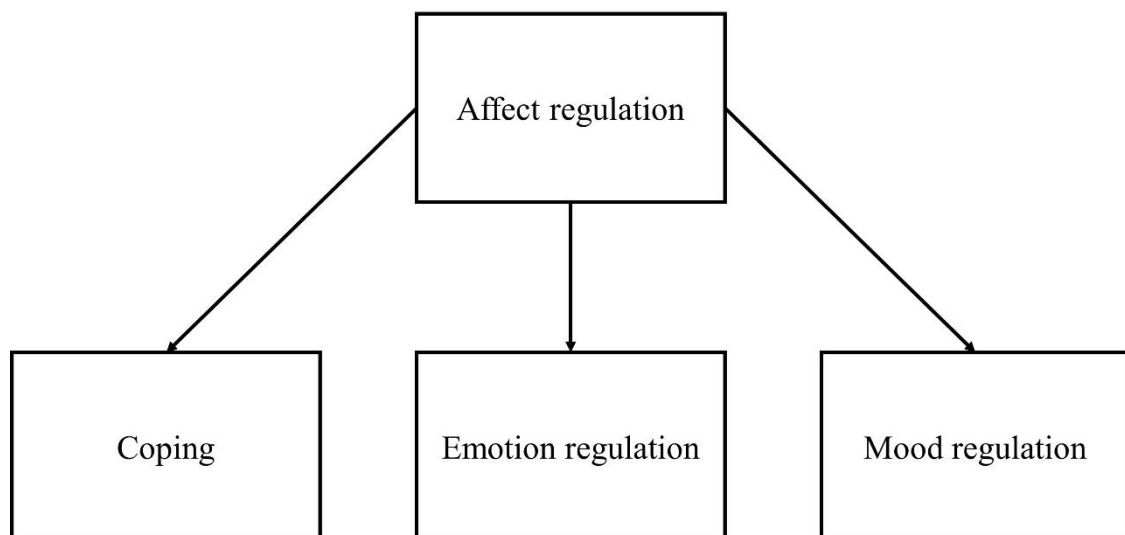
In the previous section, it was established that emotions can be organised into discrete categories, such as sadness, anger, and fear. It is possible for individuals to change these specific emotional responses, which is known as emotion regulation, ER (McRae & Gross, 2020). ER can be defined as the “processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions” (Gross, 1998b), which is referred to as the process definition of emotion. The process definition of ER will be used in the present research. This definition of ER was chosen because it derives from one of the key theories of ER, the process model, and this theory is supported with empirical evidence (Gross, 1998a; Hermann et al., 2017; Quinn & Joormann, 2020; Sheppes & Meiran, 2007, 2008; Smoski et al., 2014; Thiruchselvam et al., 2011). This definition conceptualises ER on a temporal basis and so provides a way of understanding how different ER strategies can influence the emotion process. It is consistent with conducting research into ER in an emotion-specific manner, as specific emotions can be conceptualised as different process models. The process definition of ER is also consistent with the multi-component definition of emotion described in Section 1.2.1, as the different components of an emotional response represent the final stage of the unfolding of an emotional response which is described by the process definition of ER. The process definition of ER is helpful as

it also indicates that individuals can influence which emotions they have but do not always have complete control over their emotional response.

ER may be cognitive in nature, such as changing thought patterns in order to feel better, or behavioural, such as taking part in a fun activity to reduce negative emotions (Parkinson & Totterdell, 1999). ER can also be a deliberate process which involves an intention to feel better, or it can occur subconsciously (Gross, 1998b; Gyurak et al., 2011). ER can be distinguished from the regulation of other affective states, such as affect regulation, coping, and mood regulation. Affect can be regarded as the general umbrella term for all affective states that involve a valuation process (Gross, 2015a), such as mood, emotion, and stress, and thus ER is a subcategory of affect regulation, as depicted in Figure 1.4.

**Figure 1.4**

*The Relationship Between Different Types of Regulation (Adapted From Gross, 2015)*



Coping refers to the process of managing stress, which is a physiological response arising from appraisals of challenging environmental demands (Carver et al., 1989). Some distinctions between ER and coping include: (1) ER can be implicit (subconscious) or explicit

(deliberate) in nature, whereas coping only involves explicit processes, (2) coping involves the regulation of stress specifically, whereas ER involves regulating emotions in response to a much wider range of circumstances, and (3) ER can involve both intrinsic and extrinsic processes, which means that emotions can be regulated by external factors (e.g., other people), whereas coping involves only intrinsic processes (Compas et al., 2014). ER and coping are independent constructs, although the two can occur simultaneously, for example during a stressful life event (Garnefski et al., 2001).

In terms of the difference between ER and mood regulation, mood and emotion differ in the length of time they tend to be experienced (Gross, 2015a). Emotions occur over a relatively short period of time such as a few seconds, minutes, or hours (Lench et al., 2011; Verduyn & Lavrijsen, 2015), whereas mood can span across longer periods such as days or weeks (Nolen-Hoeksema et al., 1993). They also differ in terms of antecedents, with emotions tending to have a specific trigger event, and mood being more diffuse in nature (Gross, 2015a). This means that ER tends to occur in the moment of encountering the emotion-eliciting stimulus, and is more short-term in nature, whereas mood regulation involves attempting to influence the affective state on a more long-term basis, and is not necessarily in response to a specific stimulus.

Individuals have a repertoire of ER strategies that can be drawn upon during an emotional episode (Dixon-Gordon et al., 2014), and a large number of ER strategies exist. Almost any activity (including cognitive activity) which is undertaken with the intention of influencing emotion can be regarded as a type of ER. Some of the most common ER strategies that are researched in the empirical literature are summarised in Table 1.1. Some attempts have been made to create a taxonomy of ER strategies, such as by Parkinson and Totterdell (1999), and this framework will be discussed in Section 1.3.2.4. We can see from



Parkinson and Totterdell's (1999) taxonomy that there are a large number of strategies available to regulate emotions.

**Table 1.1**

*Common ER Strategies in the Literature*

<b>ER Strategy</b>	<b>Definition</b>
Acceptance	Acknowledging emotions without judgement
Avoidance	An attempt to avoid the emotion or leave the emotional situation
Brooding	A type of rumination that is characterised by passively focusing on the reasons for the emotion or emotional situation
Catastrophising	Focusing on thoughts which emphasise the terror of the situation
Cognitive Reappraisal	Changing thoughts about a situation to reduce its emotional impact
Distraction	Diverting attention from the situation and doing or thinking something that is unrelated
Experiential Suppression	Pushing negative thoughts or feelings out of conscious awareness
Expressive Suppression	Not externally expressing an emotion
Passivity	Waiting to see what comes of the situation and not taking any action
Positive refocusing	Focusing attention on to pleasant events
Problem Solving	Actively attempting to overcome or solve a problem
Putting into perspective	Thoughts of brushing aside the seriousness of the event
Reflection	A type of rumination characterised by paying attention to an emotional situation with curiosity
Rumination	Persistently focusing on the causes and consequences of the situation without engaging in problem solving
Social support seeking	Looking to others for comfort
Substitution	Thinking of a happy memory when experiencing a negative emotion

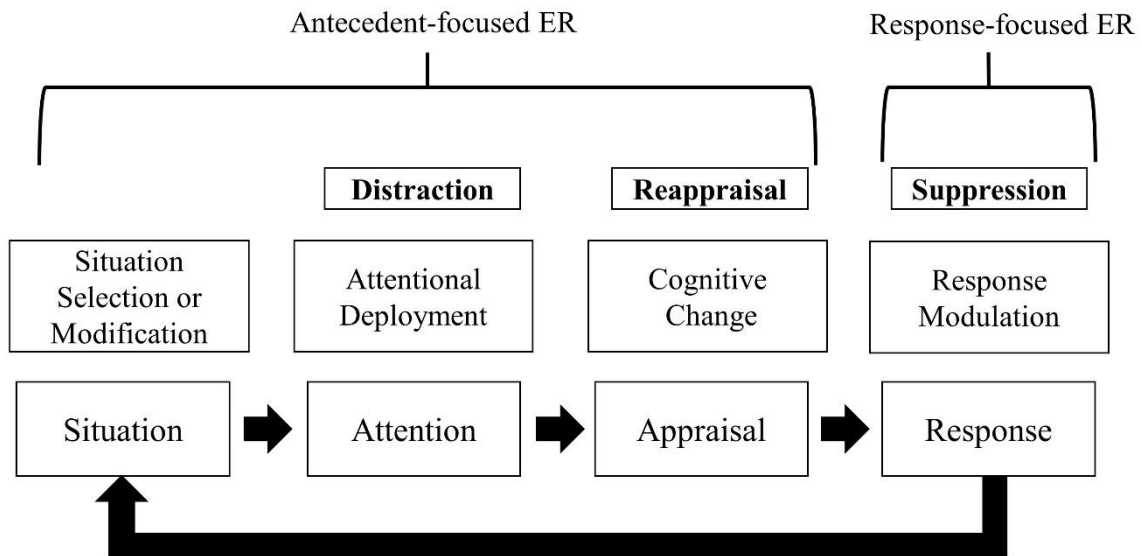
### ***1.3.2. Theories of Emotion Regulation***

There are several theoretical approaches to ER, and the key theories in the ER literature are essentially models of how ER strategies can be categorised. The main approaches to ER tend to complement, rather than contradict, one another. They are not mutually exclusive, but rather they focus on different aspects of the regulation process. Emotions are thought to (1) unfold over time, as outlined by the process model of ER (Gross, 1998b), (2) involve reaching a personally significant goal, as outlined by the extended process model (Gross, 2015b), (3) be regulated by processes that are either implicit or explicit in nature, as posited by the dual process model (Gyurak et al., 2011), and (4) be regulated by both cognitive and behavioural strategies, and strategies that involve engaging or disengaging with a stimulus, as suggested by Parkinson and Totterdell (1999). Each of these perspectives will be discussed in turn.

**1.3.2.1. Gross's (1998b) Process Model of ER.** Arguably the most influential model of ER is Gross's (1998b) process model. Gross (1998b) developed the process model of ER based on Lazarus's earlier work on threat appraisal and coping, which postulated that the appraisal of a threatening situation triggers the stress response (Lazarus & Alfert, 1964). According to the process model, an emotion unfolds over time, and ER strategies are categorised according to the point at which they intervene in this process. As shown in Figure 1.5, there are four stages of an emotional response. Firstly, there is a situation which triggers the process (1), and the individual must focus attention on to this situation (2). Next, the individual has an appraisal of the situation (e.g., that there is a threat) (3), and this gives rise to activation in each of the emotional response systems described in Section 1.2.1 (4) (McRae & Gross, 2020). The process model is an appraisal model of emotion and is consistent with the broader appraisal approach described in Section 1.2.2.3.

**Figure 1.5**

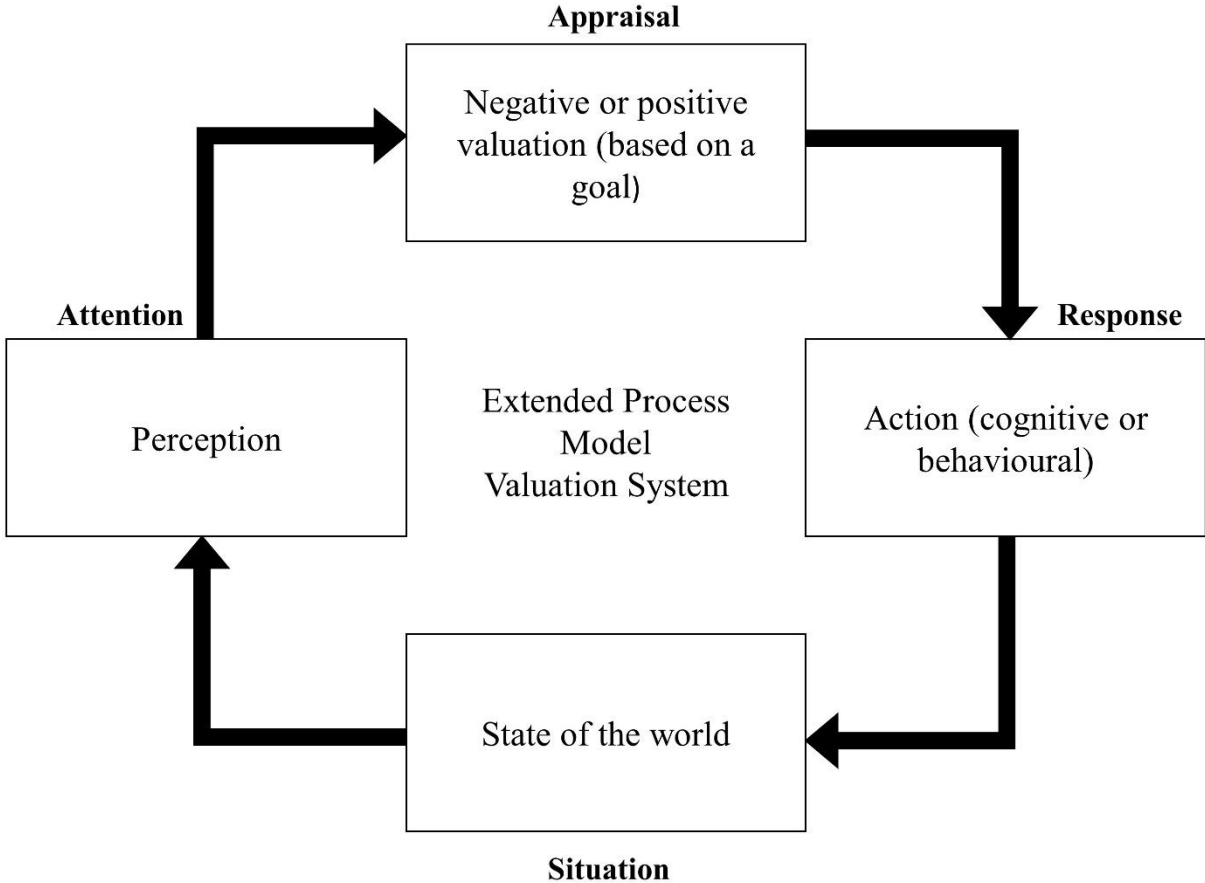
*The Process Model of ER (Adapted From McRae & Gross, 2020)*



**1.3.2.2. The Extended Process Model of ER (Gross, 2015b).** The process model has evolved in recent years, and the extended process model (EPM) was developed to further thinking around ER (Gross, 2015b). The process model is important to understand because it explains clearly how different ER strategies can intervene in an emotional response, and the effect that this has on the resulting emotion. However, it is also important to discuss the EPM because it relates ER to goal achievement, which was not included in the original process model. The EPM integrates the control theory approach to behaviour into the process model (Carver & Scheier, 1982). It builds on the original process model by conceptualising the emotion generative process as a cycle, rather than on a linear timeline. According to the EPM, emotions arise through a process of valuation, which is deciding that something is ‘good for me’ or ‘bad for me’ (Gross, 2015a). The EPM highlights that emotions are regulated in pursuit of achieving goals, e.g., to feel better, and the regulatory process begins when there is a sensed discrepancy between reality and this goal (McRae & Gross, 2020).

**Figure 1.6**

*The Extended Process Model of ER (Adapted From Gross, 2015)*



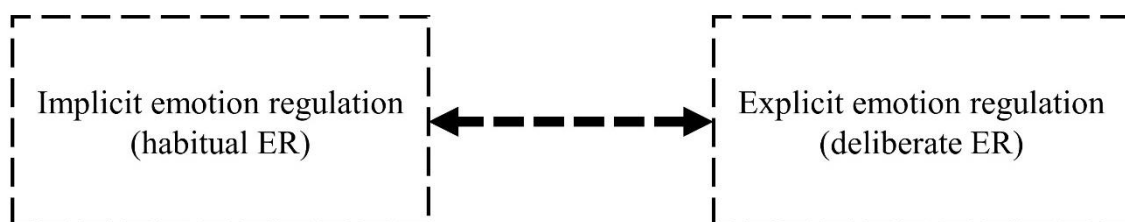
The valuation process involves four steps, as shown in Figure 1.6. Firstly, the input to the model is the (1) state of the world as it currently exists, which an individual will (2) perceive (or pay attention to). This perception leads to (3) a negative or positive valuation based on how close an individual is to reaching a particular goal. This valuation gives rise to (4) an action which can alter the individual’s environment (i.e., the state of the world) which forms the input to a new loop. Thus, emotions arise in a cyclical process, with the output of the first process model (the emotional response) forming the input of the next model (the situation that is being perceived and appraised). The original linear process model maps on to the cyclical depiction of the extended process model, which is shown in Figure 1.6 in bold text (Gross, 2015a).

**1.3.2.3. Dual Process Model of ER (Gyurak et al., 2011).** As discussed in the previous section, the process model distinguishes ER strategies on the basis of the point at which the strategy intervenes in an emotional response (Gross, 1998b). Alternatively, ER strategies can be differentiated based on whether they are executed deliberately with conscious awareness (explicit strategies) or occur automatically, outside of conscious awareness (implicit strategies), which is proposed by the dual process model (Gyurak et al., 2011). This does not contradict the process model, but rather it focuses on categorising ER on a different level. All of the strategies outlined in the process model can occur either implicitly or explicitly, e.g., cognitive reappraisal may be an automatic strategy that an individual uses naturally without much awareness (Timmer-Murillo et al., 2020), or it can be deliberately used, such as when instructed to during an ER task (Gross, 1998a).

According to the dual process framework, explicit and implicit ER are distinct, yet interrelated processes (Gyurak et al., 2011). As shown in Figure 1.7, explicit and implicit ER are not mutually exclusive categories (as depicted by the dotted outlines), and different ER strategies vary in how implicit or explicit they are over time (Gyurak et al., 2011).

**Figure 1.7**

Dual Process Framework of ER (Adapted From Gyurak et al. 2011)

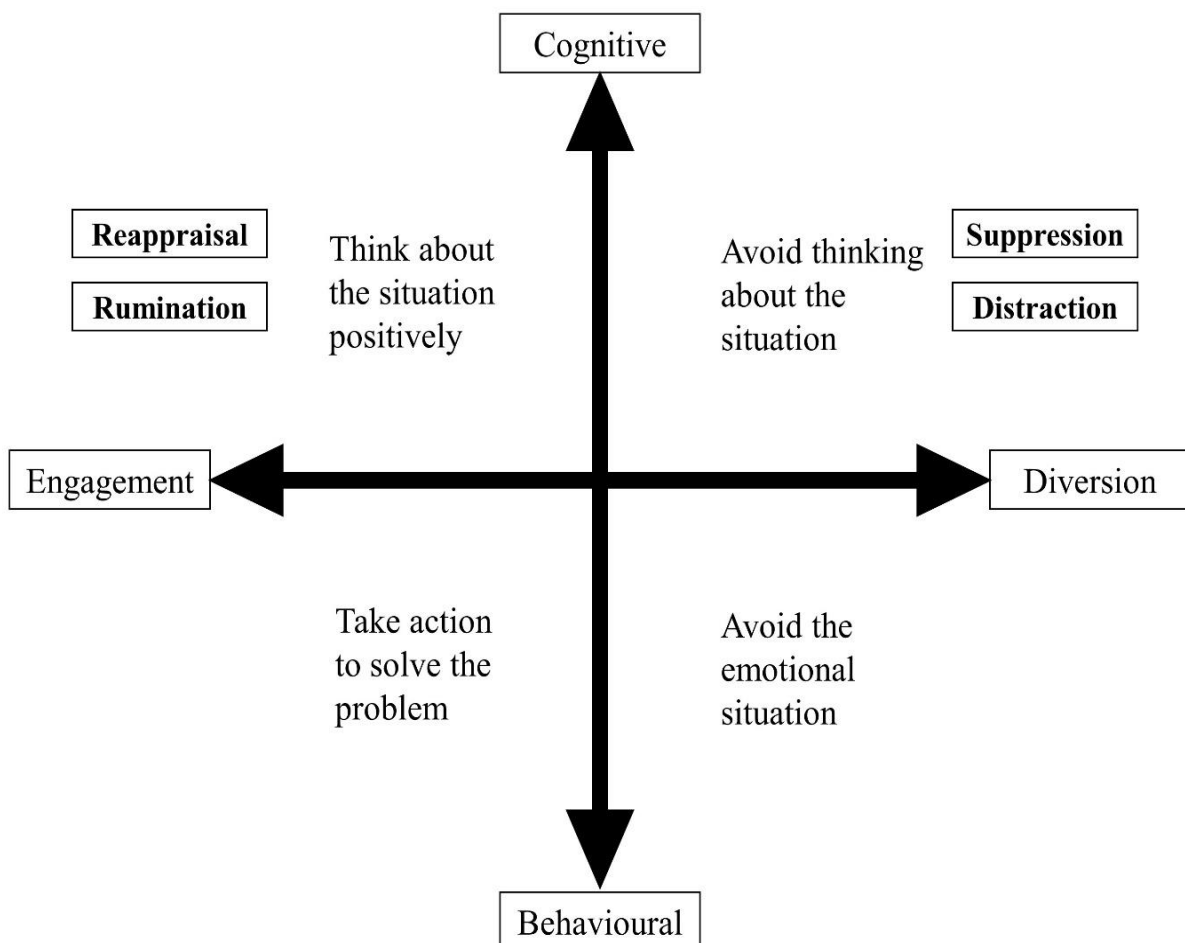


#### 1.3.2.4. Parkinson and Totterdell's (1999) Taxonomy of Affect Regulation.

Parkinson and Totterdell's (1999) framework is not a theory of ER per se, but rather is a taxonomy of ER strategies which categorises strategies in a useful way, based on empirical evidence. According to the framework, ER strategies can be distinguished along two high-level dimensions, as shown in Figure 1.8. Firstly, ER strategies can be categorised according to whether they are cognitive or behavioural in nature. A behavioural strategy involves 'doing' something, such as chatting with friends or listening to music. Alternatively, a cognitive strategy involves 'thinking' something, such as changing the meaning of an emotional situation. Some examples have been provided in Figure 1.8, but there are many more instances of cognitive and behavioural ER.

**Figure 1.8**

*Taxonomy of ER Strategies (Parkinson & Totterdell, 1999)*



Secondly, ER strategies can be categorised according to whether they involve engaging with the emotion or emotional situation or diverting attention away from the emotion or emotional situation. Engagement ER involves paying attention to the emotion, and this includes cognitive strategies such as changing the way a situation is thought about, or behavioural strategies, such as taking action to solve the problem. Alternatively, individuals may divert attention away from the emotion or the situation that caused the emotion, which is known as diversion ER. This can also be cognitive or behavioural in nature. Diversion is disaggregated further in the framework by making a distinction between disengagement and distraction ER (which are both part of diversion ER). While disengaging involves removing attention from the emotion, distraction involves removing attention from the emotion and replacing this with something unrelated to the emotional situation.

This framework is consistent with the process model of ER (Gross, 1998b). The different strategies that arise from the Parkinson and Totterdell (1999) framework fit into the process model at different stages. For example, reappraisal is a cognitive strategy and expressive suppression is a behavioural strategy according to both theories. In terms of the engagement-diversion distinction, any strategies such as rumination or reappraisal that involve paying attention to the emotional situation would be regarded as engagement strategies, whereas strategies that involve diverting attention away from the stimulus such as suppression or distraction would be categorised as diversion strategies. Therefore, they are slightly different categorisation systems but are broadly consistent and refer to many of the same ER strategies.

The value of the Parkinson and Totterdell model is that it provides guidelines for how ER strategies can be categorised, which is supported with empirical evidence (Aldao et al., 2010; Gross & John, 2003; Parkinson & Totterdell, 1999). This means that when conducting ER research, measures which encourage free responses in order to capture a wide range of

strategies can be used, rather than relying on standardised questionnaires which predetermine strategies. These responses can subsequently be categorised using the taxonomy and guidelines provided by this framework, which ensures that the ER strategies recorded are a true reflection of the strategies participants actually use. This method was used in the present research, which is discussed in Section 3.5.2.1. Therefore, the Parkinson and Totterdell framework provides a valuable tool for ensuring accuracy in measuring ER using this novel approach.

Furthermore, one area for which the Parkinson and Totterdell model is particularly useful is that of gender differences. As will be discussed in Chapter 2, there are gender differences in ER. Two patterns that have emerged in the empirical literature are that (1) females tend to use cognitive ER more than males (Garnefski et al., 2004), and (2) females tend to use strategies that involve engaging with their emotions, such as rumination (D. P. Johnson & Whisman, 2013; Nolen-Hoeksema & Aldao, 2011; Zlomke & Hahn, 2010), whereas males are more likely to use strategies that involve diverting attention from emotions, such as avoidance or distraction (Trives et al., 2016; Zimmermann & Iwanski, 2014). Thus, the gendered patterns emerging in the literature mirror the distinctions made by Parkinson and Totterdell (1999) in their framework, and so it may be a useful taxonomy for defining ER strategies using the free response method described, particularly in work investigating gender differences in ER.

### ***1.3.3. Emotion-Specific Emotion Regulation***

**1.3.3.1. Research Findings of Emotion-Specific Emotion Regulation.** Emotions can be organised in terms of discrete categories, such as sadness, anger, and fear (Cowen et al., 2018; Cowen et al., 2020; Cowen & Keltner, 2017; Ekman, 1992; Keltner et al., 2019; Lench et al., 2011). The regulation of these specific emotions is known as emotion-specific



ER (Zimmermann & Iwanski, 2014). Relatively few studies in the literature have focused on the regulation of multiple specific emotions, but rather have focused on the regulation of negative and positive emotion in general (Bomyea et al., 2020; Goldin et al., 2008; Gratz & Roemer, 2004; Gross & John, 2003; Jackson et al., 2000; Ochsner et al., 2002; Richards & Gross, 2000; Sheppes et al., 2014), the stress response (Lazarus & Alfert, 1964; Notarius & Levenson, 1979), or have focused on inducing one emotion in a single study, rather than several emotions (Gross, 1998a; Gross & Levenson, 1993; Hartley & Phelps, 2010; Mauss et al., 2007a; Mauss et al., 2007b; Sheppes & Meiran, 2007; Szasz et al., 2011). This lack of emotion-specific research is possibly due to an underlying assumption that the way that one emotion, or negative emotion in general, is regulated can be extrapolated to other specific emotions.

However, there is empirical evidence that this is not the case. In Zimmermann and Iwanski (2014), the use of several ER strategies to regulate the specific emotions of sadness, anger and fear was measured in a range of age groups (individuals aged 11, 13, 15, 17, 19, 22, 25, 29 and 50 years old) to assess the development of emotion-specific ER from adolescence into adulthood. Two important findings emerged from this study.

Firstly, specific emotions tend to be regulated using different strategies. Specifically, when individuals feel sad, they are more likely to use social support seeking, passivity, and avoidance than when they feel scared or angry. To regulate anger, people are more likely to use dysregulation or dysfunctional rumination. When individuals feel scared, they tend to use suppression and rumination. This is supported with evidence that individuals are likely to regulate specific emotions using different reappraisal tactics, with participants being more likely to use acceptance reappraisals (i.e., ‘that’s the way life goes’) to regulate sadness and changing future consequences through reappraisal (i.e., ‘things will turn out better than expected’) to regulate fear (Vishkin et al., 2020). These findings indicate that the ER

strategies individuals use may depend on the emotional context, and specific emotions are regulated in different ways.

The second important finding from Zimmermann and Iwanski (2014) is that the development of ER has a different trajectory for specific emotions. For example, the use of expressive suppression to regulate fear increases from adolescence into adulthood, however this is not the case for using expressive suppression to regulate sadness or anger. That is, the use of suppression to regulate sadness or anger does not increase with development. These findings indicate that ER differs between specific emotions, and the development of ER is emotion specific. Therefore, it is incorrect to assume that what is known about the regulation of general negative emotion, or one individual emotion, can be applied to all specific emotions. If general negative emotion had been measured in Zimmermann and Iwanski (2014), these emotion-specific caveats in ER would have been masked.

Although research in this area is limited, some studies have investigated the regulation of multiple specific emotions. The available evidence indicates that the regulation of specific emotions does have a differential impact both on the effectiveness of ER and on other life areas. For example, in a sample of depressed and non-depressed participants, the use of suppression was not effective at reducing sadness levels, but was effective at reducing anxiety for the non-depressed participants (Boland et al., 2019), which shows that the effectiveness of suppression depends on the emotion being regulated. Similarly, when individuals are shown fear-inducing stimuli, there is little difference in the effectiveness of reappraisal and suppression in reducing negative emotion (Olatunji et al., 2017). However, when participants are shown disgust-inducing stimuli, reappraisal is more effective than suppression at reducing negative emotion (Olatunji et al., 2017), which supports the postulation that ER may differ between fear and disgust. In adolescence, reappraisal is more effective than distraction at reducing fear and anxiety, but there was no difference when

regulating other emotions (Theurel & Gentaz, 2018). Therefore, the effectiveness of ER strategies can depend on the emotion being regulated.

The ability to effectively regulate specific emotions is also differentially related to correlates of ER. Amongst adults with post-traumatic stress disorder (PTSD), difficulties in regulating sadness and fear contributed to using self-harm as an ER strategy, but this was not the case for anger (A. Bradley et al., 2019). In children with ADHD, anger dysregulation explained the relationship between negative affect and externalising symptoms (such as aggressive behaviour), but sadness regulation did not account for this relationship (Leaberry et al., 2019). Similarly, in a sample of adults, sadness dysregulation predicted depression and social anxiety but not aggression, whereas anger dysregulation predicted aggressive behaviour, but not depression or social anxiety (Clear et al., 2019). Furthermore, suppression of anxiety has a different effect in depressed people compared to people who are not depressed, but there is no difference between these groups when suppressing sadness (Boland et al., 2019).

These findings demonstrate that what is known about the regulation of one emotion cannot necessarily be applied to all emotions (Vishkin et al., 2020), and regulating specific emotions can have a unique relationship with correlates of ER. Therefore, it is imperative that the ER literature investigates the regulation of emotions in an emotion-specific manner moving forward.

**1.3.3.2. Why Sadness, Anger and Fear?** In the present research, three specific emotions are focused upon – sadness, anger, and fear. These emotions were chosen for three key reasons. Firstly, they are part of Ekman's (1992) six basic emotions, as described in Section 1.2.2.1, which means that these are key emotional states which can be distinguished from one another (Ekman, 1992; Ekman & Cordaro, 2011). The term basic also denotes that each

emotion has evolved to enable individuals to deal with different circumstances that arise in life, such as loss (sadness), interference with an important goal (anger), or a threat (fear) (Ekman & Cordaro, 2011). In studies which aim to discover how many discrete emotions exist, sadness, anger, and fear consistently emerge as key emotional states (Cowen et al., 2018; Cowen et al., 2020; Cowen & Keltner, 2017). Furthermore, sadness, anger, and fear are amongst the top five most regulated emotions (Gross et al., 2006).

Secondly, in previous research which has examined ER in an emotion-specific manner, sadness, anger, and fear are three of the most commonly-researched emotions (Boland et al., 2019; Bujor & Turliuc, 2020; Endrerud & Vikan, 2007; Perchtold et al., 2019; Vishkin et al., 2020; Wong et al., 2018), although few researchers have examined all three emotions in a single study. Additionally, sadness, anger and fear were examined in Zimmermann and Iwanski (2014), and it was found that the regulation of these emotions may develop independently across adolescence and into adulthood. Therefore, by selecting these emotions for examination in the present research, this provides an opportunity to build on existing knowledge.

Lastly, sadness, anger, and fear are three specific emotions which are strongly associated with clinical disorders, and behaviours associated with these disorders. For example, according to the DSM-V (American Psychiatric Association, 2013), one of the criteria for a diagnosis of clinical depression is prolonged experience of depressed mood, which is comparable to an intense experience of sadness. Dysregulation of sadness and anger have been implicated in depression and social anxiety, and the dysregulation of anger is associated with aggressive behaviour (Clear et al., 2019; Harmon et al., 2019). Similarly, experiencing symptoms of anger is associated with a range of different clinical disorders and behaviours, including major depressive disorder, bipolar disorder, social phobia, generalised anxiety disorder, obsessive compulsive disorder, post-traumatic stress disorder, and alcohol and drug

use disorders (E. L. Barrett et al., 2013). Furthermore, many anxiety disorders are characterised by excessive fear (Craske, 1997), and traditionally anxiety disorders have been examined through models of fear (Shin & Liberzon, 2010). Therefore, by investigating sadness, anger, and fear in the present research, the differential relationships between these specific emotions and variables that are associated with mental health can be assessed.

#### ***1.3.4. Distinction Between Emotion Generation and Emotion Regulation***

In terms of ER, it is important to note that different theoretical perspectives have different views on whether emotion generation and emotion regulation can be understood as separate processes (Gross & L. F. Barrett, 2011). Discrete emotion theorists view the generation of emotion as coming from more primitive areas of the brain such as the limbic system (Sarkheil et al., 2019), and this is regulated using more evolved parts of the brain such as the prefrontal cortex (Silvers & Moreira, 2019), and therefore these are completely distinct processes. On the other hand, constructivists argue that there is no distinction between emotion generation and emotion regulation, as emotions are being continually constructed from sensory information (Adolphs et al., 2019). In the middle of the continuum is the appraisal approach, which posits that emotion generation and emotion regulation are related processes (Gross & L. F. Barrett, 2011). That is, an emotion can be regulated while it is unfolding (McRae & Gross, 2020).

#### ***1.3.5. Why Is It Important to Investigate Gender Differences in Emotion Regulation?***

The way that individuals regulate their emotions, and the strategies that they use to do so, can have a significant impact on many different areas of life, such as wellbeing (John & Gross, 2004; McRae et al., 2012b), personal relationships (Gross & John, 2003), income and socioeconomic status (Côté et al., 2010), academic performance (Davis & Levine, 2013;

Ivcevic & Brackett, 2014), and physical health (Appleton et al., 2013; 2014). Similarly, there is an abundance of research demonstrating that the way individuals manage their emotions is related to their mental health (Aldao et al., 2016; Aldao & Nolen-Hoeksema, 2010; Aldao & Nolen-Hoeksema, 2012; Aldao et al., 2010; Berking & Wupperman, 2012; Boland et al., 2019; Garnefski & Kraaij, 2006; Hu et al., 2014; Kashdan et al., 2014; McRae et al., 2012b; Westphal et al., 2017).

Accordingly, it is important to examine the factors which are associated with ER because ER is amenable to change (Bomyea et al., 2020; Denny, 2020; Goldin et al., 2012) and so provides an opportunity for improving mental health. ER strategies are learned skills (Young et al., 2019; Zimmermann & Iwanski, 2014), and so individuals have the potential to learn new ways of managing their emotional responses. Training programmes that aim to build participants' skills in using adaptive ER strategies have been shown to improve ER and have a positive impact on mental health (Bomyea et al., 2020; Denny, 2020; Goldin et al., 2012).

Consequently, this means that ER is a potential avenue for improving mental health and increasing wellbeing. ER training is crucial in efforts to tackle poor mental health, and the more that is known about how ER works, the correlates of ER, and for whom ER is most effective, the more these findings can guide therapeutic interventions for poor mental health and clinical disorders. Modifying ER through targeted interventions can aid efforts to reduce the prevalence of clinical disorders (Cludius et al., 2020). ER could also improve sub-clinical symptoms and promote general wellbeing in the population (Gross et al., 2019). Therefore, it is imperative to understand the caveats in ER in order to guide this clinical work

It is helpful to focus on gender differences in particular, because there is evidence that there are gender differences in both ER and mental health. There are gender differences in variables associated with mental health, such as depression, suicidal ideation, and self-harm

behaviours (H. Chen et al., 2019; Knudson et al., 2020; C. S. Lee & Wong, 2020). There is also evidence that ER can explain some of these gender differences in mental health (Nolen-Hoeksema et al., 1999). Therefore, examining these relationships through the lens of gender differences can help to understand them more deeply.

However, a limitation is that most of the previous research in the field has tended to examine the relationships between gender, ER and mental health in a general manner, by examining general affective states such as mood, stress, and negative emotion. An area which is missing is examining these relationships in an emotion-specific manner. It is important to investigate the relationships between gender, ER, and mental health in an emotion-specific manner for two key reasons. Firstly, males and females may receive socialisation around specific emotions, which may impact how they regulate these specific emotions (L. R. Brody, 1985; Root & Denham, 2010). This means that gender differences in ER may depend on the specific emotion being regulated. Secondly, there is evidence that regulating different emotions, even using the same strategy, may have different relationships with mental health variables (Boland et al., 2019). That is, the regulation of one emotion may have a very different consequence than the regulation of another emotion, even when using the same strategy (Boland et al., 2019). This may indicate that the relationships between gender, ER, and variables associated with mental health may depend on the specific emotional context.

It cannot be assumed that what is known about the regulation of one emotion can be applied to all emotions (Vishkin et al., 2020), and contextual variation in ER may have an impact on its effectiveness (Doré et al., 2016). Tailoring therapies to an individual's needs may help to increase the success of the treatment program for the individual (Z. D. Cohen & DeRubeis, 2018; Fisher & Boswell, 2016; Välimäki & Lantta, 2019). When informing therapeutic practice, it is imperative to understand any factors, and their interaction effects, which may moderate the effectiveness of treatment (Zilcha-Mano, 2019). Two factors which

may have an impact on treatment are (1) the specific emotion being regulated, and (2) the interaction between the gender of the patient and the emotion being regulated.

The present research will build on previous empirical evidence and contribute to the field by examining the relationships between gender, ER, and mental health, in an emotion-specific manner. This may help to understand gender differences in ER, and the relationship between gender, ER, and mental health more deeply, which can guide therapeutic interventions, such as ER training. This information will enhance the development of therapeutic interventions for mental health problems by enabling these programmes to be increasingly tailored to different emotional contexts and thus increase chances of treatment success (Z. D. Cohen & DeRubeis, 2018; Fisher & Boswell, 2016; Zilcha-Mano, 2019).

#### **1.4. Conclusion and Next Steps**

In conclusion, the main perspectives in the emotion and ER literatures were discussed in this chapter. One of the key theoretical debates is whether emotions can be organised into discrete categories, or if they differ only on broad dimensions (L. F. Barrett, 1998; Ekman, 1992). As discussed in this chapter, the available evidence indicates that emotions can be grouped into discrete categories that have continuous gradients (Cowen et al., 2018; Cowen & Keltner, 2017). The process model of ER (Gross, 1998b), and the taxonomy of ER strategies developed by Parkinson and Totterdell (1999) provide useful frameworks for studying the regulation of specific emotions. There are a limited number of studies investigating ER in an emotion-specific manner, but those that have done so have found that (1) specific emotions tend to be regulated using different strategies (Vishkin et al., 2020; Zimmermann & Iwanski, 2014), and (2) the regulation of specific emotions is differentially related to correlates of ER (Boland et al., 2019; Clear et al., 2019), and therefore it is useful to research ER in an emotion-specific manner. As will be discussed in Chapter 2, this is



particularly important when examining gender differences in ER, as there is evidence that males and females may (1) experience specific emotions differently, and (2) be socialised to express specific emotions differently.

It was argued in this chapter that ER has an important impact on mental health. It is imperative that empirical studies investigate which ER strategies are effective and for whom, in order to guide therapeutic interventions for poor mental health (Denny, 2020). One prominent pattern that has emerged in the literature is that there are gender differences in variables associated with mental health (Eaton et al., 2012; Girgus & Yang, 2015; Wetherall et al., 2018). Further, it has emerged that there are also gender differences in the way that emotions are regulated (Garnefski et al., 2004; Zimmermann & Iwanski, 2014).

It is possible that ER is a potential mechanism which explains the gender differences in mental health observed in the literature. The research that has been conducted to date demonstrates that ER at least partially contributes to gender differences in some mental health problems (Nolen-Hoeksema et al., 1999). However, a limitation of the existing literature is that very little work has addressed this issue in an emotion-specific manner, and so it is possible that important effects are being masked. Gender differences in ER and variables associated with mental health, and the lack of emotion-specific research in this area, will be discussed in Chapter 2.

## KEY POINTS FOR CHAPTER 1

1. The empirical evidence indicates that emotions can be organised into discrete categories with ‘fuzzy’ boundaries, and these emotions differ in their subjective experience.
2. There is a lack of research investigating ER in an emotion-specific manner, which is important because the regulation of specific emotions may have different relationships with variables associated with mental health.
3. ER is amenable to change, and finding out more about emotion-specific ER can help to guide therapeutic interventions for poor mental health.

## QUESTIONS FOR SUBSEQUENT CHAPTERS

1. What is the link between gender, ER and mental health? (Chapter 2)
2. What are the different methodological approaches to measuring emotions and ER? (Chapter 3)

## NEXT STEPS

Now that the theoretical literature has been reviewed, the link between gender, ER and variables associated with mental health will be discussed in Chapter 2. There are gender differences in both ER and mental health, and ER may explain some of the gender differences that are observed in these mental health problems. However, very few studies have investigated gender differences in the regulation of specific emotions and its relationship with mental health problems.

## **Chapter 2: Gender Differences in Emotion Regulation and Mental Health**

### **2.1. Chapter Summary**

In Chapter 1, it was established that ER has an important relationship with a number of life areas, including mental health. ER is amenable to change, and participating in ER training can positively impact mental health and clinical disorders. Research has demonstrated that there are prominent gender differences in ER and variables associated with mental health. It is possible that ER may play a role in these observed gender differences in mental health.

Although this issue has been investigated previously, very little research has examined this link in an emotion-specific manner. In Chapter 1 it was proposed that specific emotions exist, and these emotions differ in their subjective experience. Findings regarding gender differences in the use of certain ER strategies are mixed, and a possible reason for this may be the lack of emotion-specific research in this area. Examining gender differences in the regulation of specific emotions is important, because (1) it is possible that gender differences in ER depend on the emotion being regulated and (2) the regulation of specific emotions may be differentially related to mental health problems.

In this chapter, the relationship between gender, ER and variables associated with mental health (depressive symptoms, self-harm behaviour, and suicidal ideation) will be discussed. Firstly, the concepts of sex and gender will be defined, and gender differences in ER will be reviewed, including how this relationship may change throughout development. Next, the link between gender, ER and mental health will be described within the context of Response Styles Theory (Nolen-Hoeksema, 1987), which provides a theoretical framework for understanding gender differences in depression. Finally, the implications of this work for clinical therapeutic interventions will be discussed.

## **2.2. Gender Differences in Emotion Regulation**

### ***2.2.1. Sex and Gender***

The terms ‘sex’ and ‘gender’ are often used interchangeably in research, but there is a distinction between these two concepts. Sex is a biological term, which includes differences in anatomy, physiology, genes, and hormones (J. L. Johnson et al., 2009). Sex is usually distinguished along the male/female binary, although sex exists on a continuum, with some people possessing the sexual markers of both males and females (Fausto-Sterling, 2018).

Gender, on the other hand, is a social concept, which is rooted in the culture and history of a society, and so is fluid and can change over time (J. L. Johnson et al., 2009). Gender refers to the socially-prescribed ideals of ‘maleness’ and ‘femaleness’, and this is related to the societal structure, such as a patriarchal society (J. L. Johnson et al., 2009). As such, the term ‘gender’ is usually preferred in research which acknowledges the role of socialisation and learning on behaviour (i.e., ‘nurture’ rather than ‘nature’) (Brannon, 2016; J. L. Johnson et al., 2009; Meyers-Levy & Loken, 2015). Many different gender groups exist, including individuals who identify as having no gender. The groups that are focused upon in this chapter are males and females.

The term ‘gender’ is used throughout this chapter to reflect that the focus of this research is predominantly on individuals who have been socialised as male or female, rather than being related to sex directly. The term sex is rooted in biological processes, which is not the focus of the present research. In order to truly measure sex, you must measure a range of factors, including chromosomal configuration and reproductive physiology (Brannon, 2016). Gender on the other hand, is self-defined and self-reported by adults. Gender is fluid, and as society changes, the way that gender is defined can change too. As gender can be self-reported, gender was measured in the present research.

Gender roles are related to the concept of gender, and refer to the behavioural norms allocated to males and females in a society, including dress code, mannerisms, posture, and occupation (J. L. Johnson et al., 2009). These gender norms often dictate behaviours on an institutional level, such as in the labour market, education systems, and the division of labour in the household (Weber et al., 2019). Another area which may be influenced by gender roles is the way that males and females experience, express, and regulate their emotions.

### ***2.2.2. Gender and Emotion***

Emotion-specific gender differences can be observed in many areas of emotion research. Females are more likely to express internalised emotions, such as sadness and fear (Allen & Haccoun, 1976; Chaplin, 2015), whereas males are more likely to express externalising emotions such as anger in certain contexts (Archer, 2004), and this gender effect is found from childhood (Chaplin & Aldao, 2013).

In terms of subjective experience, females tend to report negative emotion as more intense and more arousing than do males (Bodrogi et al., 2020; Gross & Levenson, 1995), particularly in response to emotional stimuli depicting social situations (Marchewka et al., 2014), and to aversive pictures such as threatening animals (M. M. Bradley et al., 2001). Specifically, females often report higher levels of sadness and fear (Blanchard-Fields & Coats, 2008; Fischer et al., 2004; Kring & Gordon, 1998), although this may be related to perceived gender norms, rather than representing an objective difference in emotional experience (Grossman & Wood, 1993). There is less evidence for a gender difference in the self-reported experience of anger (Grossman & Wood, 1993), although some studies have found that males report higher levels of anger than do females (Fischer et al., 2004), and young adolescent females suppress anger more than their male counterparts (Cox et al., 2000).

These gender differences may stem from a combination of biological differences between males and females (Breedlove et al., 2010), and gender socialisation of social norms around appropriate emotional behaviour (L. R. Brody, 1997). Firstly, biological processes may play a role. When a developing foetus is exposed to androgens in the womb, this begins to masculinise the body, including the developing brain, and this process creates sexual differentiation between males and females (Breedlove et al., 2010). Sexual dimorphism of the brain has been observed in humans (Sacher et al., 2013; Seitz et al., 2020), which means that males and females have differences in the size and function of certain brain structures (Breedlove et al., 2010). This sexual dimorphism may impact on the emotional experience of males and females. For example, in adolescence, brain areas which are involved in ER and emotional experience (the amygdala and hippocampus) mature at different rates for males and females, which may result in females experiencing more negative emotions (Frere et al., 2020). Similarly, there is evidence for sexual dimorphism of the amygdala, and this may interact with the presence of hormones to contribute to females having a more intense fear response compared to males (Shansky, 2020). Therefore, these biological processes may contribute to gender differences in emotional experience.

Secondly, there is evidence that males and females are socialised to engage with specific emotions in different ways, with fear and sadness being viewed as more ‘feminine’, and anger being viewed as a ‘masculine’ emotion, according to social norms in Western societies (L. R. Brody, 1985; Root & Denham, 2010). Cultural expectations determine the appropriateness of emotional displays for males and females (Root & Denham, 2010). On a societal level, it is generally regarded as less acceptable for females to express anger without experiencing negative consequences (Brescoll & Uhlmann, 2008), and violations of these gender roles can be met with hostility and intolerance (Sanborn-Overby & Powlishta, 2020).

Furthermore, parents play a pivotal role in emotion socialisation, and evidence from parenting research indicates that parents respond in different ways to a child's emotion, based on the child's gender and the specific emotion (Root & Denham, 2010). Parents tend to talk about anger more often with their sons, but talk about sadness more often with their daughters (Fivush, 1989). Parents also express more positive emotions to their daughters, but express more anger towards their sons (Eisenberg et al., 1998). Finally, fathers are more likely to reward their daughters and punish their sons for expressing sadness and fear (Garside & Klimes-Dougan, 2002).

Biological differences and cultural socialisation are intrinsically linked, as gender differences in emotional behaviour which are driven by biological processes, however small, may be amplified and shaped by social learning (Breedlove et al., 2010). Individuals are taught essential social rules about specific emotions, particularly sadness, anger and fear. Thus, it is possible that males and females may regulate their specific emotions in different ways, based on an interaction between biological differences in the experience of emotion, and the rules learned through gender socialisation (Chaplin, 2015; Wager & Ochsner, 2005). However, at the present time, very few studies have examined gender differences in the regulation of specific emotions.

### ***2.2.3. Gender Differences in Emotion Regulation***

As defined in Section 1.3.1, ER refers to the processes by which we influence our emotional experience, including which emotions we have, when we have them, and how we experience and express these emotions (Gross, 2015a). In this section, the empirical evidence for gender differences in ER will be reviewed.

**2.2.3.1. Gender Differences in Coping.** As a concept, ER evolved from the coping literature (Gross, 1998b, 1999), and through research, gender differences in coping have been

found. Females are more likely to use emotion-focused coping (Brougham et al., 2009; Folkman & Lazarus, 1980), whereas males tend to use problem-focused coping (Pearlin & Schooler, 1978). This means that during a stressful situation, females focus on changing the emotional response to the stressor (e.g., venting emotions to others or ruminating), whereas males attempt to change the stressor directly (e.g., through problem solving or planning) (Lazarus & Folkman, 1984), although the findings from the ER literature have been more tentative, as discussed in Section 2.2.3.7.

This greater use of emotion-focused coping may reflect the finding that females tend to use cognitive ER more and rely on a wider variety of ER strategies compared to males, in adolescence (Sanchis-Sanchis et al., 2020) and in adulthood (Garnefski et al., 2004; Nolen-Hoeksema & Aldao, 2011; Thoits, 1991). The gender difference in emotion-focused coping may also point to a tendency for females to be more open to responding to and coping with their emotions, and for males to be less willing to focus on emotions. Females are more likely to pay attention to their emotions during regulation (Thayer et al., 2003), and are more likely to ruminate on an emotional situation (Nolen-Hoeksema & Aldao, 2011; Trives et al., 2016), whereas males are more likely to use avoidance and passivity to regulate negative emotion (Zimmermann & Iwanski, 2014).

**2.2.3.2. Gender Differences in Reappraisal.** As defined in Section 1.3.2.1, reappraisal involves changing the meaning of a situation in order to lessen the resulting emotional response, and is a key strategy in Gross's (1998b) process model of ER. Reappraisal is regarded as an adaptive ER strategy, as it is effective at reducing negative emotion in a laboratory session (Gross, 1998a, 2002) and is associated with positive correlates, such as wellbeing (John & Gross, 2004; McRae et al., 2012b).

The findings regarding gender differences in reappraisal are mixed. Some studies have found that when reappraisal frequency is measured through self-report questionnaires,



females are more likely to use reappraisal to regulate their emotions compared to males (R. C. Martin & Dahlen, 2005; Smrtnik-Vitulić & Prosen, 2016; Spaapen et al., 2014), and this is consistent across adolescence (Gullone et al., 2010) and adulthood (Nolen-Hoeksema & Aldao, 2011).

In contrast, one study found that adolescent males reported using reappraisal more than females (Öngen, 2010). Males also report using positive reappraisal more than females (Esmailinasaba et al., 2016). Positive reappraisal is a subtype of reappraisal that involves viewing a situation in a positive light. More generally, reappraisal can also involve reinterpreting the meaning of a situation neutrally, such as describing a clinical procedure in unemotional medical terms. This finding may indicate that the specific technique used to reappraise, or the content of the reappraisal, may play a role in moderating gender differences in reappraisal, with males potentially being more likely to use positive appraisals, and females being more likely to use wider neutral appraisals.

Furthermore, some studies have found no gender difference in the use of reappraisal (Garnefski et al., 2004; Gross & John, 2003; Haga et al., 2009; Zlomke & Hahn, 2010). These studies were mostly conducted with undergraduate students, and so may highlight a difference between student and non-student populations, which has been found in psychological research more generally (Gordon et al., 1986).

However, another potential source of these mixed findings in the use of reappraisal may be that the self-report questionnaires used in these studies measure reappraisal in an emotion-general way, and so emotion-specific nuances are missed. For example, the Emotion Regulation Questionnaire (Gross & John, 2003) measures the habitual use of reappraisal to regulate both positive and negative emotion, and no differentiation is made between specific emotions. It may be the case that clearer findings emerge when the use of reappraisal to

regulate specific emotions is examined. This will be discussed further in Chapter 3, which outlines the methodological approach used in the present research to address this issue.

**2.2.3.3. Gender Differences in Suppression.** Expressive suppression involves keeping the facial expression neutral while experiencing an emotion, and it acts on the emotional response once it has fully developed (Gross, 1998a). Suppression is associated with negative consequences (Gross, 1998a, 2002), and so is generally regarded as a maladaptive ER strategy (Aldao et al., 2010).

Gender differences in suppression have been robustly reported in the ER literature, with males tending to report using suppression more than females (Gross & John, 2003). This has been found within community samples of adults (Spaapen et al., 2014; Zimmermann & Iwanski, 2014), undergraduate students (Gross & John, 2003; Haga et al., 2009; Kwon et al., 2013; Melka et al., 2011), and with children and adolescents (Gullone et al., 2010; Gullone & Taffe, 2012; Larsen et al., 2013; Zimmermann & Iwanski, 2014). One study of adults aged 20-65 years old found no gender difference in suppression (Smrtnik-Vitulić & Prosen, 2016).

However, the gender difference in suppression can change with age. Nolen-Hoeksema and Aldao (2011) found that older females were marginally more likely to use suppression than older males, which indicates that the relationship between gender and suppression may change throughout the lifespan. Overall, males tend to be more likely than females to report using suppression to regulate their emotions (Zimmermann & Iwanski, 2014), although this may be modulated by age (Nolen-Hoeksema & Aldao, 2011).

The gender difference in suppression may also depend on the emotion being regulated. Research has found that females are more likely than males to suppress anger, and this has been found both in adolescents (Cox et al., 2000) and in adults (Kwon et al., 2013). Therefore, it may be possible that females suppress anger more than males, but males tend to use suppression more than females overall. This further highlights the importance of

investigating gender differences in ER in an emotion-specific manner to clarify these mixed findings.

**2.2.3.4. Gender Differences in Rumination.** Rumination refers to persistently focusing attention onto the causes, meanings, or consequences of an emotion or emotional situation without engaging in adaptive problem solving (Nolen-Hoeksema et al., 1993; Nolen-Hoeksema et al., 2008). Rumination is a maladaptive strategy, and reliance on rumination has been implicated in contributing to depression (Nolen-Hoeksema, 1991), which will be discussed further in Section 2.3.4.1.

There is strong evidence of gender differences in rumination, with females being more likely to ruminate than males. This finding has been consistently reported in research with adults (Ando et al., 2020; Garnefski et al., 2004; Nolen-Hoeksema & Aldao, 2011; Thomsen et al., 2005; Trives et al., 2016; Zimmermann & Iwanski, 2014), and with undergraduate students (Thayer et al., 2003; Zlomke & Hahn, 2010). In a meta-analysis of over 14,000 adults, females were found to ruminate more than males, including both brooding, which involves self-focused thought that is maladaptive in nature, and reflection, which is a more neutral and adaptive strategy (D. P. Johnson & Whisman, 2013).

Similarly, in adolescence, girls are more likely to ruminate compared to boys (Gomez-Baya et al., 2016; Hilt et al., 2010; Nolen-Hoeksema, 2001; Rood et al., 2009), and this gender difference emerges in children as young as 9 years old (Jose & Brown, 2008; Sanchis-Sanchis et al., 2020). The use of rumination increases for females, but not for males, across adolescence (Gomez-Baya et al., 2016), and gender differences in rumination are consistent across the lifespan (Nolen-Hoeksema & Aldao, 2011; Trives et al., 2016; Zimmermann & Iwanski, 2014). These gender differences in rumination are aligned with the findings from the coping literature discussed in Section 2.2.3.1, that females are more likely to use emotion-focused coping than males, because rumination is an example of emotion-

focused coping. The implications of this greater use of rumination amongst females may be a risk factor for the development of clinical disorders, particularly depression, which will be discussed in Section 2.3.4.

**2.2.3.5. Gender Differences in Distraction.** Distraction is an ER strategy which involves diverting attention away from the emotional situation, and doing or thinking something that is unrelated instead. Distraction is generally regarded as an adaptive strategy (Dörfel et al., 2014; McRae et al., 2010), but this can depend on whether it involves an attitude of acceptance or avoidance (Wolgast & Lundh, 2017). It is common for distraction to be used as a way of coping with difficult life circumstances, particularly through activities such as gaming (Caro & Popovac, 2020). The findings regarding gender differences in distraction are mixed. Amongst adults, males are more likely than females to use distraction when they are feeling sad or depressed (Trives et al., 2016). Conversely, females are more likely to choose to distract (rather than ruminate) from anger, but this was not the case for males (Rusting & Nolen-Hoeksema, 1998).

Similarly, in adolescents aged 12-15, males used distraction in response to a low mood more than females (Gomez-Baya et al., 2016), and adolescent males are more likely to use distraction to cope with stress (Copeland & Hess, 1995). In an undergraduate sample, males were also more likely to use positive refocusing, a type of distraction which involves focusing attention on to positive things which are unrelated to the emotional situation (Esmaeilinasaba et al., 2016).

However, other studies with adults have found that females are more likely to use positive refocusing (Garnefski et al., 2004), although this was a small effect, and some studies have found no gender differences in positive refocusing amongst undergraduate students (Zlomke & Hahn, 2010).

Overall, it is unclear whether gender differences exist in the use of distraction. However, clear gender differences tend to emerge when a specific emotion is focused upon, such as low mood (which is similar to sadness) in Trives et al. (2016), and anger in Rusting and Nolen-Hoeksema (1998). Studies that find no gender differences, such as Zlomke and Hahn (2010), tend to focus on general emotion. It may be the case that males use distraction to regulate feelings of sadness and stress more and females use distraction more for anger, but this gender difference is obscured by examining aggregate emotions. Therefore, a clearer picture regarding gender differences may emerge when distraction is examined in an emotion-specific manner.

**2.2.3.6. Gender Differences in Engagement and Disengagement ER.** Gender differences in the use of ER strategies such as reappraisal, suppression, rumination, and distraction were reviewed in the previous sections. When examining the literature as a whole, some patterns relating to gender differences in ER can be observed. Females tend to use strategies that involve engaging with their emotions, such as rumination (D. P. Johnson & Whisman, 2013; Nolen-Hoeksema & Aldao, 2011; Zlomke & Hahn, 2010). There is some evidence that males are more likely to use strategies that involve diverting attention or disengaging from their emotions, such as avoidance or distraction (Trives et al., 2016; Zimmermann & Iwanski, 2014). The hypothesis that there are gender differences in engagement and disengagement ER has not been tested in the ER literature, and has not been examined in an emotion-specific manner.

**2.2.3.7. Other Gender Differences in Emotion Regulation.** The strategies reviewed so far were chosen because they represent some of the key ER strategies researched in the field. However, gender differences have emerged in other ER strategies, although there are some nuances in these gender differences. Generally, females tend to use cognitive strategies more than males, such as catastrophising (Garnefski et al., 2004), or reframing situations by

putting things into perspective (Zlomke & Hahn, 2010). When females take action to regulate their emotions, they are more likely than males to turn to others for social support (Zimmermann & Iwanski, 2014).

In contrast, one study found that males are more likely to focus on planning to regulate negative emotion, which involves thinking about what action to take to deal with the negative event (Esmaeilinasaba et al., 2016). However, compared to males, adolescent females were more likely to use problem solving (Hilt et al., 2010), and adult females were more likely to use active coping to regulate negative emotion (Nolen-Hoeksema & Aldao, 2011), which involves taking action to make a situation better and so is similar to problem solving. Furthermore, other studies have found no gender differences in problem solving (Trives et al., 2016) or refocus on planning (Garnefski et al., 2004; Zlomke & Hahn, 2010). Therefore, the findings regarding problem solving are tentative, and it may be the case that gender differences in the use of problem solving are moderated by different factors such as the type of situation (Tamres et al., 2002) or age (Nolen-Hoeksema & Aldao, 2011). As discussed throughout this chapter, it may also be the case that gender differences in problem solving depend on the specific emotion being regulated.

In terms of avoidance, males may be more likely to use ER strategies which involve avoiding their emotional experience, and this gender difference is found across the lifespan (Zimmermann & Iwanski, 2014). However, this may depend on situational factors. One study found that in adolescence, females were more likely to use experiential avoidance overall, although males used avoidance more in response to external stressors, such as frustrating experiences with peers (Xavier et al., 2018). Therefore, the use of avoidance may depend on the context of the emotional situation, particularly for adolescents.

**2.2.3.8. Gender Differences in Emotion-Specific Emotion Regulation.** Few studies have explored gender differences in the regulation of multiple specific negative emotions.

However, a study by Rivers et al. (2007) investigated gender differences in the regulation of sadness and anger. ER was measured using a qualitative method, which involved participants free-writing about what they did to reduce feelings of anger or sadness while having a conflict with a friend. These text responses were subsequently coded into ER strategies. This method is similar to the approach used in the present research, which will be described in Section 3.5.2.1, although the resulting strategies that emerged from this method were different.

In Rivers et al. (2007), no gender differences were found in the regulation of sadness or anger using the strategies focused upon in the study. However, a limitation of the study by Rivers et al. (2007) is that it did not measure some of the most commonly-researched strategies in the literature, for which gender differences have been found in other studies, such as reappraisal, suppression, rumination or distraction (Gomez-Baya et al., 2016; Nolen-Hoeksema & Aldao, 2011; Zimmermann & Iwanski, 2014). It is possible that gender differences in emotion-specific ER may emerge when these strategies are examined. Further, the ER measured by Rivers et al. (2007) was tied to the context of interpersonal conflict. It may be the case that ER is different in other, more general contexts.

In addition, Sanchis-Sanchis et al. (2020) investigated gender differences in adolescents' use of ER to regulate sadness, anger, and anxiety. Males and females did not differ on emotion-general ER. However, when specific emotions were measured, females used both internal (e.g., reappraisal) and external (e.g., seeking social support) ER more than males to regulate sadness and anxiety. Emotion-specific gender differences in individual strategies were not reported. Therefore, whether gender differences in emotion-specific ER are found may depend on (1) the method used to measure ER (which will be discussed in Chapter 3), and (2) the ER strategies measured in emotion-specific research.

**2.2.3.9. Gender Differences in Emotion Regulation Summary.** Overall, there is evidence that gender differences in ER exist, with males and females often approaching the regulation of negative emotion in different ways. Females are more likely to use strategies which involve engaging with the emotion or emotional situation, such as rumination (D. P. Johnson & Whisman, 2013), whereas males tend to use strategies which involve disengaging with the emotion or emotional situation, such as distraction, avoidance and suppression (Trives et al., 2016; Zimmermann & Iwanski, 2014).

Furthermore, for some ER strategies, such as reappraisal and distraction, the findings regarding gender differences tend to be mixed. This may be due to the fact that most of the studies that investigate the relationship between gender and ER tend to do so in an emotion-general manner, by measuring an aggregate of negative emotions without distinguishing between specific emotions. When gender differences in ER have been investigated in an emotion-specific manner, such as in Trives et al. (2016), clear gender differences have emerged. Therefore, investigating gender differences in the use of these strategies to regulate specific emotions may bring clarity to the relationship between gender and ER.

## **2.3. Gender, Emotion Regulation, and Mental Health**

### ***2.3.1. Definition of Variables Associated with Mental Health***

In this chapter, mental health is defined in a broad sense, which includes (1) sub-clinical symptomatology measured in a community sample, (2) diagnoses of clinical disorders such as depression, bipolar disorder, and generalised anxiety disorder, (3) behaviours which are linked with poor mental health, such as self-harm and suicidal ideation (O'Connor & Nock, 2014), (4) wellbeing, which is regarded as a marker of mental health (McKay & Andretta, 2017), and (5) stress, which is associated with poor mental health



(Valikhani et al., 2019). In this thesis, depressive symptoms, suicidal ideation, and self-harm behaviours are referred to as variables associated with mental health.

With regards to self-harm, there is an ongoing debate in the literature as to the best way to conceptualise self-harm behaviours. One area of contention relates to whether behaviours should be separated based on their intention. Some researchers distinguish between behaviour such as suicide attempts and non-suicidal self-injury (NSSI), which refers to engaging in self-harm behaviours without the intention of suicide (Andover et al., 2010; Bresin & Schoenleber, 2015; Sornberger et al., 2012). However, as highlighted in Kapur et al. (2013), there is little evidence to support this distinction.

There is a strong association between self-harm and suicide attempts (Duarte et al., 2020). Self-harm is one of the biggest risk factors for future suicide attempts (Andover et al., 2012; Mars et al., 2019; O'Connor et al., 2018). Also, a large proportion of individuals who self-harm report experiencing suicidal ideation while engaging in self-harm behaviours (Klonsky, 2011; Madge et al., 2008). These findings demonstrate that it is difficult to know the intent behind self-harm behaviours with any degree of confidence, and making the distinction between self-harm with and without suicidal intention creates a false dichotomy (Kapur et al., 2013).

For this reason, when referring to the present research, the term self-harm will be used, which is referring to self-harm irrespective of the intention. This is reflected in the measure of self-harm used in the present research (Deliberate Self-Harm Inventory, DSHI; Gratz, 2001), which asks participants both about their experiences of self-harm without suicidal intent (e.g., Have you ever intentionally (i.e., on purpose) cut your wrist, arms, or other area(s) of your body (without intending to kill yourself)?), and their experiences of self-harm without specifying any intention (e.g., Have you ever intentionally (i.e., on purpose)

done anything else to hurt yourself that was not asked about in this questionnaire? If yes, what did you do to hurt yourself?).

Individuals often report a mix of different intentions when engaging in self-harm behaviours (Boergers et al., 1998; Hawton et al., 1982; Hawton et al., 2012; Madge et al., 2008), and so it is likely that the DSHI captures a mix of motives, as many of the questions do not specify intent. Although the authors of the DSHI claim that it measures self-harm without suicidal intent, i.e., NSSI (Gratz, 2001), it is argued that the DSHI is likely to measure self-harm both with and without suicidal intent. In the present research, self-harm is defined as all self-injurious behaviours, regardless of the motive or extent of suicidal intent (Hawton et al., 2012).

In the present research, when referring to studies where this distinction has been made, the language of the study (e.g., NSSI) will be adopted to ensure clarity. This is because the conceptualisation of self-harm in this way will impact on the way it is measured. However, when referring to the present research, the term self-harm (irrespective of suicidal intent) will be adopted.

In addition to self-harm (irrespective of intent), suicidal ideation will also be measured in the present study, which refers to having thoughts about suicide. Suicidal ideation is a central predictor of future suicide risk (O'Connor & Nock, 2014), and so it is important to examine factors which may be related to having suicidal thoughts (such as ER). As will be discussed in this chapter, there are also gender differences in suicidal ideation. Therefore, in the present research self-harm behaviours regardless of intent, and suicidal thoughts, will be measured.

### ***2.3.2. Gender Differences in Variables Associated with Mental Health***

It is estimated that almost a billion people suffer from poor mental health worldwide (Dattani et al., 2021). Globally, approximately 280 million people are affected by depression, and more than 700,000 people die by suicide each year (World Health Organisation, 2021b, 2021c). Many gender differences are observed in these mental health problems and clinical disorders. Females often have a higher prevalence of internalising disorders, such as mood and anxiety disorders, whereas males have higher rates of externalising disorders, such as personality disorders (Eaton et al., 2012). Although self-harm behaviours are not a mental health problem, people with a diagnosis of a clinical disorder are much more likely to attempt suicide or die by suicide (Mental Health Foundation, 2016), and so self-harm behaviours are closely related to mental health. Gender differences in depression, self-harm, and suicidal ideation will be discussed in the following sections.

**2.3.2.1. Gender Differences in Depression.** Females are over twice as likely to experience depression compared to males (H. Chen et al., 2019; Eaton et al., 2012; Girgus & Yang, 2015; Hankin et al., 1998; Kessler, 2003; Kunst et al., 2019; Marcus et al., 2005; Nolen-Hoeksema, 1987, 2001; Nolen-Hoeksema & Aldao, 2011; Nolen-Hoeksema et al., 1999; Van de Velde et al., 2010; Weissman et al., 1996; Wetherall et al., 2020). Females have a higher lifetime prevalence of depression, with almost a quarter (22.9%) of females compared to 13.1% of males experiencing depression at some point during their lifetime (Eaton et al., 2012). Across the lifespan, females are estimated to be twice as likely as males to receive a diagnosis of clinical depression, and females demonstrate twice as many depressive symptoms as do males (Girgus & Yang, 2015).

This higher prevalence of depression amongst females is found across different cultures (H. Chen et al., 2019; Van de Velde et al., 2010; Weissman et al., 1996), age groups (Hankin et al., 1998), and in both community and clinical samples (Marcus et al., 2005;

Nolen-Hoeksema et al., 1999). Females have higher rates of both clinical diagnoses of depression and subclinical symptoms of depression (Nolen-Hoeksema, 2001). Amongst people with a diagnosis of depression, females are more likely than males to have a relapse after 7 months (Kuehner, 1999).

Depression begins to emerge in childhood and increases in prevalence during adolescence (Nolen-Hoeksema, 1994; Salk, Hyde, & Abramson, 2017). Gender differences in depression also emerge at this stage (Nolen-Hoeksema, 1994; Nolen-Hoeksema & Girgus, 1994). In a study by Hankin et al. (1998) the development of depression from adolescence into young adulthood was assessed longitudinally across a 10-year period. Although males initially had slightly higher levels of depression at age 11, females began to have higher levels of depression at age 15, which continued to increase into adulthood (Hankin et al., 1998). This demonstrates that depressive symptoms may develop at a higher rate for females compared to males.

Across adulthood, females consistently have higher rates of depression than males. In a large community sample of 7,485 participants, depressive symptoms were measured in young, middle-aged, and older adults (Leach et al., 2008). Females had higher levels of depression than males in all of the age groups. Nolen-Hoeksema and Aldao (2011) also found that depressive symptoms are consistently higher for females across adulthood. Therefore, there is strong evidence that females tend to have higher rates of depression than males in adolescence and in adulthood.

**2.3.2.2. Gender Differences in Self-Harm and Suicidal Ideation.** There is also evidence for gender differences in self-harm behaviours (Hawton, 2000). In Scotland, females are more likely to self-harm than males, with 9% of Scottish adult females reporting engaging in self-harming without suicidal intent compared to 5% of males (Knudson et al., 2020). This gender effect is particularly pertinent in adolescence, with adolescent females

being at least three times, and up to six times more likely to report self-harming regardless of the intention, compared to their male counterparts (Hawton et al., 2012; Madge et al., 2008; O'Connor et al., 2009). In a large study of 2008 Scottish school pupils aged 15-16 years old, 5.1% of boys, and 13.6% of girls reported self-harming irrespective of intent, in the past year (O'Connor et al., 2009). In terms of lifetime prevalence, almost 20% of girls in the sample and 6.9% of boys reported a lifetime prevalence of self-harm (O'Connor et al., 2009). Similarly, in the Child and Adolescent Self-Harm in Europe (CASE) study of over 30,000 adolescents across 7 countries, self-harm irrespective of the intention was over twice as common in females as in males (Madge et al., 2008).

In terms of NSSI, which refers to the measurement of self-harm without suicidal intent, females in North America are 1.5 times more likely to engage in NSSI than males (Bresin & Schoenleber, 2015). Females report that they began to engage in NSSI at a younger age (aged 11.57 years on average) compared to males (aged 13.83 years old on average) (Andover et al., 2010). In 2018/2019, 22% of Scottish females aged 16-24 reported self-harming without suicidal intent, compared to 9% of males in this age group (Knudson et al., 2020). This gender difference is most prominent in the youngest age group and decreases across the lifespan (Knudson et al., 2020). Self-harm without suicidal intent tends to decrease with age, and is least prevalent in older age groups (McManus et al., 2019).

When asked whether they had ever attempted to take their own life, 9% of adult females compared to 6% of males in Scotland reported ever attempting suicide by taking an overdose, or through other means (Knudson et al., 2020). Amongst undergraduate students, females are more likely than males to report attempting to take their own life (Sivertsen et al., 2019). Gender differences in self-harm with suicidal intention begin to emerge in adolescence, with adolescent females being twice as likely to report self-harming with

suicidal intention than their male counterparts (C. S. Lee & Wong, 2020; Lewinsohn et al., 2001).

There is also evidence that females are more likely than males to report having thoughts about suicide (Hunt et al., 2006; C. S. Lee & Wong, 2020; Sivertsen et al., 2019; Stephenson et al., 2006). This gender difference may depend on age, as females were found to report higher suicidal ideation than males amongst young adults, but this was not found in older adults (Hunt et al., 2006), suggesting that this gender difference may disappear as people get older. However, in contrast to this, in a study of Scottish young people aged 18-34, males were more likely to have suicidal thoughts but not attempt suicide, whereas females were more likely to attempt suicide (Wetherall et al., 2018). This may indicate that gender differences in suicidal ideation may vary by culture.

Although some studies have found no gender differences in self-harm regardless of intent (Lundh et al., 2007), this may be due to the measure of self-harm used. When different methods of self-harm are distinguished and measured separately, clear gender differences emerge, with females being more likely to use cutting methods (Lundh et al., 2007), and males tending to use hitting or burning behaviour (Andover et al., 2010; Idig-Camuroglu & Gölge, 2018). Further, studies which fail to find gender differences in self-harm tend to be conducted in countries outside of Scotland and the UK, and there is evidence that there are cultural differences in self-harm and suicide rates (Brock et al., 2006; Madge et al., 2008), as well as differences in the measurement of self-harm (Kapur et al., 2013), as highlighted in Section 2.3.1.

However, there is a gender paradox in self-harm behaviour. Compared to males, females are more likely to engage in self-harm behaviour with or without suicidal intent (Hawton et al., 2012; Madge et al., 2008; Miranda-Mendizabal et al., 2019; O'Connor et al., 2009; Wetherall et al., 2018). However, males are more likely to die by suicide (National

Records of Scotland, 2021). In 2020, 71% of the people in Scotland who died by probable suicide were male (National Records of Scotland, 2021). This gender difference is a robust finding (Dougall et al., 2017; Miranda-Mendizabal et al., 2019; P. L. Mok et al., 2012; Stark et al., 2004) that is found across different age groups (S. Lee et al., 2019) and cultures (Jordan & McNiel, 2020; S. Lee et al., 2019; Mościcki, 1994). One theory for this gender paradox is that although females are more likely to attempt suicide, males tend to use more lethal methods of suicide, and so this may explain why death by suicide is more common amongst males (Ajdacic-Gross et al., 2008).

Overall, there are prominent gender differences in variables relating to mental health. Females have higher rates of depression and self-harm behaviour, irrespective of suicidal intent. However, males are more likely to die by suicide. There are many factors which contribute to poor mental health, including biological, social, and psychological influences (Parker, 2019). However, one factor which impacts on mental health is ER, which will be discussed in the next section.

### ***2.3.3. The Relationship Between Emotion Regulation and Variables Associated with Mental Health***

The way that emotions are regulated is closely related to mental health, including subclinical symptomatology (Garnefski & Kraaij, 2006; Gonçalves et al., 2019), clinical disorders (Aldao et al., 2010; S. J. Bradley, 1990; Cludius et al., 2020; Dryman & Heimberg, 2018; Fitzgerald et al., 2019; Sheppes et al., 2015), markers of poor mental health such as stress and wellbeing (McRae et al., 2012b; Zahniser & Conley, 2018), and behaviours which are associated with poor mental health, such as self-harm and suicidal ideation (Albanese et al., 2019; Brereton & McGlinchey, 2020). The relationship between reappraisal, suppression and variables associated with mental health will be discussed in the following sections, before

describing Response Styles Theory, which addresses the relationship between rumination, distraction, and depression.

**2.3.3.1. Reappraisal and Mental Health.** There is a large body of work which demonstrates that reappraisal may have a positive impact on mental health (Aldao et al., 2010). In correlational research, less frequent reappraisal is associated with higher levels of depressive symptoms amongst adults (Aldao et al., 2010; Garnefski & Kraaij, 2006; Hu et al., 2014), adolescents (Garnefski & Kraaij, 2006; Shapero et al., 2019) and undergraduate students (Gross & John, 2003; Haga et al., 2009; R. C. Martin & Dahlen, 2005). More frequent use of reappraisal is also linked with lower levels of social anxiety (Kivity & Huppert, 2019), general anxiety, and stress (R. C. Martin & Dahlen, 2005) in community samples.

These correlational findings are supported by prospective evidence. In undergraduate students, reappraisal predicts lower depressive symptoms, stress and anxiety (Brewer et al., 2016; Zahniser & Conley, 2018), and higher self-efficacy, hope and resilience (which are markers of wellbeing) over the academic year (Brewer et al., 2016). These findings indicate that reappraisal may buffer against the development of internalising symptoms such as anxiety and depression amongst undergraduate students.

There is also evidence that reappraisal is related to experiencing fewer clinical symptoms in diagnoses of clinical disorders. In cross-sectional research, using reappraisal less often is associated with higher depressive symptoms (Garnefski & Kraaij, 2006) and lower wellbeing (Kraiss et al., 2020) amongst people with any clinical diagnosis. Similarly, individuals with clinical depression (Kanske et al., 2012) and bipolar disorder (Kjærstad et al., 2016) are less effective in using reappraisal to downregulate amygdala responses to emotional stimuli compared to control groups.



Longitudinally, amongst individuals diagnosed with bipolar disorder, reappraisal predicted a decrease in depression 12 months later, while controlling for baseline levels of depression (S. L. Johnson et al., 2016). These findings show that reappraisal may be linked with lower symptoms amongst those with a clinical disorder, and prospective evidence may implicate reappraisal as a protective factor against the development of depressive symptoms.

Reappraisal is also associated with behaviours that are related to poor mental health, such as self-harm (T. S. Davis et al., 2014), or having thoughts about suicide (Kudinova et al., 2016). Adults with a history of self-harm regardless of intent were less effective at reducing sadness using reappraisal during an emotion regulation task, compared to people with no history of self-harm, even while controlling for depressive symptoms (T. S. Davis et al., 2014). However, the use of reappraisal has been found to reduce negative emotion amongst individuals who engage in self-harm behaviours (In et al., 2021).

In terms of suicidal ideation, one study used electroencephalography (EEG) to measure the late positive potential (LPP), an event-related potential which represents attention to emotional stimuli (Kudinova et al., 2016). Individuals with a history of suicidal ideation had a higher LPP after being asked to use reappraisal compared to those with no history of suicidal ideation, which demonstrates that the individuals with a history of suicidal ideation may have had more difficulty implementing reappraisal during the task (Kudinova et al., 2016). These findings demonstrate that being less skilled in the use of reappraisal may be associated with higher levels of self-harm and suicidal ideation.

Overall, these findings indicate that frequent and effective use of reappraisal is generally associated with greater mental health, both in clinical and sub-clinical samples, and longitudinal research may implicate reappraisal as a contributing factor to mental health.

**2.3.3.2. Suppression and Mental Health.** As with reappraisal, suppression has also been linked with mental health in the literature, although suppression is generally regarded as

a maladaptive strategy (Aldao et al., 2010). In correlational research, greater use of suppression is associated with higher depressive symptoms amongst adults (Hu et al., 2014) and undergraduate students (Haga et al., 2009). Using suppression more frequently is also associated with higher anxiety and negative affect, whereas less use of suppression is associated with positive affect and higher life satisfaction (Hu et al., 2014). The link between suppression and mental health is stronger in Western cultures (Hu et al., 2014).

Longitudinally, the use of suppression predicts higher sub-clinical symptoms of depression and anxiety amongst undergraduates across the academic year, while controlling for stress (Zahniser & Conley, 2018). Similarly, in a community sample of adults, greater use of suppression at baseline predicted lower psychological wellbeing 2.5 years later (Kelley et al., 2019). Conversely, one study found that suppression did not predict anxiety and depression longitudinally, although it was associated with lower life satisfaction after 8 months, which is a marker of wellbeing (Brewer et al., 2016).

In terms of self-harm and suicidal ideation, suppression was associated with higher levels of suicidal ideation amongst individuals with a diagnosis of a clinical disorder, while controlling for symptoms of depression (Forkmann et al., 2014). Furthermore, females with a diagnosis of borderline personality disorder who used suppression to reduce feelings of sadness during an experimental task did not report an increase in the urge to self-harm (Svaldi et al., 2012). In the same study, those who used acceptance did have an increase in the urge to self-harm five minutes later (Svaldi et al., 2012), which indicates that suppression may have an adaptive role amongst this group. Many theorists suggest that self-harm may be a technique used by individuals to avoid negative emotion (Chapman et al., 2006; Klonsky, 2007; Slee et al., 2008). Therefore, it may be beneficial to examine if the regulation of specific emotions is differentially associated with self-harm and suicidal ideation.

#### ***2.3.4. Explaining Gender Differences in Depression: Response Styles Theory***

As described in Section 2.3.2.1, there are prominent gender differences in depression. Response styles theory (RST) (Nolen-Hoeksema, 1987) is a theoretical framework which attempts to explain these gender differences. There are many different theories of why gender differences in depression exist, including gender differences in biological processes (Albert, 2015), gender roles (Rosenfield, 1980), and levels of stress (Nolen-Hoeksema et al., 1999). However, an advantage of RST is that it takes response styles into account in explaining the relationship between gender and depression. Response styles are the different ways that individuals can respond to experiencing a depressed mood, and this is closely related to ER. That is to say, the ER strategies used in this context of a low mood, such as rumination, are a type of response style. We know from the review of the literature in this chapter that (1) there are gender differences in ER, and (2) ER may be a contributor to mental health. Therefore, RST was focused upon in the present research as it is the only theory which takes the role of ER into account when attempting to explain gender differences in the prevalence of depression.

According to RST, the way that individuals respond to a depressed mood can contribute to the onset and maintenance of depression (Nolen-Hoeksema, 1987, 1991; Nolen-Hoeksema et al., 1999; Nolen-Hoeksema et al., 1993; Nolen-Hoeksema et al., 2008). Certain response styles, such as distraction and problem solving, are regarded as adaptive and result in lower depressive symptoms. On the other hand, ruminating in response to a low mood is expected to contribute to and exacerbate depression.

ER can be regarded as a trans-diagnostic process, which means that the impact of ER spans across different clinical disorders (Aldao et al., 2016; Cludius et al., 2020). ER strategies, such as rumination, have been shown to contribute to a wider range of psychopathologies than initially thought, such as anxiety, binge eating, and self-harm (Nolen-

Hoeksema et al., 2008). Other ER strategies such as reappraisal and suppression have also been shown to impact many aspects of mental health and associated behaviours (Aldao et al., 2010). Therefore, it is proposed that the principles of RST can be applied to other variables that are associated with mental health (such as depressive symptoms, self-harm behaviours, and suicidal ideation), and can provide a framework for understanding the relationship between gender, ER and these variables more widely. It is possible that gender differences in ER may contribute to gender differences in variables associated with mental health. Further, no known studies to date have examined this in an emotion-specific manner.

According to RST, females are more likely to ruminate in response to a depressed mood, and this will result in higher rates of depression amongst females (Nolen-Hoeksema et al., 1999). Conversely, males are more likely to use distraction and problem solving in response to a low mood, which will result in lower levels of depression (Nolen-Hoeksema, 1991). This means that regardless of the source of depressive symptoms (whether it is biological or psychological), the approach that males take in responding to these feelings may be more adaptive and result in less depressive symptoms compared to females (Nolen-Hoeksema, 1987).

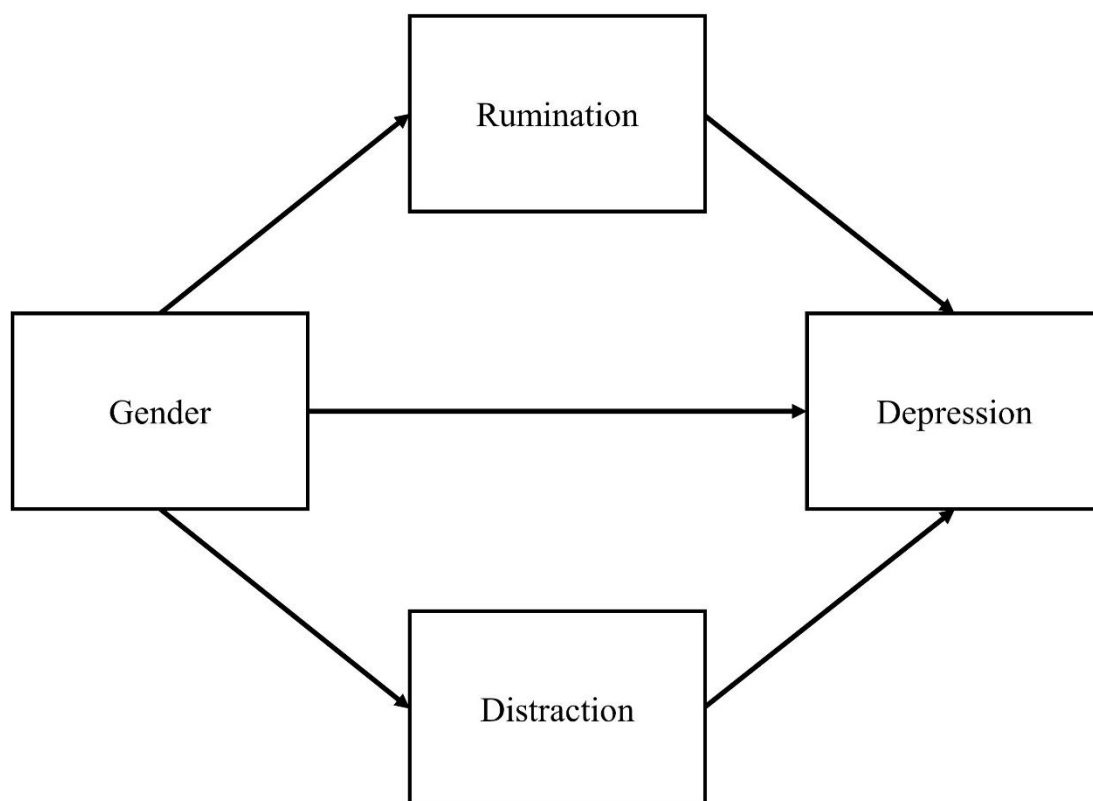
Therefore, according to RST, gender differences in ER can explain, at least partially, gender differences in rates of depression, which is depicted in Figure 2.1. In addition to response styles, it is also proposed that females experience more chronic strain and have a lower sense of mastery in their lives, and these factors also contribute to higher rates of depression amongst females (Nolen-Hoeksema et al., 1999).

Thus, the key tenets of RST are (1) there are gender differences in rumination and distraction, (2) rumination and distraction are associated with depression in different ways, and (3) gender differences in rumination and distraction can explain gender differences in depression. We know from Section 2.2.3.4 that there is evidence to support the first tenet of

RST. There is strong evidence that females are more likely to use rumination to regulate their emotions compared to males (D. P. Johnson & Whisman, 2013), and this is found consistently across the lifespan (Nolen-Hoeksema & Aldao, 2011; Trives et al., 2016; Zimmermann & Iwanski, 2014). Furthermore, there is some evidence that males are more likely to use distraction, but clearer findings emerge when specific emotions are measured (Trives et al., 2016). In terms of the link between rumination, distraction, and mental health, the evidence will be discussed below.

**Figure 2.1**

*The Key Tenets of Response Styles Theory*



**2.3.4.1. Rumination and Mental Health.** In correlational research, people who rely on rumination and worrying to regulate their emotions tend to have poorer mental health, and higher levels of clinical symptoms such as depression and anxiety (Dixon-Gordon et al., 2015b). Rumination is implicated in almost all clinical disorders (Ehring & Behar, 2020), and

high levels of rumination are associated with depression (both clinical depression and subclinical symptoms; Watkins, 2008), as well as many other disorders such as social anxiety, eating disorders, insomnia, bipolar disorder, and panic disorder (Ehring & Watkins, 2008). Rumination is also negatively associated with markers of mental health, such as wellbeing (Kraiss et al., 2020). Rumination (particularly rumination which focuses on the symptoms of depression) also predicts depression 4 weeks, 6 months and 3.5 years later, although this was not the case for those with a previous diagnosis of depression (Huffziger et al., 2009).

A study by Peled and Moretti (2010) examined the rumination of sadness and anger in an emotion-specific manner. It was found that using rumination to regulate sadness had a unique relationship with depression, and using rumination to regulate anger had a unique relationship with aggression (Peled & Moretti, 2010). This is particularly important for the present research because it demonstrates that using rumination to regulate specific emotions has a different impact on variables associated with mental health, such as aggression and depression. Thus, it is possible that this is also the case for other ER strategies.

In terms of gender differences, there is also evidence that rumination mediates the relationship between gender and depression, which is in line with RST. In a study by Thayer et al. (2003), gender differences in ER were found to account for gender differences in depression in a sample of undergraduate students. Specifically, females were more likely than males to pay attention to their emotions during regulation. When gender differences in ER were controlled for, the gender difference in depressive symptoms disappeared. This has also been found in adolescents aged 10-17, with rumination explaining the gender difference in depression (Jose & Brown, 2008).

Similarly, in a longitudinal study of adults aged 25 to 75 years old, the effects of experiencing chronic strain, a lower sense of mastery, and the use of rumination on

depression were assessed over a year (Nolen-Hoeksema et al., 1999). Females had higher rumination, chronic strain, and depression, and a lower sense of mastery compared to males. Further, rumination, mastery and chronic strain fully mediated the gender differences in depression. Chronic strain was indirectly related with depression, through rumination (Nolen-Hoeksema et al., 1999). These findings thus provide support for RST and implicate gender differences in rumination as a contributory factor in the observed gender differences in depression.

**2.3.4.2. Distraction and Mental Health.** Compared to rumination, there are fewer studies considering the relationship between distraction and variables associated with mental health. In correlational research, greater use of distraction is associated with less chance of receiving a diagnosis of depression (Polanco-Roman et al., 2015), less frequent NSSI, and fewer instances of self-harm with suicidal intent (Polanco-Roman et al., 2015). Amongst individuals receiving CBT for clinical depression, individuals who used distraction to regulate their negative emotions were judged by their practitioner as being more engaged in their treatment, and greater distraction predicted more positive feedback from the individuals about the therapy, which is a marker of success of the therapeutic process (Teismann et al., 2012). Distraction has been found to effectively reduce the urge to engage in NSSI after a negative mood induction, amongst individuals who engage in self-harm behaviours (In et al., 2021). Further, intuitively using distraction and positive activities as a way of regulating emotions was associated with less intense suicidal thoughts amongst individuals with a diagnosis of a mood disorder or borderline personality disorder (Stanley et al., 2021).

In longitudinal research, amongst adults with a previous diagnosis of depression, higher distraction at baseline predicted lower levels of subsequent depression 4 weeks, 6 months and 3.5 years later (Huffziger et al., 2009). This is in contrast with the finding that rumination did not predict subsequent depression amongst those with a diagnosis of

depression, but did for those with sub-clinical symptoms (Huffziger et al., 2009). This may indicate that distraction is more strongly related to more severe clinical diagnosis of depression, and so may be a protective factor in clinical depression.

Furthermore, a study by Wolgast and Lundh (2017) highlighted a distinction between different types of distraction and the implications of this for mental health. It is possible to use distraction in two ways – (1) distracting while maintaining an attitude of acceptance towards negative emotions, or (2) distracting in order to avoid the experience of the emotion. Individuals who used distraction paired with acceptance had higher positive emotion, lower negative emotion, and greater wellbeing compared to those who used distraction to avoid negative emotion (Wolgast & Lundh, 2017). Further, people with a diagnosis of depression were less likely to use distraction with acceptance and more likely to use distraction with avoidance, compared to a non-clinical sample (Wolgast & Lundh, 2017). Therefore, there is evidence that distraction is generally adaptive for mental health, with greater use of distraction being associated with lower symptoms, although this depends on whether the distraction involves acceptance or avoidance of the emotion.

**2.3.4.3. Summary of Response Styles Theory.** To summarise, according to RST, females are more likely to ruminate, and males are more likely to distract in response to a depressed mood, and this results in higher and lower levels of depression respectively. Evidence from the ER literature shows that females do indeed ruminate more (D. P. Johnson & Whisman, 2013), but the evidence regarding distraction is mixed. However, when specific emotions are focused upon, males tend to use distraction more to regulate sadness (Trives et al., 2016), whereas females prefer distraction to rumination when they feel angry, which is not the case for males (Rusting & Nolen-Hoeksema, 1998).

In terms of the impact of rumination and distraction on mental health, rumination tends to have a negative impact on mental health, with greater rumination being associated



with a range of different clinical disorders (Ehring & Watkins, 2008), and predicting depression longitudinally in a community sample (Huffziger et al., 2009). Greater use of distraction tends to predict lower depression over time amongst people with a clinical diagnosis of depression (Huffziger et al., 2009). One study found that rumination (along with mastery and chronic strain) fully explained gender differences in depression (Nolen-Hoeksema et al., 1999). Therefore, there is strong evidence to support the key tenets of RST, and this framework may help to explain the relationship between gender, ER and variables associated with mental health.

#### **2.4. Theoretical Basis for Empirical Studies**

Now that the key theories in the emotion and ER literatures have been discussed in Chapter 1, and the relationships between gender, ER, and mental health have been described in the present chapter, in this section the theoretical background for the empirical studies in the present research will be explained. Study 1 involved categorising raw data into ER strategies, and so it was important to choose theories that were clear on how ER strategies are defined and classified. Two theories were used as a basis for Study 1 – the process model of ER, and the Parkinson and Totterdell (1999) taxonomy of affect regulation. These theories were chosen because they each provide a clear framework for categorising ER strategies.

Study 1 involved text responses being coded into individual ER strategies, and wider categories of engagement, disengagement and distraction, in order to examine the relationship between gender and emotion-specific ER. The process model was firstly chosen as a framework for categorising individual ER strategies because it provides guidance on how to distinguish between different ER strategies on a temporal basis. The process model distinguishes between different strategies according to the point at which they intervene in the unfolding of an emotion. This framework was used to categorise the raw data into some

of the key strategies in the field, such as avoidance, reappraisal, suppression, and rumination. In addition to this, other strategies which the process model defines less clearly, such as acceptance, were also used.

The next step was categorising these ER strategies into wider categories of ER. The Parkinson and Totterdell (1999) taxonomy was chosen for these wider categories because it provides clear guidance for how these strategies should be categorised. The Parkinson and Totterdell (1999) framework is empirically-derived, and using this framework ensured that the categorisation process was consistent. It is important to note that the main theories of ER complement, rather than contradict, one another. This means that ER strategies that were categorised according to the process model, were also consistent with the Parkinson and Totterdell (1999) framework.

Study 2 was split into two parts. In Study 2a, gender differences in emotion-specific ER were investigated using an emotion-regulation task. Specifically, how effectively individuals used two ER strategies (cognitive reappraisal and cognitive distraction) was examined. The process model was used as the theoretical basis for Study 2a. The process model was chosen because it provides an explanation for why some ER strategies are more effective than others. Study 2a builds on the findings of the process model by comparing the effectiveness of ER strategies in regulating specific emotions. In other words, Study 2a was testing the process model by examining ER effectiveness in an emotion-specific manner.

In Study 2b, the relationships between gender, emotion-specific ER, and mental health were explored. The key theory in the literature which has focused on these relationships is Response Styles Theory (RST). According to RST, the way that individuals respond to their emotions (i.e., their ER strategies) can have an impact on mental health, and can partly explain gender differences in mental health. Therefore, RST was chosen as a way of understanding the relationships between gender, emotion-specific ER, and mental health.

The present research builds on the findings of RST by examining these relationships in an emotion-specific manner.

## **2.5. Conclusion and Next Steps**

In this chapter, it was established that (1) there are gender differences in ER, (2) ER may contribute to mental health, and (3) there are gender differences in variables associated with mental health, including depression, self-harm, and suicidal ideation. Based on this, it is logical that gender differences in ER may contribute to the gender differences observed in variables associated with mental health. This has been examined within the context of RST, which examines the role of ER in depression, but these principles may apply to other variables that are associated with mental health. No studies to date have examined this relationship in an emotion-specific manner. It is important to do so, because the relationships between gender, ER, and variables associated with mental health may depend on the emotion being regulated. Examining these questions in an emotion-specific manner may provide essential information to guide therapeutic practice by ensuring treatment is tailored to the individual's needs.

Now that the importance of investigating gender differences in ER in an emotion-specific manner has been discussed, the next question to address is how ER is measured. As with many psychological constructs, measuring emotion can be challenging, and measuring specific emotions poses unique challenges. Different methodological approaches to measuring ER can offer different information about how an individual regulates their emotions, such as how often they use a particular strategy, and how effectively they can implement it. As discussed in Chapter 1, specific emotions differ in their subjective experience (Cowen et al., 2020; Cowen & Keltner, 2017; Lench et al., 2011). Therefore, it is crucial to include a measure of subjective experience in any research examining the

regulation of specific emotions. In Chapter 3, the methodological approaches to measuring ER will be discussed.

#### KEY POINTS FOR CHAPTER 2

1. There are gender differences in variables associated with mental health. There is also evidence that the use of ER strategies may be associated with some mental health problems.
2. Research has found that gender differences in ER can account for the gender differences observed in rates of depression. ER may explain some of the gender differences found in mental health more widely.
3. However, no studies to date have examined this in an emotion-specific manner. It is important to do so, because the relationships between gender, ER, and mental health may depend on the specific emotion being regulated.

#### QUESTIONS FOR SUBSEQUENT CHAPTERS

1. How are specific emotions measured in ER research?
2. How is the subjective experience of emotion measured in research?
3. What do different ER measures tell us about how individuals regulate their emotions?

#### NEXT STEPS

Now that the ER literature has been reviewed, the next issue to address is how research which measures ER in an emotion-specific manner is conducted. In Chapter 3, the different methodological approaches to measuring ER will be discussed. In particular, this discussion will focus on (1) what different ER constructs tell us about how individuals manage their emotions, (2) the unique challenges around measuring specific emotions, and (3) how subjective experience is measured in emotion research.

## **Chapter 3: Methodological Approaches to Emotion Regulation and the Methods used in the Present Research**

### **3.1 Chapter Summary**

In the previous chapters, it was highlighted that there are gender differences in ER, and ER may explain some of the observed gender differences in mental health. However, no study to date has examined the relationships between gender, ER, and variables associated with mental health in an emotion-specific manner, by measuring specific emotions such as sadness, anger, and fear individually. This is problematic because it is possible that gender differences in ER, and the relationship between ER and variables associated with mental health, may depend on the emotion being regulated.

A challenge in conducting this emotion-specific research is that there are presently few methods available that allow for ER to be measured in an emotion-specific manner. Consequently, methodological approaches must be carefully chosen which allow specific emotions to be measured individually. In Chapter 1, the importance of subjective experience was also discussed. Research evidence indicates that subjective experience is the emotional component that demonstrates the largest difference between specific emotions. Therefore, using a measure of subjective experience is important in emotion-specific ER research.

In this chapter, the different methodological approaches to ER research will be reviewed. These approaches include measuring the frequency and effectiveness of ER using a variety of methods such as self-report questionnaires, and the emotion regulation task (ERT). Next, the importance of measuring subjective experience in emotion-specific research will be discussed. The research questions which drive the present research, and how these will be addressed using the two methodological approaches chosen for the present research, will also be discussed.

### **3.2. The Importance of Measuring Emotion Regulation in an Emotion-Specific Manner**

As discussed in Chapter 2, the majority of ER research relates to how people regulate general emotion, such as measuring the strategies individuals use to regulate negative and positive emotion as a general trait (Gross & John, 2003), or assessing how well an individual can use a particular strategy during an ER task in response to emotionally evocative stimuli, without measuring specific emotions (Gross, 1998a). In comparison, relatively fewer studies have assessed the regulation of specific emotions, such as sadness, anger and fear.

This is problematic for three reasons. Firstly, ER develops in an emotion-specific manner across adolescence (Zimmermann & Iwanski, 2014), and specific emotions tend to be regulated using different strategies (Dixon-Gordon et al., 2015a; Rivers et al., 2007; Vishkin et al., 2020; Zimmermann & Iwanski, 2014). Thus, it cannot be assumed that the way one emotion, or negative emotion in general, is regulated can be extrapolated to other specific emotions. Secondly, there is evidence that males and females may regulate their specific emotions differently (Sanchis-Sanchis et al., 2020), and so gender differences in ER may depend on the emotion being regulated. Thirdly, the regulation of specific emotions may have different consequences, such as on mental health (Boland et al., 2019; Clear et al., 2019). Therefore, in order to fully understand ER, we must distinguish between specific emotions (P. M. Cole, 2014). This presents a valuable opportunity to investigate the emotion-specific nuances which may exist in the relationship between gender, ER, and variables associated with mental health.

However, measuring the regulation of specific emotions presents unique challenges. There are limited emotion-specific self-report instruments available. Few self-report questionnaires measure the regulation of specific emotions, and those that do so are limited in several ways. Furthermore, eliciting specific emotions in an experimental setting can be

challenging, and few studies in the field have done so. However, actions can be taken to address these challenges, which will be discussed in the following sections.

### **3.3. Key Methods for Measuring Emotion Regulation**

The two most common methods for measuring ER are (1) measuring how often a person uses a particular ER strategy (ER frequency), and (2) measuring how skilled an individual is at using a particular ER strategy (ER effectiveness). As with all measures, there are strengths and limitations of each approach, and these will be discussed in the following sections.

#### ***3.3.1. Emotion Regulation Frequency***

ER frequency is how often an individual uses an ER strategy to regulate their emotions. ER frequency is measured through self-report questionnaires, which typically ask participants closed-ended questions regarding the extent to which they use certain ER strategies, often using a Likert scale. Self-report questionnaires of this nature are one of the most common methods of measuring ER. Some of the most widely used questionnaires are described in Table 3.1.

Self-report questionnaires are a useful method for measuring individual differences in the use of ER strategies, and using this method has produced informative findings about the implications of habitual ER on a range of variables, such as relationships and wellbeing (Gross & John, 2003). The use of self-report questionnaires has also highlighted some important emotion-general gender differences in ER, such as that females are more likely to ruminate (Nolen-Hoeksema et al., 1999), and males are more likely to suppress their emotions (Gross & John, 2003).

**Table 3.1.***Popular Self-Report Questionnaires Used to Measure ER*

<b>ER Measure</b>	<b>ER strategies</b>	<b>Context</b>	<b>Samples</b>	<b>Emotion-specific?</b>	<b>Gender differences</b>
Behavioural Emotion Regulation Questionnaire (BERQ; Kraaij & Garnefski, 2019)	Seeking distraction, Withdrawal, Actively approaching, Seeking social support, Ignoring the situation	Behavioural ER during stressful life events	Adolescents, Adults	No	Not examined
Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2002a)	Self-blame, Acceptance, Rumination, Positive refocusing, Refocus on planning, Positive reappraisal, Putting into perspective, Catastrophising, Other-blame	Cognitive ER during stressful life events	Adolescents, Adults	No	Females use rumination, catastrophising, and positive refocusing more than males (Garnefski et al., 2004).
Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)	Emotion dysregulation: non-acceptance of emotional responses, difficulties with goal-directed behaviour, difficulties with impulse control, lack of emotional awareness, limited access to ER strategies, lack of emotional clarity	Difficulties with ER	Children, Adolescents, Adults	No	Adolescents: females have greater difficulty regulating negative emotions, less access to effective ER, greater non-acceptance of emotions and less emotional clarity (Bender et al., 2012).  Adults: males have lower emotional awareness (Gratz & Roemer, 2004)
Emotion Regulation Inventory (ERI; König, 2011)	Controlled expression, Uncontrolled expression, Empathic suppression, Distraction, Reappraisal	Habitual ER in daily life	Adults	No	Not examined
Emotion Regulation of Others and Self Scale (EROS; Niven et al., 2011)	Extrinsic affect-improving, Extrinsic affect-worsening, Intrinsic affect-improving, Intrinsic affect-worsening	ER of the self (intrinsic) and others (extrinsic)	Adolescents, Adults, Clinical patients	No	Females use extrinsic affective-improving strategies more, and are less likely to use extrinsic affect-worsening strategies than males (Niven et al., 2011).
Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)	Cognitive reappraisal, Expressive suppression	Gross's (1998) Process Model of ER	Adults (but adaptations are available for other samples)	No	Mixed findings: No gender difference (Malesza, 2019). Males use suppression more than females (Gross & John, 2003).



**Table 3.1***Popular Self-Report Questionnaires Used to Measure ER (Continued)*

<b>ER Measure</b>	<b>ER strategies</b>	<b>Context</b>	<b>Samples</b>	<b>Emotion-specific?</b>	<b>Gender differences</b>
FEEL-KJ (Cracco et al., 2015)	Problem Solving, Distraction, Forgetting, Acceptance, Humour Enhancement, Cognitive Problem Solving, Revaluation, Giving Up, Withdrawal, Rumination, Self-Devaluation, Aggressive Actions	ER in children and adolescents	Children, Adolescents	Yes	The use of humour enhancement and cognitive problem solving decreases, and the use of rumination and self-devaluation increases for females across adolescence, but not for males (Cracco et al., 2017).
Negative Emotion Regulation Inventory (NERI; Zimmermann et al., 2008)	Adaptive ER, Social support, Passivity, Avoidance, Expressive suppression, Dysfunctional rumination, Dysregulation	Specific emotional contexts, development of ER	Adolescents, Adults	Yes	Females use social support seeking, and dysfunctional rumination more. Males use passivity, avoidance, and suppression more (Zimmermann & Iwanski, 2014).
Regulation of Emotions Questionnaire (REQ; Phillips & Power, 2007)	Internal-dysfunctional ER, Internal-functional ER, External-dysfunctional ER, External-functional ER	Functional and dysfunctional ER	Adolescents	No	Adolescent females are more likely to use external-functional ER (Kullik & Petermann, 2013).
Ruminative Response Scale (RRS; Treynor et al., 2003)	Rumination	Rumination as a response style to depression, Response Styles Theory	Adolescents, Adults, Clinical patients	No	Females are more likely to ruminate than males (Nolen-Hoeksema et al., 1999).

However, a limitation of this approach is that many self-report questionnaires do not measure ER in an emotion-specific manner. That is to say, these questionnaires tend to ask individuals to report how they regulate negative emotions in general, or how they regulate their emotions in a certain context such as a stressful life event. For example, the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), which is perhaps the most popular measure of habitual reappraisal and suppression in the field, asks individuals to report how they attempt to increase positive emotion, or decrease negative emotion, and this is used to calculate separate reappraisal and suppression scores. Thus, the ERQ measures the extent to which an individual uses reappraisal and suppression to regulate emotion generally. In other words, ER is measured as a general trait, rather than a skill which depends on the emotional context.

Emotion-general ER has been linked with a number of important life outcomes (Gross & John, 2003), and so these measures have an important place in the field of ER. However, it is also possible that nuances in the way that individuals regulate specific emotions and the relationship this has with correlates of ER (such as mental health) may be missed when ER is only examined in an emotion-general manner.

To date, there are only two available self-report questionnaires that measure the regulation of specific emotions, the FEEL-KJ (Cracco et al., 2015) and the Negative Emotion Regulation Inventory (NERI) (Zimmermann et al., 2008). The FEEL-KJ measures the use of adaptive and maladaptive ER to regulate anxiety, sadness and anger in children and adolescents. However, no version has yet been validated for use with other samples, such as adults (Cracco et al., 2015). Although the FEEL-KJ measures a wide range of strategies, it does not include some of the most common strategies published in the literature, such as reappraisal and suppression, which are associated with important variables.

Similarly, the NERI asks individuals to report how they respond to situations where they experience joy, sadness, anger or fear (Zimmermann et al., 2008). The NERI is the most comprehensive self-report measure of emotion-specific ER to emerge in the literature, and so represents a step forward for the field of ER. However, as with the FEEL-KJ, the NERI also does not include some of the most well-researched strategies, such as reappraisal, and so is limited as a tool to further explore reappraisal in different emotional contexts.

This limitation reflects a constraint of ER questionnaires generally, which is that only a small number of strategies can be measured in any one session. When also attempting to measure ER in different emotional contexts, this adds an additional layer which can begin to make questionnaires long and cumbersome for participants to complete. Generally, shorter questionnaires have higher response rates (Rolstad et al., 2011). Therefore, there is a gap in the ER literature for a methodological approach which captures the variety of different ways that individuals regulate their specific emotions, and is also short enough to reduce response burden, particularly for younger participants. In Section 3.5.2.1, an approach to measuring emotion-specific ER is presented to address this limitation, which was implemented in the present research. Overall, ER questionnaires are useful tools to use in ER research but have limitations in what they can be used for, particularly if the aim is to measure the regulation of specific emotions.

### ***3.3.2. Emotion Regulation Effectiveness***

The second key method for measuring ER is by assessing how skilled an individual is at reducing negative emotion in an experimental setting, after being instructed to use a particular ER strategy, such as reappraisal or suppression. This construct is often referred to as ER effectiveness (Theurel & Gentaz, 2018), ER ability (McRae et al., 2012b), or ER success (McRae, 2013).

It is important to assess how skilled an individual is at reducing their negative emotions using an ER strategy, rather than only measuring how frequently the strategy is used, because there is evidence that skill rather than frequency is more important for life outcomes. In a study of reappraisal amongst community adults by Ford et al. (2017), those who used reappraisal more frequently and more successfully experienced fewer depressive symptoms, but those who used reappraisal more frequently but less successfully experienced more depressive symptoms. This demonstrates that the effectiveness of implementing the ER strategy may be important for how adaptive an ER strategy is.

The most common method of measuring ER effectiveness is a widely used experimental paradigm known as the emotion regulation task (ERT) (Goldin et al., 2008; Gross, 1998a; McRae et al., 2012b). The ERT involves individuals being presented with stimuli which are designed to evoke an emotional response, such as music (Vieillard et al., 2020), pictures (Douw et al., 2020), or film clips (Boland et al., 2019). Participants are instructed to use a particular ER strategy, which is expected to reduce the level of negative emotion induced by the stimuli. Emotion levels are recorded during the task, usually at the end of each trial, or continuously. Emotion can be measured in a number of ways during the task, including self-reported emotions (i.e., subjective experience), physiological responding such as heart rate, and emotional behaviour such as facial expression (including facial electromyography).

In the ERT, participants also view emotional stimuli without any ER instruction on some trials. Levels of emotion during this ‘no regulation’ condition are compared to emotion levels during the ‘regulation’ condition, and the reduction in emotion levels is a measure of how effectively the participant used the ER strategy to regulate their emotions (i.e., ER effectiveness). Thus, ER effectiveness refers to an individual’s ability to reduce negative

emotion in response to emotional stimuli, after being instructed to use a particular ER strategy.

There are two aspects to using this paradigm to measure ER – (1) emotion must be induced during the experiment, and (2) the emotional response must be measured in some way, to assess the effectiveness of the ER strategy. Consequently, in order to use the ERT to measure ER in an emotion-specific manner, there must be an attempt to (1) elicit specific emotions using carefully chosen stimuli, and (2) measure specific emotions individually.

Although the ERT presents a unique opportunity to measure ER in an emotion-specific manner, very few studies have done so. Previous studies which have used the ERT tend to (1) use stimuli which induce a specific emotion (e.g., disgust), but measure negative emotion in general (Goldin et al., 2008; Gross, 1998a), (2) use stimuli to induce a specific negative emotion, and measure only one specific negative emotion (rather than measuring multiple specific emotions) (Gross & Levenson, 1997; Sheppes & Meiran, 2007; Sullivan & Kahn, 2020), or (3) use stimuli which induce general negative emotion without attempting to induce a specific target emotion, and measure general states such as negative emotion, stress, tension, physiological responding or neural activity (Albanese et al., 2019; Douw et al., 2020; Fitzgerald et al., 2019; Jackson et al., 2000; Lazarus & Alfert, 1964; Notarius & Levenson, 1979; Ochsner et al., 2002; Richards & Gross, 2000; Sheppes et al., 2014). Therefore, the optimal situation for measuring emotion-specific ER is to both elicit and measure specific emotions individually, to assess how ER may differ between emotions. The few studies which have measured multiple specific emotions during the ERT, such as Boland et al. (2019), tend to find emotion-specific differences in ER.

A potential reason for the lack of research examining ER in an emotion-specific manner is the challenge involved in eliciting specific emotions during an experimental task. It cannot be guaranteed that an emotional stimulus will create the desired effect (i.e., the

specific target emotion) within the participant. It is possible that the same emotional stimulus may induce varied emotions across individuals (R. W. Levenson, 2014). People may have different appraisals of the same situation depicted in an emotional stimulus, and these appraisals will lead to different emotional responses (Roseman, 1991). Similarly, an emotional stimulus may prompt mixed emotions within the individual during the ERT (Roseman & Evdokas, 2004).

However, some actions can be taken to address these challenges. Firstly, although it is possible for individuals to have different appraisals about the same situation, it is likely that certain emotional contexts, or antecedent events, will be associated with certain specific emotions (Ekman, 1992). Generally, fear is caused by a perceived threat in the environment, sadness is created by a perceived loss of a goal, and anger comes from the observation that our goals have been prevented by someone or something external to us (Ekman, 1992; Zenses et al., 2020). This means that certain emotional stimuli (such as images of snakes) are likely to elicit a predictable emotional response (such as fear) in the majority of participants during an experiment, although this is not guaranteed for all participants. If emotional stimuli are chosen which represents these themes (e.g., a threatening picture for fear), then this is likely to give rise to a similar emotional reaction across individuals, and may reduce individual differences in the range of emotional responses.

In commonly used databases of emotional stimuli, such as the IAPS (Lang et al., 1993), normative data regarding the emotional responses to different stimuli are provided (Mikels et al., 2005), which helps to guide researchers in selecting stimuli that target specific emotions. Different types of stimuli can be used in the ERT, but pictures are the most effective elicitors of specific emotions (Lench et al., 2011).

The second way to address the challenge of inducing specific emotions in an experimental setting is by recording multiple specific emotions during the ERT. This means

that in any trial of the ERT, all specific emotions of interest are measured, not just the target emotion for that trial. In other words, it should not be assumed that because the target emotion was sadness, that an individual would necessarily experience sadness, and only sadness. Measuring all emotions in each trial allows for a manipulation check of the ERT to be conducted, to ensure that the target emotion has been induced as intended, and to assess the extent of mixed emotions occurring in response to stimuli during the task. This means that the level of success in inducing specific emotions during the ERT can be assessed.

### **3.4. The Importance of Measuring Subjective Experience in Emotion Research**

As discussed in Chapter 1, different theoretical perspectives offer diverse viewpoints as to whether emotions can be regarded as specific. There is evidence that emotions are organised as discrete categories, albeit with fuzzy boundaries between these categories (Cowen et al., 2018; Cowen et al., 2020; Cowen & Keltner, 2017). A prominent finding that has emerged from the emotion literature is that specific emotions tend to differ from one another in how they feel, which is the subjective experience of an emotion (Baumgartner et al., 2006a; Baumgartner et al., 2006b; Cowen et al., 2020; Cowen & Keltner, 2017; Dimberg, 1988; Harmon-Jones & Sigelman, 2001; Joseph et al., 2020; Lench et al., 2011).

Each of the three components that make up an emotional response, as outlined in Section 1.2.1, can be measured during the ERT. The difference in emotion between the ‘no regulation’ trials and the ‘regulation’ trials indicates the extent to which an emotional response has changed. However, in terms of measuring specific emotions, the evidence shows that some methods may be more suited to emotion-specificity than others. In the following sections, the measurement of physiological arousal, emotional behaviour and subjective experience will be discussed.

### ***3.4.1. Measuring Physiological Arousal***

The autonomic nervous system (ANS) is active during an emotional response (Christopoulos et al., 2019; Kreibig, 2010), and this physiological arousal can be measured during an ERT using a range of tools, such as electrodermal and cardiovascular recording (Mauss & Robinson, 2009). However, the ANS is not exclusively involved in an emotional response, and is in fact implicated in a number of bodily processes, including digestion, attention and homeostasis (Cacioppo et al., 2000; Robertson, 2019). This means that activation of the ANS during the ERT may be due to reasons unrelated to an emotional response.

Furthermore, the evidence around emotion-specificity in physiological responding tends to be mixed (Cacioppo et al., 2000; Kuppens, 2019; Lench et al., 2011; Mauss & Robinson, 2009). Although there is evidence of emotion-specific patterns in ANS activity (Kreibig, 2010), these predominantly tend to show differences between positive and negative emotions (Lench et al., 2011), and there is less evidence for physiological differences between specific negative emotions, particularly sadness, anger and fear (Cacioppo et al., 2000; Ekman et al., 1983).

Furthermore, often multiple physiological measures must be used in a single study in order to observe emotion-specific differences (Collet et al., 1997), which can substantially increase the duration of the experimental session, placing additional burden on participants. Therefore, recording physiological responses may be more suited for distinguishing between positive and negative emotions, and may not be the optimal method for measuring changes in sadness, anger, and fear in the ERT.

### ***3.4.2. Measuring Emotional Behaviour***

In terms of emotional behaviour, there is evidence of emotion-specificity in facial expression research (Ekman & Friesen, 1971; Ekman et al., 1987; Ekman et al., 1969; Izard,



1971). However, measures of emotional behaviour are less reliable in differentiating between specific negative emotions during an experimental task, and facial expression does not always directly map on to subjective experience (Lench et al., 2011). Additionally, there are individual differences in the use of expressive suppression (Gross, 1998a; Gross & John, 2003; Peters et al., 2019; Sullivan & Kahn, 2020), and many people use this strategy without conscious awareness (E. A. Butler et al., 2003). Therefore, if a participant naturally suppresses their expression of emotion, this will interfere with using facial behaviour as a measure of emotion.

Similarly, facial behaviour can also be measured using facial electromyography (fEMG), which records muscular activity in the facial muscles associated with emotional expression (Fridlund et al., 1984). Although studies have found that fEMG can reliably differentiate between a positive and a negative emotion (Brown & Schwartz, 1980; Dimberg, 1988; Dimberg & Thunberg, 1998; Magnée et al., 2007), there is little evidence that fEMG can distinguish between specific negative emotions (Brown & Schwartz, 1980). Recent studies have been more successful in identifying emotion-specific patterns using fEMG (Wingenbach et al., 2020), however these results are tentative. Therefore, fEMG may not presently be the most valid measure of specific negative emotions but may be increasingly implemented in emotion-specific research as technology advances.

### ***3.4.3. Measuring Subjective Experience***

Subjective experience refers to the internal ‘feelings’ of an emotion. Subjective experience is the defining element of an emotion (Kuppens, 2019), which is often regarded as the essence of an emotional response (LeDoux & Hofmann, 2018; Lieberman, 2019). An individual’s feelings are inextricably tied to their emotions (Keltner et al., 2019), and measuring these feelings can effectively track changes in an emotional response (Lench et al.,

2011). Subjective experience is the component that differentiates an emotion from other affective states such as stress, as well as other bodily states such as physical pain or digestion (Ekman, 1999).

Moreover, subjective experience is the emotional component which has the most marked emotion-specific findings in the literature. In a meta-analysis of over 600 studies, measuring subjective experience differentiated between specific negative emotions, including sadness, anger, and anxiety (Lench et al., 2011). Furthermore, subjective experience was a stronger measure for distinguishing between sadness, anger, and anxiety than physiological or behavioural methods (Lench et al., 2011). Self-reported differences in subjective experience between specific emotions have been reported extensively throughout the literature (Baumgartner et al., 2006a; Baumgartner et al., 2006b; Cowen et al., 2020; Cowen & Keltner, 2017; Dimberg, 1988; Harmon-Jones & Sigelman, 2001; Joseph et al., 2020), and so there is strong evidence that specific emotions such as sadness, anger and fear are experienced differently.

In addition, many studies which have demonstrated associations between ER and variables associated with mental health have used subjective experience as the measure of ER (Aldao et al., 2010; McRae et al., 2012b). For example, ER as measured by self-reported subjective experience has been associated with bipolar disorder (Kjærstad et al., 2016), major depressive disorder (Ellis et al., 2013), and self-harm behaviour (T. S. Davis et al., 2014). Further, when measuring the regulation of specific emotions through self-reported subjective experience, the relationship between ER and clinical disorders such as depression depends on the specific emotion being regulated (Boland et al., 2019).

Subjective experience is measured through self-reporting, usually by using a Likert scale on which an individual records how intensely they are experiencing an emotion (Gross, 1998a). Self-report is widely used in psychological research generally, as it enables the

measurement of internal experiences which cannot be accessed using any other technique (Keltner et al., 2019; LeDoux & Hofmann, 2018; Stone et al., 2000). Self-report also allows for the regulation of specific emotions to be measured using separate scales, which means that an individual's experience of specific emotions can be measured. This makes self-report an extremely valuable measure in emotion-specific research. Similarly, measuring specific emotions on individual self-report scales means that the extent to which the target emotion has been successfully elicited in the ERT can be assessed.

#### ***3.4.4. Summary of Measuring Emotional Components***

During the ERT, measuring any one of these components of an emotional response can provide useful information about ER. Interesting findings have been found in previous studies, with ER strategies being shown to impact all three emotional components during an experimental task (Boland et al., 2019; Goldin et al., 2008; Gross, 1998a). However, when attempting to conduct ER research in an emotion-specific manner, not all measures are equal. The evidence indicates that subjective experience is the most valid measure of specific emotions (Lench et al., 2011), and emotion-specific differences in physiological arousal and behaviour are less consistent in the field (Keltner et al., 2019; Mauss & Robinson, 2009). Some methods may be more sensitive in detecting the nuances between specific emotions that make them more suitable measures for emotion-specific research. Therefore, although all three methodological approaches can provide useful data about ER, subjective experience is the component which has shown the most marked emotion-specific differences (Lench et al., 2011).

### **3.5. Research Questions and Methods of the Present Research**

#### ***3.5.1. Research Questions Used To Guide The Present Research***

Based on the review of the research literature in the previous chapters, the following research questions were formulated to guide the present research:

- RQ1. Is ER different for specific emotions?
- RQ2. Are there gender differences in the regulation of specific emotions, and do these gender differences vary across different emotions?
- RQ3. Are there gender differences in engagement and disengagement ER?
- RQ4. Does the effectiveness of reappraisal and distraction depend on the specific emotion being regulated?
- RQ5. Are gender differences in emotion-specific ER related to gender differences in mental health?

Two empirical studies were conducted to address these questions. The research questions which are addressed by each study are shown in Table 3.2.

Relatively few studies have examined whether ER differs across specific emotions, and so RQ1 pertains to whether ER is different for the specific emotions of sadness, anger, and fear. Similarly, very few studies have examined gender differences in ER in an emotion-specific manner, which is important because males and females may receive different cultural messaging about specific emotions. RQ2 is related to whether there are emotion-specific gender differences in ER. A pattern can be observed in the ER literature, which is characterised by females using strategies which involve engagement, and males using strategies which involve disengagement, but this has never been explicitly tested before. RQ3 is relating to whether females are more likely to engage, and males are more likely to disengage with their emotions during ER.

According to Gross’s process model of ER, described in Section 1.3.2.1, distraction is a more effective ER strategy than reappraisal, but this does not take into account the role of specific emotions. RQ4 asks whether the effectiveness of reappraisal and distraction depend on the specific emotion being regulated (sadness, anger, or fear). Finally, there is empirical evidence that ER may be related to gender differences in mental health, but this has never been tested in an emotion-specific manner. RQ5 asks whether there is a relationship between gender, emotion-specific ER, and variables associated with mental health (depressive symptoms, self-harm behaviour, and suicidal ideation).

**Table 3.2**

*Overarching Research Questions and the Studies That Address Them*

<b>Research question</b>	<b>Study 1</b>	<b>Study 2a</b>	<b>Study 2b</b>
RQ1. Is ER different for specific emotions?	X		
RQ2. Are there gender differences in the regulation of specific emotions, and do these gender differences vary across different emotions?	X	X	
RQ3. Are there gender differences in engagement and disengagement ER?	X		
RQ4. Does the effectiveness of reappraisal and distraction depend on the specific emotion being regulated?		X	
RQ5. Are gender differences in emotion-specific ER related to gender differences in mental health?			X

### **3.5.2. Methods Used in the Present Research**

In the following sections, the methodological approaches which were chosen to address these research questions will be described.

**3.5.2.1. Study 1: Open-Ended Responses.** An open-ended questionnaire was chosen for Study 1, to measure emotion-specific ER amongst adolescents and adults. The open-ended questionnaire involved participants being asked to recall a situation during which they experienced a specific emotion – sadness, anger, or fear. Then they were asked to free-write about what they did, if anything, to try to reduce this feeling. People tend to use a small number of ER strategies (Jackson et al., 2000), and so this method is likely to tap into the key strategies that individuals use to regulate specific emotions.

This open-ended approach was chosen for three reasons, and aimed to address the limitations of previous ER measures described in Section 3.3.1. Firstly, there are few self-report questionnaires which measure ER in an emotion-specific manner. Also, these tend to be limited in the number of strategies that can be measured, and they often do not measure some of the most widely researched strategies in the literature, such as reappraisal. By using an open-ended questionnaire, the use of ER could be measured in different emotional contexts (i.e., sadness, anger, and fear) in order to capture the range of strategies that individuals use to regulate specific emotions. This approach is flexible and can be used to measure any number of specific emotions, but sadness, anger, and fear were chosen in the present study, for reasons discussed in Section 1.3.3.2.

Secondly, many of the existing self-report questionnaires have been validated for use with one age group, such as adolescents (Cracco et al., 2015), but cannot be used across age groups. Although the FEEL-KJ can be used with both adolescents and adults, this does not include important ER strategies such as reappraisal. The present study included both adolescent and adult participants in order to examine any interactions between gender and

age. As the open-ended questionnaire was designed for the present study, it could be written in such a way that it was accessible for both adolescents and adults (i.e., written in plain English without jargon), and so was appropriate to use for both age groups.

Thirdly, many of the previous self-report questionnaires are restricted to measuring only a small number of ER strategies. This may not be an accurate reflection of the range of strategies people use to regulate their emotions. The approach chosen for the present research is beneficial because it allows participants to freely report on their ER strategies, which means that strategies that may not be included in previous questionnaires can be captured, and participants have more freedom in reporting their ER.

Finally, as outlined in Section 2.2.3.6, a pattern can be observed in the ER literature which is characterised by males being more likely to regulate their emotions using avoidance (Zimmermann & Iwanski, 2014), and females being more likely to pay attention to emotions during regulation (D. P. Johnson & Whisman, 2013). It is possible that this pattern may differ according to the specific emotion being regulated, but this hypothesis has not been explicitly tested in the literature. Therefore, this open-ended approach can be used to test this hypothesis, by coding the participant responses into broad categories of engagement, disengagement, and distraction ER, using a framework derived from Parkinson and Totterdell's (1999) model of ER strategies, which was described in Section 1.3.2.4.

In summary, this approach allowed for three of the research questions shown in Table 3.2 to be addressed in Study 1 – RQ1, RQ2, and RQ3. RQ1 involved investigating if ER strategies differ across specific emotions, and this was tested in Study 1 by examining if the percentage of people reporting a strategy differed across emotions. This relied on the text data from the open-ended questionnaires being categorised into ER strategies for each emotion. RQ2 was related to whether there are emotion-specific gender differences in ER, and this involved examining the relationship between gender and ER strategies which were

coded from the open-ended questionnaires. RQ3 involved examining whether there are gender differences in engagement or disengagement ER, and this relied on the ER strategies being coded into broader ER categories (engagement, disengagement, and distraction ER) using the Parkinson and Totterdell framework, and then testing for a relationship between gender and these wider categories. Therefore, the open-ended questionnaire used in Study 1 allowed for participant responses to be coded into ER strategies, which enabled these research questions to be addressed.

### **3.5.2.2. Study 2: Regulating Sadness, Anger, and Fear in the Emotion**

**Regulation Task.** In Study 2, the ERT was used to measure the regulation of sadness, anger, and fear. As outlined in Section 1.3.3.2, these three emotions were chosen because they consistently emerge as key emotions in studies of discrete emotions, they have been researched in previous emotion-specific work, and they have important implications for variables associated with mental health.

From a methodological perspective, a further advantage of measuring sadness, anger, and fear during the ERT is that there are normative data available about the extent to which individuals experience these emotions after viewing the emotional pictures used in this study, which is detailed in this section. This means that images can be carefully chosen which aim to induce these target emotions during the task, which enables emotion-specific ER to be measured. In addition, sadness, anger, and anxiety (which is closely related to fear) have large differences in their subjective experience (Lench et al., 2011). This means that sadness, anger and fear are ideal candidates for emotion-specific research, because individuals are able to identify which specific emotion they are experiencing and self-report this emotional experience. This is the key method for determining the effectiveness of ER.

The biggest advantage of using the ERT is that it can be modified to allow for ER to be measured in an emotion-specific manner. In the task, general negative emotion is typically



measured by selecting stimuli which elicit a mix of emotions. However, emotional stimuli can be chosen which have been found to predominantly induce a target emotion, according to normative values measured in a sample of participants (Mikels et al., 2005). These carefully chosen pictures are presented in the ERT to attempt to induce specific negative emotions within the participant. This provides the opportunity for the participant to regulate this specific emotion (elicited by the image) and means that the regulation of specific emotions can be measured.

Many different types of emotional stimuli can be used to induce emotion in the ERT, such as emotional film clips, music, autobiographical recall, and situational procedures (Siedlecka & Denson, 2019). However, emotional pictures were chosen for the present research because they reliably induce emotions (Lang et al., 1993; Langer et al., 2020; Mikkelsen et al., 2020; Moodie et al., 2020; Siedlecka & Denson, 2019; Vishkin et al., 2020), and are the most effective stimuli for inducing specific negative emotions in a laboratory setting (Joseph et al., 2020; Lench et al., 2011).

The process for choosing the images to elicit specific emotions was as follows. Images were chosen from two databases which were specially developed for emotion research - the International Affective Picture System (Lang et al., 1997), and the Nencki Affective Picture System (Marchewka et al., 2014). These databases are comprised of static colour images that are frequently used in emotion research. These images depict a wide variety of situations that evoke negative and positive emotions, such as war, surgery, and fighting.

The images selected for the present study were carefully chosen to recreate situations that would commonly be associated with specific emotions. As discussed in Chapter 1, sadness often occurs due to a loss, anger results from interference with an important goal, and fear signals a threat (Ekman & Cordaro, 2011). The sad images thus depict situations of loss,

namely children, animals or elderly people who are injured or ill (where the cause of this injury or illness is not clear), and individuals who have been involved in accidents or are facing tragedy. The images which aim to induce anger contain content of injustices, specifically litter in a green area, Nazi symbolism, people being attacked, a child smoking, an animal which appears to have been abused, and a female who has severe burns. The fear images depict threatening images and are all images of animals in a threatening pose, such as snakes and wolves.

The images were chosen using normative data collected by Mikels et al. (2005) and Riegel et al. (2016). This data contains the self-reported levels of specific emotions reported by a sample of participants after viewing each of the images. The images which have the highest value for the target emotion, and lowest values for inducing other emotions, were selected for use in the ERT. In other words, these normative values were used to choose images which are likely to induce the target emotion. The following criteria were employed to select images for the ERT which induce sadness or fear. As there are fewer images available in these databases which have been found to induce only anger experimentally, a different set of criteria were used for anger, which is described below.

The criteria used to select images for the ERT were:

1. Images must induce one discrete emotion only (i.e., the target emotion)
2. Images in the no regulation and regulation trials must be matched on the level of emotion induced (to within .30 of the mean level of emotion for normative data)
3. Where data are available, images must be rated identically by males and females in terms of the emotional category of the image (i.e., there should be no gender differences in the level of emotion induced by the image).

However, a challenge in selecting images to induce anger during the ERT was that only two anger images met these criteria, and so supplementary images were required.

Consequently, anger pictures which induce mixed emotions, which are known as blended pictures, were permitted. Blended pictures with the highest anger means were chosen, as long as the anger mean was higher than the means for the other emotions. Thus, slightly altered criteria were applied to the anger stimuli, and the stimulus set was supplemented with 7 blended pictures from the IAPS which met these altered criteria.

Therefore, by carefully selecting pictures based on these normative values, the specific emotions of sadness, anger, and fear were aimed to be induced during the ERT. This allowed for participants' regulation of specific emotions to be assessed in the moment. Using the ERT in this emotion-specific manner contributes value to the literature by creating clarity in three key areas. In previous research, these issues have been examined by measuring general negative emotion, and as a consequence, mixed findings have emerged.

Study 2 was split into two parts – Study 2a, and Study 2b. In Study 2a, the ERT was used to address two of the research questions shown in Table 3.2 – RQ2, and RQ4. RQ2 related to whether there are gender differences in ER effectiveness for sadness, anger, and fear. This involved testing whether there were gender differences in the ER effectiveness scores derived from the ERT. RQ4 involved investigating whether the effectiveness of ER (as measured by a reduction in self-reported emotion levels during the ERT) differed according to the specific emotion being regulated. In Study 2b, RQ5 was addressed, which involved investigating whether gender differences in emotion-specific ER are related to gender differences in variables associated with mental health (depressive symptoms, self-harm behaviours, and suicidal ideation). The ER effectiveness scores from the ERT were used to test whether ER effectiveness mediated the relationship between gender and variables associated with mental health.

### **3.6. Conclusion and Next Steps**

In summary, the different methodological approaches to ER research were described in this chapter. The two key approaches in the ER field involve measuring (1) the frequency with which ER strategies are used using self-report questionnaires, and (2) the effectiveness of using ER strategies to reduce emotions during the ERT. Few studies have adopted these methods to examine ER in an emotion-specific manner. An open-ended questionnaire, and a modified version of the ERT, were used to address the research questions of the present research, as they allowed for ER to be measured in an emotion-specific manner. The ERT used the self-reporting of subjective experience to measure emotion, which has demonstrated the largest emotion-specific differences in the literature and is regarded as the core component of an emotional response.

Now that the methodological approaches and research questions have been described, the empirical studies of the present research will be reported in the following chapters. In Chapter 4, Study 1 will be reported, which aimed to investigate if there are gender differences in the regulation of sadness, anger, and fear in an adolescent and adult sample. In Chapter 5, the first part of Study 2 will be described (Study 2a), which investigated whether there are gender differences in the effectiveness of using ER during the ERT to regulate sadness, anger, and fear. In Chapter 6, the second part of Study 2 will be discussed (Study 2b), which examines whether gender differences in the regulation of specific emotions are related to gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation.

### KEY POINTS FOR CHAPTER 3

1. Many of the previous measures in the field do not allow for ER to be examined in an emotion-specific manner. The emotion-specific measures that are available often miss out important ER strategies, such as reappraisal.
2. The largest emotion-specific differences are found in the subjective experience of emotion, and so it is important to include subjective experience in emotion-specific ER research.
3. Two complementary measures were chosen for the present research – open-ended questionnaires and the ERT - which allow for ER to be measured in an emotion-specific manner.

### QUESTIONS FOR SUBSEQUENT CHAPTERS

1. Are there gender differences in the reporting of ER to regulate sadness, anger and fear? (Chapter 4)
2. Are there gender differences in the effectiveness of using ER to regulate sadness, anger and fear? (Chapter 5)
3. Are gender differences in ER related to gender differences in variables associated with mental health? (Chapter 6)

### NEXT STEPS

Now that the methodological approaches to measuring ER have been outlined, the empirical studies which test the aims of the present research will be discussed, in Chapter 4 (Study 1), Chapter 5 (Study 2a), and Chapter 6 (Study 2b).

## **Chapter 4: Gender Differences in the Reporting of Emotion Regulation Strategies to Regulate Sadness, Anger and Fear (Study 1)**

### **4.1. Chapter Summary**

In Chapter 2, it was established that although there is evidence for gender differences in ER more generally, there is a lack of research investigating gender differences in the regulation of specific emotions. The aims of Study 1 are therefore: (1) to examine whether the reporting of ER strategies differs across specific emotions, (2) to test if there are emotion-specific gender differences in the reporting of ER strategies to regulate sadness, anger, and fear, and (3) to test if there are gender differences in engagement, disengagement, and distraction ER. To achieve these aims, adolescents and adult participants wrote about the strategies they used to regulate sadness, anger, and fear, and these free text responses were coded into specific ER strategies (e.g., reappraisal), and also into wider categories of ER (i.e., engagement, disengagement, and distraction). Each of these wider categories of ER encompassed several specific ER strategies.

Cochran's Q tests showed that the reporting of almost all of the ER strategies varied across the emotions. Chi-square analyses also demonstrated that there were some gender differences in ER, but these differences depended on (1) the specific emotion, and (2) the ER strategy. A key finding was that gender differences in the use of reappraisal varied by emotion, which brings clarity to an area with mixed findings. These results highlight the importance of conducting ER research in an emotion-specific manner, and indicate that the method used in Study 1 is a valid technique for measuring ER strategies in different emotional contexts. These findings may also have implications for ER training as a treatment for poor mental health.

## **4.2. Introduction**

### ***4.2.1. Rationale for Study 1***

As discussed in Section 3.3, many ER researchers tend to rely on the use of closed-ended self-report questionnaires to gather information about the ways that individuals regulate their emotions (Garnefski et al., 2004; Gross & John, 2003; Kraaij & Garnefski, 2019). A problem with this approach is that an assumption is made in advance about the ER strategies individuals use, and this method is constrained to measuring a relatively small number of ER strategies to limit any response burden to the participants. As a result, it is unclear whether the ER strategies that are commonly researched truly reflect the strategies individuals tend to use in their daily lives. To address this, a methodological approach must be used which allows participants to freely report their ER strategies without the constraints of closed-ended questionnaires and rating scales. Such an approach is used in the present study.

Additionally, much of the research in the field has been restricted to examining the regulation of general negative emotion (Jackson et al., 2000; Lazarus & Alfert, 1964; Notarius & Levenson, 1979; Richards & Gross, 2000; Sheppes et al., 2014), and does not partition out the regulation of specific negative emotions such as sadness, anger, or fear. This is problematic, because the evidence indicates that ER develops in an emotion-specific manner (Zimmermann & Iwanski, 2014), and the regulation of specific emotions may have a different relationship with variables associated with mental health (Boland et al., 2019; Clear et al., 2019), and so it cannot be assumed that what is known about the regulation of one emotion can be applied to all emotions. A small number of studies have addressed this issue by examining ER in an emotion-specific manner (Dixon-Gordon et al., 2015a; Rivers et al., 2007; Zimmermann & Iwanski, 2014), and these studies tend to find that the ER strategies people use are indeed different for specific emotions.

However, there are some limitations of this previous work. Some studies have measured pre-determined ER strategies using self-report questionnaires (Dixon-Gordon et al., 2015a; Zimmermann & Iwanski, 2014). This approach is useful for measuring the most common strategies in the literature, but it is unclear if these strategies would be freely reported in these emotional contexts. In the study by Rivers et al. (2007), ER was measured using an open-ended approach similar to that used in the present study, which allows participants to freely report on their ER; however, this was measured within the context of relationships, rather than a more general context. Further, in the study by Rivers et al. (2007), the data were categorised into quite broad categories that grouped together some of the most commonly researched strategies such as reappraisal, which meant that emotion-specific differences for these strategies could not be examined. The approach used in the present study involves participants writing about their ER strategies when they feel sad, angry, or scared within a more general context, and this will allow all the relevant strategies highlighted as important by the participants to be captured. Therefore, the first aim of the current study is to record the ER strategies that individuals use to regulate sadness, anger, and fear, and to test if these strategies vary across specific emotions.

It has also been established in the previous chapters that there are gender differences in the use of some ER strategies, such as rumination (D. P. Johnson & Whisman, 2013), but mixed findings for others, such as reappraisal and distraction (Esmaeilinasaba et al., 2016; Garnefski et al., 2004; Nolen-Hoeksema & Aldao, 2011; Zlomke & Hahn, 2010). These mixed findings may be the result of previous research being focused on general negative emotion, without examining specific emotions individually. When gender differences in emotion-specific ER have been examined, such as in the studies by Rusting and Nolen-Hoeksema (1998), Cox et al. (2000), and Trives et al. (2016), clearer gender differences



emerged. Consequently, if ER strategies were investigated in an emotion-specific manner, it is possible that clearer gender differences may be found. Therefore, the second aim of the present study is to investigate whether there are gender differences in the reporting of ER strategies across specific emotions.

As highlighted in Section 2.2.3.6, a pattern can be observed in the ER literature. Generally speaking, females are more likely to report using some ER strategies that can be classed as engagement strategies, such as rumination (D. P. Johnson & Whisman, 2013). Males are more likely to report using strategies that can be classed as a type of disengagement, such as avoidance or suppression (Zimmermann & Iwanski, 2014). This evidence gives rise to the hypothesis that females may be more likely to engage, and males may be more likely to disengage with their emotions during regulation. However, this hypothesis has not been explicitly tested in the ER literature. As a result, the third aim of this study is to examine whether there are gender differences in engagement, disengagement, and distraction ER, which are broader categories of ER. In the present study, distraction is similar to disengagement, but involves removing attention from the emotional stimulus and replacing this with something unrelated.

This aim will be addressed using an empirically derived framework developed by Parkinson and Totterdell (1999), which was described in Section 1.3.2.4. The Parkinson and Totterdell framework is a taxonomy of ER strategies, which allows for ER strategies to be categorised as types of engagement, disengagement, or distraction, and the framework provides helpful guidelines for doing so. The framework is a valuable tool which is complementary to the method of the present study, as it provides a structure for classifying individual ER strategies into engagement and disengagement categories, as well as a distraction category. In the present study, gender differences in both individual ER strategies,

as well as these wider categories of engagement, disengagement, and distraction, will be tested.

#### ***4.2.2. Research Questions for Study 1***

Study 1 was guided by three specific research questions (SRQs):

- SRQ1. What are the key ER strategies that are reported for sadness, anger, and fear, and do these strategies vary by emotion?
- SRQ2. Are there gender differences in the reporting of specific ER strategies to regulate sadness, anger, and fear, and do these gender differences vary by emotion?
- SRQ3. Are there gender differences in broad engagement, disengagement, and distraction ER categories?

### **4.3. Method**

#### ***4.3.1. Participants***

Four hundred and sixty-eight participants took part in the study (199 males and 269 females). Adolescent participants aged 12-17 were recruited from secondary schools in North Lanarkshire, and young adult participants aged 18-30 were recruited online. The demographic characteristics of the sample are presented in Table 4.1.

The inclusion criteria were that participants must (1) be able to read and write in English, (2) be aged 12-30 (which includes both adolescent and young adult participants), and (3) identify as either male or female. It was important that participants were proficient in English to ensure that they were able to understand what was being asked of them in the study. The age range of 12-30 was chosen because an aim of the present study was to examine if gender differences varied across different age groups. In order to control the effect of age, specific adolescent and young adult age groups were chosen and individuals outside

of these groups were excluded. The rationale for these age groups is provided in Section 4.3.2 below.

Furthermore, a key aim of the present study was to examine gender differences in the reporting of ER strategies, and so males and females were chosen for these groups. A requirement of this research was to have well-defined gender categories, and so individuals not identifying as male or female were excluded. However, although males and females were focused upon in the present study, it is acknowledged that gender is broader than this binary, and an important direction for future research in this area is to examine ER processes amongst other gender-identification groups. Although data were originally collected from 476 participants, data from seven adult participants were removed due to the individuals being over 30 years old, and one participant's data was removed who did not identify as male or female.

The sample was mostly white (96.37%) and attending school or university (94.47%) at the time of data collection. In terms of the highest level of education attained by the adult sample (which is regarded as a proxy for socio-economic status; Maksimović et al., 2008), 2.41% had completed secondary school, 2.41% had completed technical training level education, 39.76% were current undergraduates, 26.51% had completed university, and 28.92% had completed post-graduate study. Socio-economic status in the adolescent group was measured using the Family Affluence Scale (Boyce et al., 2006). In this group, 3.88% were low, 66.67% were medium, and 29.46% were regarded as being in the high socio-economic group.

**Table 4.1**

*Mean (M) Age, Standard Deviation (SD) and Sample Size (n) for Each Gender and Age Group*

	Male			Female		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Young adolescents	131	12.98	0.73	137	12.89	0.77
Older adolescents	45	15.49	0.76	64	15.56	0.66
Adults	19	25.74	3.97	67	23.39	3.55
Total	195	14.80	4.00	268	16.15	4.71

### ***4.3.2. Age Groups***

The sample was split into three groups according to age. These groups were (1) young adolescents (12 to 14 years old), older adolescents (15 to 17 years old) and young adults (18 to 30 years old). Young adults were recruited in this study (as opposed to older adults or adults in general) as this group are relatively neglected in the ER literature (Rawana et al., 2014). Organising the sample in this way allowed for analyses to be conducted which examined gender differences in ER across different age groups, while maximising the cell counts for each group. This is important because ER tends to change across adolescence and into adulthood (Garnefski & Kraaij, 2006; Zimmermann & Iwanski, 2014), and there is often an interaction between gender and age in the use of ER strategies (Garnefski & Kraaij, 2006; Nolen-Hoeksema & Aldao, 2011).

The World Health Organisation (2021a) defines adolescence as ranging from 10 to 19 years old, but there is no standard classification system for organising adolescents into developmental subgroups based on their age, and different studies have used a variety of categories (Cox et al., 2000; Garnefski & Kraaij, 2006; Garnefski et al., 2002b; Larsen et al., 2013; Zimmermann & Iwanski, 2014). The groups used in the present study (younger adolescents aged 12-14, and older adolescents aged 15-17) were chosen based on empirical evidence demonstrating that generally speaking, there tend to be changes in emotional development across these age groups (B. Casey et al., 2017; Esnaola et al., 2017; Ross et al., 2019; Young et al., 2019), and ER increases across these groups (Garnefski & Kraaij, 2006). Medical research often uses 15 years old as a cut off point for the older adolescent period (Bleyer & Albritton, 2003). It would also be useful to split the adolescent sample into three age groups (younger, middle, and older adolescents) in order to examine any variations in gender differences across adolescence in more detail; however, the cell counts in the cross-

tabulations did not allow for disaggregation at this level, and so younger and older adolescent groups were examined in the present study.

To ensure that the age groups were homogenous enough to conduct the statistical analyses, a one-way analysis of variance (ANOVA) was conducted on the age groups to test the hypothesis that the mean age of each group was statistically significant from the other age groups. This test was significant,  $F(2,460) = 1285.30, p < .001$ . Post-hoc  $t$ -tests with Bonferroni correction revealed that the mean age of each group significantly differed from the other groups. The means, standard deviations,  $p$ -values and direction of results for the post-hoc tests are shown in Table 4.2.

#### 4.3.3. Procedure

The present study was granted ethical approval by the University of Strathclyde Ethics Committee (reference number: UEC15/70). The study took place either in secondary school classrooms (for the adolescents) or online (for the adults). Participants received an information sheet (Appendix A) at the beginning of the study which contained details about what the study involved. Participants were then free to decide whether or not they would like to take part in the study. All participants provided informed consent on either a paper

**Table 4.2**

*Mean (M) Age, Standard Deviation (SD), P-Values, and Direction of Relationships for ANOVA and Post-Hoc Tests for Differences in Age Between the Groups*

<b>Age group</b>	<b><i>M</i></b>	<b><i>SD</i></b>
Young adolescents	12.93	.75
Older adolescents	15.53	.70
Adults	23.91	3.76
<b>Post-hoc comparison</b>	<b><i>p</i></b>	<b>Direction</b>
YA v OA	<.001	OA > YA
YA v Ad	<.001	Ad > YA
OA v Ad	<.001	Ad > OA

*Note.* YA refers to younger adolescents, OA is older adolescents, and Ad is the adult age group.

(adolescents) or online (adults) consent form (Appendix B), and for participants under 16 years old, opt-out parental consent was also obtained using a paper consent form. Once consent was obtained, participants self-reported their age, gender, whether or not they could read and write in English, and SES (Appendix C). SES was measured using the Family Affluence Scale (Boyce et al., 2006) for adolescents, and by asking about the highest level of education achieved (which can be an indication of SES; World Health Organisation, 1988) for the adult participants. Information about ER strategies was captured qualitatively using open-ended questionnaires, which are described in the next section. The full questionnaire is included in Appendix D. The adolescent participants completed the questionnaire in pen and paper format in school during class time, and the adults completed the questionnaire online via the survey platform Qualtrics.

To reverse any potential negative affect brought about during the study, a modified Velten (1968) Positive Mood Induction Procedure (MIP) was included at the end of the study (Appendix E). This method involves participants reading positive sentences and has consistently been associated with an increase in positive mood (Teasdale & Russell, 1983). Once the participant responses had been collected, the participants were provided with a debriefing sheet which contained additional details about the purpose of the study, researcher contact information, and sources of additional support for participants (Appendix F).

#### **4.3.4. Materials**

A novel questionnaire was designed for the purposes of the present study, to allow for the self-reported use of different ER strategies to be measured in an emotion-specific manner. Participants were firstly asked to provide demographic information on their (1) age (What is your age?), (2) gender (What is your gender? Male or Female), (3) whether they could read and write in English (Can you read and write in English?). Participants were invited to free-

write about a recent situation during which they experienced sadness, anger, or fear, and then to write about what they did to try to reduce this emotion (i.e., their ER strategies).

Participants were encouraged to report any other things they do to reduce sadness, anger, or fear.

The questionnaire consisted of three questions for each emotion:

1. Think about a time recently when you felt sad/angry/scared, and you did something to try to make yourself feel less sad/angry/scared. Describe what happened to make you feel sad/angry/scared in the box below.
2. When you felt sad/angry/scared during this time, what did you do to try to make yourself feel less sad/angry/scared?
3. Can you think of any other things you have done in the past to make yourself feel less sad/angry/scared?

#### ***4.3.5. Coding and Analysis***

**4.3.5.1. Coding the Data.** Existing methods of conducting research on ER offer few options to measure ER in an emotion-specific manner, and they often measure only a small number of strategies and miss out important strategies. The approach developed for Study 1 aimed to address these limitations. This approach involved collating the text responses from the open-ended questionnaire and then processing and coding these into ER strategies. These ER strategies were then coded into wider categories of ER using a framework developed by Parkinson and Totterdell (1999), which allows for the engagement hypothesis (i.e., that females are more likely to engage with their emotions during regulation) to be tested. A bottom-up, data-driven approach was adopted in this process, which involved categorisation being guided by the content of the data, and the researcher's knowledge of the ER literature. Individual strategies were focused upon initially, rather than focusing on categories derived

from a theoretical framework, to ensure that the richness in the data was captured. The danger in coding the data items into broad categories too early is that the caveats of individual strategies could be lost. Therefore, a data-driven approach was chosen to ensure that that rich information available in the data was represented in the coding process. This process involved four stages, which are described below.

*Stage 1: Preparation of the data.* Each participant's text data was entered into and collated on a Microsoft Excel spreadsheet. Raw data items were identified based on the smallest meaningful action that could be regarded as a way to regulate an emotion. For example, the response 'I went out with my friends and played football', was separated into two data items – (1) went out with friends, and (2) played football. The aim of this stage was to prepare the data for coding into ER strategies.

*Stage 2: Coding of ER strategies.* The data were then coded into individual ER strategies, based on the content of the data items, and the researcher's knowledge of ER strategies from the theoretical and empirical literature. The purpose of this stage was to build a data corpus of ER strategies, and to capture the diversity of strategies used within the sample. If a participant reported an ER strategy at least once this was coded as '1', and if they did not report an ER strategy it was coded as '0'. This produced a range of ER strategies which were dichotomous variables (Yes, No).

This stage yielded 132 unique ER strategies and included some of the most commonly reported strategies in the literature, including acceptance, avoidance, distraction, reappraisal, rumination, expressive suppression, and seeking social support (although some of these were reported in low numbers). The definitions used to code some of the most frequently reported ER strategies are found in Table 4.3.



**Table 4.3***Definitions Used to Code the Data Items into ER Strategies in Study 1*

<b>Definition of top ER strategies</b>	
<b>ER strategy</b>	<b>Definition/data items included</b>
Avoid the situation	Ignoring or avoiding the emotional situation
Creative/relaxing activity	Taking part in an activity with the intent of relaxing or doing something creative (as opposed to distracting)
Distraction	Thinking or doing something unrelated to the emotional situation, or when participants explicitly reported that they distracted themselves (without specifying how this was achieved)
Experiential avoidance	Trying not to feel the emotion
Hostility to others	Taking the emotion out on others (e.g., shouting at someone, being violent towards them)
Leave emotional situation	Leaving the situation that triggered the emotion
Listen to music	Listening to music
Memories	Thinking about happy memories
Problem solving (action)	Taking action to solve the problem that triggered the emotion (this is distinguished from problem solving cognitively by strategizing or thinking differently).
Reappraisal	Changing one's thoughts about the situation, reframing the situation, changing your mindset, having happy thoughts
Removing attention	Removing the attention from the situation, e.g., by closing your eyes
Rumination	Thinking about the situation in detail, dwelling on it, thinking about the causes and consequences of the situation
Self-talk	Talking to yourself in a positive way, reassuring yourself, encouraging yourself
Social support	Turning to others for comfort, talking about the situation with others, spending time with others
Sports/exercise	Taking part in a physical activity such as sports or exercise
Take time out	Taking a break, spending time on your own, resting, taking time out
TV/movies	Watching a TV or movie
Venting/expressing emotion	Outwardly expressing emotion, ranting to others, crying, hitting/punching things, letting out emotion

*Stage 3: Coding of wider ER categories.* These specific ER strategies were then coded into three broader ER categories – engagement, disengagement, and distraction. First, this involved deciding whether a strategy was an engagement strategy or a diversion strategy. A diversion strategy could then be categorised as a type of disengagement or distraction. Of the 132 unique strategies identified, 52 (39%) were classed as engagement, 19 (14%) were disengagement strategies, and 39 (30%) were categorised as distraction. Some strategies were judged to encompass aspects of both engagement and disengagement, and so these were coded as ‘multipurpose’ and were excluded from further analysis. This applied to 22 (17%) of the ER strategies. The following guidance, which was adapted from Parkinson and Totterdell (1999), was used to code the ER strategies into these wider ER categories:

1. Is the strategy intended as a way of addressing or avoiding the problem or related affect? Engagement strategies involve sustained attention to, or work on, the problem or affect. Diversion strategies involve redirecting cognition or action away from the problem or affect.

2. If the strategy is a diversion strategy, is the strategy simply avoidant (disengagement), or does it explicitly involve actively thinking about (or doing) something else in order to divert attention from the concern (distraction)? Disengagement strategies include avoiding thinking about the problem or affect and avoiding the problematic situation.

As with the specific ER strategy stage, if a participant reported using a type of ER at least once then this was coded as ‘1’, and if they did not report a type of ER, it was coded as ‘0’. This stage yielded the dichotomous variables of engagement, disengagement, and distraction ER. The top ER strategies included in each wider category are found in Table 4.4. Almost half of the category of engagement was made up of expressing/venting emotions and social support. Over half (65%) of the disengagement category consisted of experiential avoidance (trying not to feel the emotion), leaving the situation (leaving a situation that you

are in when experiencing the emotion), and avoiding the situation (not attending the emotional situation in the first place). Around a third (35%) of the distraction category was made up of listening to music and watching TV or movies. A full list of ER strategies included in each category is found in Appendix G.

*Stage 4: Reliability analysis.* Reliability analyses were conducted to test the reliability of the coding process, both for the individual ER strategies, and for categorisation into the wider engagement, distraction, and disengagement categories. Two coders - the author and an undergraduate student who was assisting with the coding - completed the coding process independently, and interrater agreement was tested using Cohen's  $\kappa$ . Cohen's  $\kappa$  is considered a conservative test of interrater agreement as it does not take into account chance agreement.

**Table 4.4**

*Top ER Strategies That Make up the Wider ER Categories of Engagement, Disengagement and Distraction*

<b>ER strategies</b>	<b>% of ER category</b>
<b><u>Engagement</u></b>	
Express/vent emotion	24.48%
Social support	17.39%
Problem solving (action)	10.31%
Reappraisal	9.98%
Self-talk	5.19%
<b><u>Disengagement</u></b>	
Experiential avoidance	33.24%
Leave emotional situation	21.97%
Avoid situation	10.14%
Hostility to others	7.61%
Go to room	5.63%
<b><u>Distraction</u></b>	
Listen to music	18.29%
TV/movies	16.27%
Distraction	11.34%
Creative/relaxing activity	10.21%
Sports/exercise	10.21%

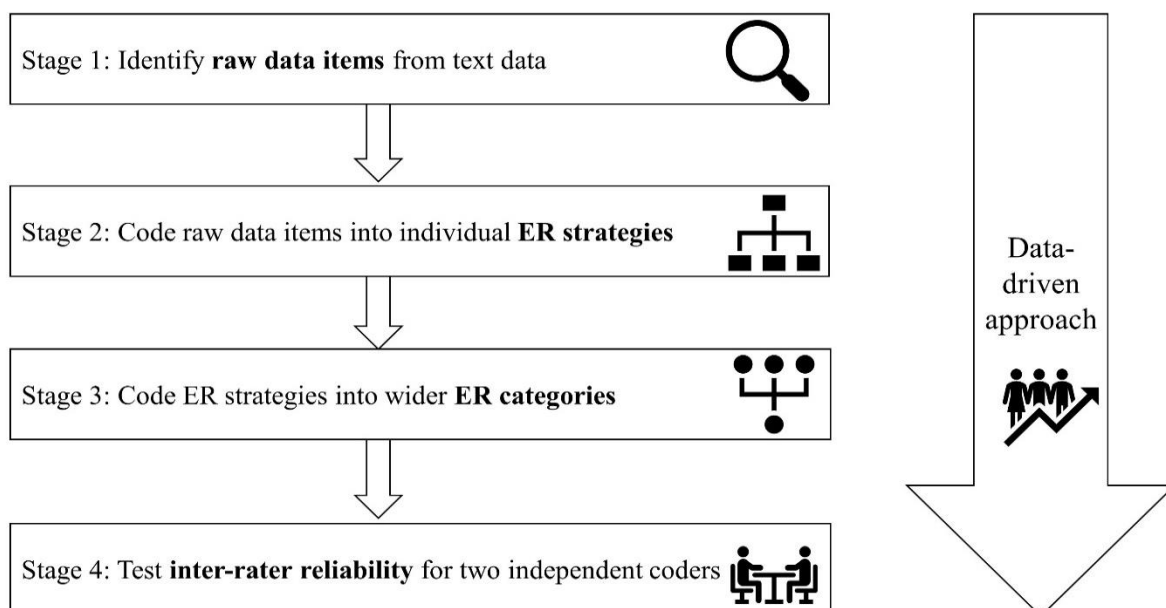
Cohen (1960) suggested that  $\kappa$  could be interpreted as follows:  $\leq 0$  is no agreement, 0.01 - 0.20 is none to slight agreement, 0.21 - 0.40 is fair agreement, 0.41 - 0.60 is moderate agreement, 0.61 - 0.80 is substantial agreement, and 0.81 - 1.00 is almost perfect agreement.

The first reliability analysis, which tested the extent to which the two independent coders categorised the ER strategies (such as social support, venting/expressing emotion etc.) in the same way, showed that Cohen's  $\kappa$  was  $\kappa = .67$ , which represents substantial agreement between the coders, according to Cohen's (1960) classification. The second analysis tested the agreement between the two coders that the ER strategies should be allocated into the categories of (1) engagement, (2) disengagement, or (3) distraction ER. Cohen's  $\kappa$  was  $\kappa = .59$ , which is considered a moderate level of agreement according to Cohen's (1960) original interpretation of  $\kappa$ . Although this is an acceptable level of interrater agreement by Cohen's standards, it should be noted that this is generally on the lower end of what is considered acceptable (M. L. McHugh, 2012). Therefore, there was substantial agreement between the coders for the ER strategies, and there was moderate agreement for the wider ER categories.

The stages of coding the data for the present study are summarised in Figure 4.1.

**Figure 4.1**

*The Data Coding Process for Study 1*



**4.3.5.2. Analytical Approaches for Exploring the Research Questions of the Present Study.** Three analytical approaches were implemented to explore the research questions of the present study. Cochran's Q tests were used to investigate whether reported ER strategies vary by emotion (SRQ1). Chi-square analyses on ER strategies were used to explore whether there are emotion-specific gender differences in reported ER (SRQ2). Chi-square tests on the wider ER categories were used to test there are gender differences in engagement, disengagement, and distraction (SRQ3). In the following sections, the analytical approaches that were used in the present study will be described in more detail.

**4.3.5.2.1. Approach for Testing Emotion-Specific Differences in Reported ER Strategies.** In order to explore the key ER strategies that are used to regulate sadness, anger, and fear, and to test whether the key strategies vary according to the specific emotion being regulated, some of the most frequently reported strategies were selected to examine the percentage of individuals who reported using this strategy, and to compare these percentages between the specific emotions. Any number of strategies could be chosen for this analysis. However, the top 15 strategies for each emotion were chosen because this includes approximately 75% of the total recorded responses. The final 25% of responses included between 65-68 of the remaining ER strategies, depending on the emotion. It should be noted however that the extent to which the top reported strategies vary between specific emotions will depend on the number of top strategies that are examined (e.g., comparing the top 10 strategies will show a slightly different result than comparing the top 15 strategies), although the general pattern is the same.

In addition, Cochran's Q tests were used to assess whether the proportion of the sample reporting a particular strategy varied between the emotions (e.g., was the percentage of participants reporting social support significantly different for sadness, anger, and fear?). Cochran's Q is used to compare dichotomous dependent variables between three or more

related groups (Laerd Statistics, 2017). As a large number of strategies (132) were reported in total, it was not practical to run inferential analyses on every reported ER strategy. Therefore, a selection of ER strategies was chosen for further analysis using Cochran's Q.

The first selection criterion was that if an ER strategy appeared in the top 5 reported strategies for any emotion, then this strategy would be tested using Cochran's Q. This yielded a list of 10 strategies – social support, sports/exercise, listening to music, watching TV/movies, expressing/venting emotion, hostility to others, taking time out, problem solving (action), reappraisal, and self-talk. In addition, the second criterion was that most commonly researched strategies in the field were also chosen for analysis in order to compare the results of the present research to the wider literature. These 5 strategies were distraction, avoiding the situation, experiential avoidance, passivity, and rumination. Therefore, 15 strategies in total were analysed using Cochran's Q tests, as reported in Section 4.4.2.

#### ***4.3.5.2.2. Approach for Testing Gender Differences in Individual Emotion***

***Regulation Strategies.*** Due to the exploratory nature of this study, participants were invited to spontaneously report on their ER without any prompting. Consequently, this meant that although the overall sample size for Study 1 was healthy, the sample size for the reporting of some strategies was too small to enable chi-square analysis to be conducted. For this reason, gender differences could not be tested for the majority of ER strategies reported. However, as the top five reported strategies for each emotion had a sufficient sample size, the relationship between gender and each of these strategies was analysed using chi-square analysis. Also, if a strategy that is salient in the ER literature was reported but did not appear in the top five strategies (such as acceptance, reappraisal, distraction, suppression, rumination, self-harm, or avoidance) and was reported by a sufficient number of people, gender differences in the use of this strategy were also tested. At this stage, the analyses were not disaggregated by age

group because doing so resulted in low cell counts which meant that the chi-square analysis could not be conducted. The results for this analysis are presented in Section 4.4.3.

#### ***4.3.5.2.3. Approach for Testing Gender Differences in Wider ER Categories.***

Gender differences in engagement, disengagement, and distraction were examined, which involved testing the main effects of gender and age first, and then conducting analyses to test for an interaction between gender and age on reported ER strategies.

1. Firstly, the main effect of gender was tested by conducting a series of chi-square analyses examining gender (males, females) as the independent variable (IV), and reported ER strategy for each emotion (Yes, No) as the dependent variable (DV), with age groups collapsed for these analyses (i.e., all age groups were analysed together). This stage involved running the following nine chi-square analyses, the results of which are reported in Section 4.4.4.1: (1) gender x engagement for sadness, (2) gender x engagement for anger, (3) gender x engagement for fear, (4) gender x disengagement for sadness, (5) gender x disengagement for anger, (6) gender x disengagement for fear, (7) gender x distraction for sadness, (8) gender x distraction for anger, and (9) gender x distraction for fear.

2. Chi-square analyses for the relationship between gender and reported ER in each age group were conducted. This tested the interaction between gender and age (i.e., if gender differences in reported ER strategies varied across age groups), and these are reported in Section 4.4.4.2.

As the chi-square tests involve multiple comparisons, the Benjamini-Hochberg correction (Benjamini & Hochberg, 1995) was used to adjust the alphas to reduce the risk of a Type I error occurring in the analysis (i.e., that a significant effect is reported that does not exist). The Benjamini-Hochberg correction involves controlling the expected proportion of falsely rejected hypotheses (Benjamini & Hochberg, 1995). Using this method, the *p*-values for each test are ranked in order from lowest to highest, and each alpha is multiplied by the

number of comparisons divided by the position of the  $p$ -value in the list, to provide the correct alpha for each  $p$ -value (Jafari & Ansari-Pour, 2019). The Benjamini-Hochberg approach was preferred over more conservative methods (such as the Bonferroni correction) as it also controls for the risk of Type II error (i.e., that a significant effect is not reported when it exists) (S.-Y. Chen, Feng, & Yi, 2017; Jafari & Ansari-Pour, 2019), which means that it has more power than other methods (Benjamini & Hochberg, 1995). It is appropriate to use Benjamini-Hochberg corrections when there are a large number of hypotheses being tested (S.Y. Chen et al., 2017), which is the case in the present study.

## **4.4. Results**

### ***4.4.1. Data Screening and Assumptions***

**4.4.1.1. Missing Data.** The data were analysed for patterns in the missing values. Missing values meant that the participant had left a question blank in the questionnaire (e.g., the sadness question) which meant that no data was available to subsequently be categorised as an ER strategy for this emotion. Missing data variables were computed by categorising each participant as having either (1) a missing value or (2) no missing value for each question in the questionnaire. Chi-square analyses were conducted to test if there was a relationship between (1) age (young adolescents, older adolescents, adults) or (2) gender (males, females) and whether or not there were missing values (missing, not missing).

Overall, the responses for some emotions had a larger proportion of missing data than others. There were approximately 4% missing values in the sadness data, 11% missing in the anger data, and 23% missing in the fear data. One potential reason for this difference in the reporting of strategies is that there may be fewer opportunities for experiencing fear in everyday life compared to the other emotions, and so participants may have fewer examples to report the ER strategies for this question.



Another reason for this finding may be the presence of an order effect. During the procedure, the questions were presented in a particular order – the sadness question appeared first, followed by the anger question, and then the fear question. The pattern in the missing values may be due to presenting the questions in this order for all participants. In the wider literature, there is often more missing data in later questions due to participant fatigue when questions have not been counterbalanced (Egleston et al., 2011), and questionnaires that use open-ended questions tend to produce more missing data than those with closed questions (Reja et al., 2003).

Table 4.5 shows the percentage of missing data for gender, sadness, anger, and fear, across the different age groups, and the results of the chi-square analyses testing the relationship between these variables and whether or not there was missing data. The percentage of missing data in the sadness question appears to differ across some of the age groups, with older adolescents having higher levels of missing values compared to adults. The older adolescents were the group with the highest percentage of missing values. The

**Table 4.5**

*Missing Data for Each Variable Broken Down by Age Group, Showing the Number (n) And Percentage (%) Of Missing Values*

Study 1 Variables	YA		OA		Ad		Total		$\chi^2$	<i>p</i>	Post-hoc tests		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%			Y-O	Y-A	O-A
Age	-	-	-	-	-	-	5	1.07	-	-	-	-	-
Gender	0	0.00	0	0.00	0	0.00	0	0.00	-	-	-	-	-
Sadness data	12	4.48	9	8.26	0	0.00	21	4.49	<b>7.57</b>	<b>.02</b>	.15	.04	<b>.01*</b>
Anger data	29	10.82	15	13.76	4	4.65	50	10.68	4.44	.11	-	-	-
Fear data	66	24.63	27	24.77	14	16.28	108	23.08	2.78	.25	-	-	-

*Note.* The abbreviations used in this table are as follows:

YA is the Young Adolescent age group, OA are Older Adolescents, Ad are Adults,  $\chi^2$  is the chi-square value, *p* is the *p*-value, Y-O refers to the follow up chi-square analysis comparing the Young Adolescent and Older Adolescent age groups, Y-A is Young Adolescents v Adults, and O-A is Older Adolescents v Adults.

Significant values are in bold. Follow up tests were corrected for multiple comparisons using the Benjamini-Hochberg method. For the follow up tests, the symbol \*\*\* denotes significance at the *p* < .001 level, \*\* is *p* < .01 level, and \* is *p* < .05 level after correcting for multiple comparisons.

missing data may be due to these younger participants becoming more easily fatigued than adults when responding, or having more difficulty recalling their ER strategies, although this does not explain why the younger adolescents did not have higher levels of missing values for this question.

Similarly, Table 4.6 shows the percentage of missing data for age, sadness, anger, and fear, across the gender groups, and the results of the chi-square analyses testing for patterns in the missing data. There were gender differences in the proportion of missing values. Specifically, males had a higher percentage of missing data than females, for all three emotions questions. This may indicate that males had more difficulty recalling their ER strategies or were less able to verbalise these strategies. The implications of these findings are that any gender differences in reported ER should be interpreted with caution in the main analysis.

**Table 4.6**

*Missing Data for Each Variable Broken Down by Gender, Showing the Number (n) And Percentage (%) Of Missing Values*

Study 1 Variables	Males		Females		Total		$\chi^2$	<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Age	4	2.01	1	0.37	5	1.07	-	-
Gender	-	-	-	-	0	0.00	-	-
Sadness data	16	8.04	5	1.86	21	4.49	<b>10.20</b>	<b>.001</b>
Anger data	30	15.08	20	7.43	50	10.68	<b>7.00</b>	<b>.08</b>
Fear data	67	33.67	41	15.24	108	23.08	<b>21.88</b>	<b>&lt;.001</b>

*Note.*  $\chi^2$  refers to the chi-square value, *p* is the *p*-value. Significant values are in bold.

To address the missing data problem, listwise deletion was used. Listwise deletion involves excluding any cases with missing data from analysis. It is appropriate to use listwise deletion when loss of power is tolerable (Curley et al., 2019), as is the case with the present data set. Missing data is more problematic in studies with smaller samples (Tabachnick &

Fidell, 2014), and since the present study has a substantial sample size, it was judged that the missing data is not a serious violation of assumptions. Therefore, missing values were addressed using listwise deletion.

**4.4.1.2. Assumption of Chi-Square Analysis: Cell Counts.** In order to run chi-square analysis, all cells in the cross-tabulation must have an expected cell count that is greater than 5 (Laerd Statistics, 2016). Most of the cross-tabulations met this assumption. However, three of the cross-tabulations had at least 1 cell with an expected cell count of less than 5. For these tests, Fisher's exact test was reported, which provides a more accurate  $p$ -value when cell counts are low (Laerd Statistics, 2016), and these tests are indicated by the 'a' symbol.

#### ***4.4.2. The ER Strategies Reported for Specific Emotions***

Across all emotions, 3,377 counts of ER strategies were reported in total (which includes the same strategy being reported more than once by a participant). Females provided more responses than males, with 67% of all responses being reported by females, and 32% being reported by males. Interestingly, participants reported a large number of unique ER strategies – 132 different ER strategies were reported in total. Females also reported more unique strategies than males. Across all emotions, females reported 116 unique strategies, and males reported 84 unique strategies. There was no single strategy that dominated the data, although the top reported strategy (seeking social support) made up around a fifth of recorded responses (see Table 4.7).

The 15 most frequently reported strategies for each emotion are shown in Table 4.7. This table shows the number of times a strategy was reported (and so includes strategies that were reported by the same individual multiple times). The top strategy reported for sadness and fear (for both males and females) was seeking social support.

**Table 4.7**

*Frequency (Freq) Of ER Strategies Reported, and Percentage (%) Of the Total Strategies Reported for Males and Females, and for Sadness, Anger, and Fear*

<b>Emotion</b>	<b>ER strategy</b>	<b>Males</b>		<b>Females</b>		<b>Total</b>	
		<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>
<b><u>Sadness</u></b>	Social support	75	15.79	201	21.34	278	19.54
	Sports/exercise	54	11.37	66	5.94	110	7.73
	Listen to music	21	4.84	59	7.01	89	6.25
	TV/movies	28	5.89	56	5.73	83	5.83
	Express/vent emotion	11	2.32	54	6.26	71	4.99
	Creative/relaxing activity	29	4.00	41	4.14	58	4.08
	Experiential avoidance	15	6.11	39	2.65	54	3.79
	Reappraisal	23	2.74	39	4.14	52	3.65
	Distraction	19	3.58	35	3.72	52	3.65
	Memories	13	2.53	34	3.61	46	3.23
	Comfort eating	3	0.63	41	4.35	44	3.09
	Problem solving (action)	21	4.42	21	2.23	42	2.95
	Take time out	15	3.16	25	2.65	40	2.81
	Sleep	15	3.16	23	2.44	39	2.74
	Video games	26	5.47	7	0.74	34	2.39
<b><u>Anger</u></b>	Express/vent emotion	65	17.86	121	16.13	187	16.73
	Social support	26	7.14	98	13.07	124	11.09
	Sports/exercise	33	9.07	61	8.13	94	8.41
	Hostility to others	15	4.12	40	5.33	55	4.92
	Take time out	21	5.77	31	4.13	52	4.65
	Listen to music	11	3.02	37	4.93	48	4.29
	Leave emotional situation	8	2.20	29	3.87	37	3.31
	TV/movies	19	5.22	14	1.87	34	3.04
	Creative/relaxing activity	9	2.47	23	3.07	32	2.86
	Problem solving (action)	12	3.30	19	2.53	31	2.77
	Reappraisal	11	3.02	19	2.53	30	2.68
	Experiential avoidance	15	4.12	15	2.00	30	2.68
	Breathing techniques	7	1.92	20	2.67	27	2.42
	Sleep	13	3.57	11	1.47	25	2.24
	Self-calming	5	1.37	17	2.27	22	1.97
<b><u>Fear</u></b>	Social support	95	12.60	31	16.70	126	15.42
	Problem solving (action)	52	11.79	29	9.14	81	9.91
	Reappraisal	51	3.66	9	8.96	60	7.34
	Self-talk	30	4.47	11	5.27	41	5.02
	Express/vent emotion	35	2.03	5	6.15	40	4.90
	Leave emotional situation	21	6.10	15	3.69	36	4.41
	Experiential avoidance	23	4.47	11	4.04	34	4.16
	Distraction	23	2.44	6	4.04	29	3.55
	TV/movies	16	4.88	12	2.81	28	3.43
	Listen to music	20	2.44	6	3.51	26	3.18
	Seek comfort	5	2.03	20	3.51	25	3.06
	Creative/relaxing activity	6	2.44	13	2.28	21	2.57
	Breathing techniques	6	2.44	14	2.46	20	2.45
	Attentional deployment	8	3.25	11	1.93	19	2.33
	Passivity	11	4.47	8	1.41	19	2.33

However, the top strategy reported for anger (for both males and females) was venting or expressing emotion (although social support was still high for anger). Social support, listening to music, watching TV/movies, expressing/venting emotion, creative/relaxing activities, experiential avoidance, reappraisal, and problem solving appeared in the top 15 strategies for all three emotions. Distraction was in the top 15 strategies for sadness and fear, but not for anger.

Thinking of happy memories, comfort eating, and playing video games were reported in the top 15 for sadness, but not for anger or fear. Hostility to others and self-calming were reported in the top 15 strategies for anger, but not for sadness or fear. Finally, self-talk, seeking comfort, attentional deployment, and passivity were reported in the top 15 for fear, but not for sadness or anger.

Eleven out of the fifteen top strategies reported for sadness and anger were the same, and ten out of fifteen strategies were the same for anger and fear. Sadness and fear shared nine out of fifteen strategies. This means that sadness and anger shared 73% of their top 15 strategies (with 27% being different), sadness and fear shared 60% of their top strategies (40% were different), and anger and fear shared 67% of their top strategies (33% were different).

In order to have a sufficient sample size to run Cochran's Q tests, the sample size ( $n$ ) must be equal to or greater than 4, and  $nk$  (the sample size,  $n$ , multiplied by the number of related samples,  $k$ ) must be equal to or greater than 24 (Laerd Statistics, 2017). Also, responses where scores are the same for related groups are subtracted when calculating the sample size (e.g., cases that scored 'No' across all emotions). All of the ER strategies in the present study, except suppression, met this assumption. Suppression was reported in numbers too low to enable further analysis ( $n = 3$ ).

The results of the Cochran's Q tests are shown in Table 4.8. For all ER strategies, with the exception of passivity, there were significant differences in the percentage of participants reporting this strategy for each specific emotion. In other words, the reported use of ER strategies varied between emotions. Follow up tests were conducted using Dunn's test with Bonferroni correction (Laerd Statistics, 2017).

**Table 4.8**

*Cochran's Q Tests Comparing the Percentage of Participants Reporting Each ER Strategy for Sadness, Anger, and Fear*

ER Strategy	Sadness		Anger		Fear		Cochran's Q		Post-hoc tests		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	Q	<i>p</i>	S-A	S-F	A-F
Avoid situation	4	0.85	14	2.99	16	3.42	<b>7.52</b>	<b>.02</b>	.10	<b>.03</b>	1.00
Distraction	46	9.83	18	3.85	26	5.56	<b>16.64</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>.01</b>	.77
Avoidance	50	10.68	0	0.00	34	7.26	<b>49.52</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	.08	<b>&lt;.001</b>
Hostility	8	1.71	51	10.90	2	0.43	<b>72.64</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	1.00	<b>&lt;.001</b>
Listen to music	86	18.38	47	10.04	25	5.34	<b>53.51</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>.03</b>
Passivity	12	2.56	10	2.14	16	3.42	<b>1.65</b>	<b>.44</b>	-	-	-
Problem solving	38	8.12	28	5.98	70	14.96	<b>23.87</b>	<b>&lt;.001</b>	.80	<b>.001</b>	<b>&lt;.001</b>
Reappraisal	47	10.04	25	5.34	57	12.18	<b>15.46</b>	<b>&lt;.001</b>	<b>.03</b>	.69	<b>&lt;.001</b>
Rumination	7	1.50	2	0.43	12	2.56	<b>7.14</b>	<b>.03</b>	.54	.54	<b>.02</b>
Self-talk	16	3.42	8	1.71	36	7.69	<b>26.00</b>	<b>&lt;.001</b>	.47	<b>.001</b>	<b>&lt;.001</b>
Social Support	192	41.03	98	20.94	107	22.86	<b>71.74</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	1.00
Sports/exercise	86	18.38	76	16.24	4	0.85	<b>90.29</b>	<b>&lt;.001</b>	.87	<b>&lt;.001</b>	<b>&lt;.001</b>
Take time out	38	8.12	48	10.26	9	1.92	<b>30.78</b>	<b>&lt;.001</b>	.51	<b>&lt;.001</b>	<b>&lt;.001</b>
TV/movies	64	13.68	31	6.62	26	5.56	<b>26.93</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	1.00
Venting	60	12.82	130	27.78	37	7.91	<b>84.81</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	.09	<b>&lt;.001</b>

*Note.* The abbreviations in this table are as follows – *n* refers to the number of participants who reported that strategy, % is the percentage of the sample that reported that ER strategy, S-A is the post-hoc test comparing sadness and anger, S-F is the post-hoc test comparing sadness and fear, A-F is the post-hoc test comparing anger and fear. Significant values are in bold. Post-hoc tests were carried out using Dunn's test with Bonferroni correction for multiple comparisons.

In terms of the strategies people use when they feel sad, more people reported using distraction, listening to music, watching TV or movies, or seeking social support when they feel sad compared to when they feel angry or scared.

In relation to anger, more people report that they express or vent their emotions, or are hostile to others when they feel angry, compared to when they feel sad or scared. More participants also reported listening to music more when they feel angry than when they feel scared. Similarly, a higher percentage of participants reported using sports or exercise, or taking to time out, to regulate sadness or anger compared to fear.

When individuals feel scared, they are more likely to report problem solving by taking action or talking to themselves (in a reassuring way) than when they feel sad or angry. A higher proportion of participants reported avoiding the situation when they feel scared compared to sad. More people reported ruminating when they feel scared compared to angry. Also, people were more likely to use reappraisal and experiential avoidance to regulate sadness or fear than anger. There were no differences in the use of passivity between the emotions, which was the only strategy that did not have emotion-specific differences.

#### ***4.4.3. Gender Differences in Emotion Regulation Strategies***

For strategies that were reported by a substantial number of participants (i.e., they yielded a cell count of over 5 in the cross-tabulation), chi-square analyses were conducted to test for gender differences in the reporting of these strategies to regulate sadness, anger, and fear, across all age groups.

As shown in Table 4.9, more females than males reported seeking social support when they felt sad, angry, or scared. Females were also more likely than males to report listening to music, but this was found only for sadness (this was not tested for anger or fear as the cell counts were too low to run the chi-square analysis with sufficient power).

**Table 4.9**

*Results of Chi-Square Analyses Testing the Relationship Between Gender (Males, Females), and Reporting an ER Strategy (Yes, No), for Sadness, Anger, and Fear*

ER strategy	$\chi^2$	<i>p</i>	OR	95% CI		% of group reporting ER strategies		Power
				L	U	Males	Females	
<b><u>Sadness</u></b>								
<b>Social support</b>	<b>20.20</b>	<b>&lt;.001***</b>	<b>2.41</b>	<b>1.64</b>	<b>3.56</b>	<b>29.15</b>	<b>49.81</b>	<b>.97</b>
Sports/exercise	1.72	.19	-	-	-	21.11	16.36	.27
<b>Listen to music</b>	<b>14.13</b>	<b>&lt;.001***</b>	<b>2.70</b>	<b>1.59</b>	<b>4.60</b>	<b>10.55</b>	<b>24.16</b>	<b>.90</b>
TV/movies	2.01	.16	-	-	-	11.06	15.61	.29
<b>Venting/expressing</b>	<b>16.48</b>	<b>&lt;.001***</b>	<b>3.81</b>	<b>1.92</b>	<b>7.53</b>	<b>5.53</b>	<b>18.22</b>	<b>.93</b>
Reappraisal	2.41	.12	-	-	-	7.54	11.90	.22
Distraction	4.25	.04	-	-	-	6.53	12.27	.32
Avoidance	1.28	.26	-	-	-	12.56	9.29	.29
<b><u>Anger</u></b>								
Venting/expressing	4.60	.03	-	-	-	22.61	31.60	.46
<b>Social support</b>	<b>20.43</b>	<b>&lt;.001***</b>	<b>3.17</b>	<b>1.89</b>	<b>5.31</b>	<b>11.06</b>	<b>28.25</b>	<b>.98</b>
Sports/exercise	1.82	.18	-	-	-	13.57	18.22	.16
Hostility to others	5.32	.02	-	-	-	7.04	13.75	.50
Take time out	.02	.90	-	-	-	10.05	10.41	.05
Reappraisal	.02	.88	-	-	-	5.53	5.20	.07
<b><u>Fear</u></b>								
<b>Social support</b>	<b>16.96</b>	<b>&lt;.001***</b>	<b>2.70</b>	<b>1.66</b>	<b>4.37</b>	<b>13.57</b>	<b>29.74</b>	<b>.95</b>
Problem solving	1.56	.21	-	-	-	12.56	16.73	.16
<b>Reappraisal</b>	<b>18.98</b>	<b>&lt;.001***</b>	<b>4.59</b>	<b>2.19</b>	<b>9.59</b>	<b>4.52</b>	<b>17.84</b>	<b>.95</b>
Self-talk	4.90	.03	-	-	-	4.52	10.04	.39
<b>Venting/expressing</b>	<b>13.83</b>	<b>&lt;.001***</b>	<b>5.24</b>	<b>2.00</b>	<b>13.70</b>	<b>2.51</b>	<b>11.90</b>	<b>.90</b>
Removing attention	.03	.87	-	-	-	4.02	3.72	.04
Avoid the situation	.17	.68	-	-	-	3.02	3.72	.07
Rumination	.004	.95	-	-	-	2.51	2.60	.05

*Note.* The abbreviations used in this table are as follows:

$\chi^2$  is the chi-square value, *p* is the *p*-value, OR refers to the odds ratio, 95% CI are the 95% confidence intervals, L is the lower confidence interval, U is the upper confidence interval, sample size (*n*) for each chi-square test was *n* = 468, degrees of freedom (*df*) for each chi-square were *df* = 1, alphas ( $\alpha$ ) were adjusted for multiple comparisons using Benjamini-Hochberg correction, symbol \*\*\* denotes significance at the *p* < .001 level, \*\* is *p* < .01 level, and \* is *p* < .05 level after correcting for multiple comparisons, significant values are in bold, power refers to the actual power of the test which was tested post-hoc using G\*Power version 3.1



In terms of emotion-specific findings, compared to males, more females reported expressing or venting emotions when feeling sad or scared, but this gender difference was not found for anger. Furthermore, females were more likely to report using reappraisal when they felt scared, but this gender difference did not emerge for sadness or anger. For the tests that were significant, the odds ratios show that females were over twice as likely to report these strategies.

#### ***4.4.4. The Relationship Between Gender and Engagement, Disengagement, and Distraction***

A series of chi-square analyses were conducted to test the relationship between gender and the wider ER categories (engagement, disengagement, and distraction), and these analyses were run in three stages to test (1) the main effect of gender (Section 4.4.4.1), and (2) the gender by age interaction (Section 4.4.4.2). The cross-tabulations used in these chi-square analyses are found in Appendix H.

**4.4.4.1. Main Effect of Gender.** In the first stage, the relationship between gender and the reported ER categories was examined with the age groups collapsed. The results of the chi-square analyses for this stage are shown in Table 4.10.

Across all age groups, there was a relationship between gender and the use of engagement ER to regulate sadness, anger, and fear. The odds ratios demonstrate that females were around twice as likely as males to report using engagement to regulate sadness, anger, and fear.

**4.4.4.2. Gender by Age Interaction.** In the previous two stages, significant effects emerged for the use of engagement to regulate sadness, anger, and fear, and the use of disengagement and distraction to regulate sadness. Chi-square tests for each of these

**Table 4.10**

*Results of Chi-Square Analyses Testing the Relationship Between Gender (Males, Females) And Each Category of ER – Engagement, Disengagement, and Distraction (Yes, No) Across All Age Groups, for Sadness, Anger, and Fear*

ER type	Emotion	n	$\chi^2$	p	OR	95% CI			% of group reporting strategies		Power
						L	U	M	F		
<b>Engage</b>	<b>Sadness</b>	<b>447</b>	<b>20.40</b>	<b>&lt;.001***</b>	<b>2.42</b>	<b>1.64</b>	<b>3.57</b>	<b>44.81</b>	<b>66.29</b>	<b>.95</b>	
	<b>Anger</b>	<b>418</b>	<b>7.93</b>	<b>.005*</b>	<b>1.80</b>	<b>1.19</b>	<b>2.70</b>	<b>57.65</b>	<b>70.97</b>	<b>.64</b>	
	<b>Fear</b>	<b>358</b>	<b>16.20</b>	<b>&lt;.001***</b>	<b>2.48</b>	<b>1.58</b>	<b>3.87</b>	<b>50.00</b>	<b>71.24</b>	<b>.92</b>	
Disengage	Sadness	446	.83	.36	-	-	-	16.39	13.31	.13	
	Anger	418	2.10	.15	-	-	-	25.29	31.85	.22	
	Fear	357	.003	.96	-	-	-	30.08	30.36	.05	
Distract	Sadness	446	.46	.50	-	-	-	59.56	62.74	.09	
	Anger	419	.93	.33	-	-	-	37.06	41.77	.13	
	Fear	355	.97	.33	-	-	-	23.48	28.25	.08	

*Note.* *n* is the sample size,  $\chi^2$  is the chi-square value, *p* is the *p*-value, OR refers to the odds ratio, 95% CI are the 95% confidence intervals, L is the lower confidence interval, U is the upper confidence interval. Degrees of freedom (*df*) for each chi-square test were *df* = 1, alphas ( $\alpha$ ) were adjusted for multiple comparisons using Benjamini-Hochberg correction. The symbol \*\*\* denotes significance at the *p* < .001 level, \*\* is *p* < .01 level, and \* is *p* < .05 level after correcting for multiple comparisons. Significant values are in bold. Power refers to the actual power of the test which was testing post-hoc using G\*Power version 3.1

variables were conducted, disaggregated by age, to test if gender differences varied across different age groups. The results of this analysis are shown in Table 4.11.

There were gender differences in the use of engagement to regulate sadness and fear in the young adolescent group, but not in the older adolescent or adult age groups.

Specifically, females were over twice as likely to report using engagement to regulate sadness and fear than males. There were no gender differences in the adult group, for distraction or disengagement, or for anger.

**Table 4.11**

*Results of Chi-Square Analyses Testing the Relationship Between Gender (Males, Females) And Each Category of ER – Engagement, Disengagement, and Distraction (Yes, No), Broken Down by Age Group, for Sadness, Anger, and Fear*

ER strategy	Group	n	$\chi^2$	p	OR	95% CI			% of group reporting ER strategies		Power
						L	U	M	F		
<b><u>Sadness</u></b>											
Engagement	YA	<b>256</b>	<b>10.03</b>	<b>.002*</b>	<b>2.25</b>	<b>1.36</b>	<b>3.72</b>	<b>46.28</b>	<b>65.93</b>	<b>.69</b>	
	OA	100	6.28	.01	2.88	1.24	6.66	33.33	59.02	.48	
	Ad	86	3.40	.07	-	-	-	52.63	74.63	.30	
Disengagement	YA	255	.15	.70	-	-	-	19.83	17.91	.06	
	OA	100	.33	.68 <sup>a</sup>	-	-	-	7.69	4.92	.08	
	Ad	86	.20	.70 <sup>a</sup>	-	-	-	15.79	11.94	.08	
Distraction	YA	255	1.04	.31	-	-	-	57.85	51.49	.09	
	OA	100	.85	.36	-	-	-	56.41	65.57	.12	
	Ad	86	.59	.73 <sup>a</sup>	-	-	-	89.47	82.09	.10	
<b><u>Anger</u></b>											
Engagement	YA	239	4.02	.05	-	-	-	53.98	66.67	.31	
	OA	94	.02	.88	-	-	-	59.46	57.89	.05	
	Ad	82	4.10	.06 <sup>a</sup>	-	-	-	72.22	90.63	.30	
Disengagement	YA	239	2.11	.15	-	-	-	24.78	33.33	.17	
	OA	94	.87	.35	-	-	-	24.32	33.33	.08	
	Ad	82	.18	.67	-	-	-	33.33	28.13	.05	
Distraction	YA	240	.18	.67	-	-	-	38.05	35.43	.98	
	OA	94	3.28	.07	-	-	-	27.03	45.61	.29	
	Ad	82	.17	.68	-	-	-	55.56	50.00	.06	
<b><u>Fear</u></b>											
Engagement	YA	<b>200</b>	<b>15.95</b>	<b>&lt;.001***</b>	<b>3.22</b>	<b>1.80</b>	<b>5.76</b>	<b>40.66</b>	<b>68.81</b>	<b>.90</b>	
	OA	82	.01	.94	-	-	-	64.00	64.91	.05	
	Ad	72	.13	.71 <sup>a</sup>	-	-	-	76.92	81.36	.29	
Disengagement	YA	201	1.27	.26	-	-	-	35.87	28.44	.12	
	OA	80	.62	.43	-	-	-	24.00	32.73	.06	
	Ad	72	3.19	.10 <sup>a</sup>	-	-	-	7.69	32.20	.13	
Distraction	YA	199	.10	.75	-	-	-	23.08	25.00	.05	
	OA	80	.28	.60	-	-	-	20.00	25.45	.05	
	Ad	72	.04	1.00 <sup>a</sup>	-	-	-	38.46	35.59	.06	

*Note.* The abbreviations used in this table are as follows:

n is the sample size,  $\chi^2$  is the chi-square value, p is the p-value, OR refers to the odds ratio, 95% CI are the 95% confidence intervals, L is the lower confidence interval, U is the upper confidence interval, M is males, F is females. The degrees of freedom (df) for each chi-square were df = 1

The alphas ( $\alpha$ ) were adjusted for multiple comparisons using Benjamini-Hochberg correction. The symbol \*\*\* denotes significance at the  $p < .001$  level, \*\* is  $p < .01$  level, and \* is  $p < .05$  level after correcting for multiple comparisons.

The symbol <sup>a</sup> denotes that Fisher's exact test was reported due to at least one cell having an expected count of <5. Significant values are in bold.

Power refers to the actual power of the test which was tested post-hoc using G\*Power version 3.1

#### ***4.4.5. Summary of Results***

A total of 132 unique ER strategies were reported, and females reported more strategies than males. Seeking social support was the top strategy reported for sadness and fear, and venting or expressing emotion was the top strategy for anger. Emotion-specific differences emerged in the percentage of participants who reported distraction, hostility, listening to music, problem solving, reappraisal, self-talk, social support, sports/exercise, taking time out, watching TV/movies, or venting/expressing emotion. No emotion-specific differences emerged in the reporting of passivity.

In terms of gender differences, compared to males, females were more likely to report seeking social support when they feel sad, angry, or scared, listening to music when they feel sad, expressing or venting emotions when they feel sad or scared, and using reappraisal when they feel scared. There was no evidence that males were more likely to use any strategy more than females.

In relation to the wider ER categories, females were more likely than males to use engagement to regulate sadness, anger, and fear, when this was examined across all age groups. When age groups were tested separately, the gender differences in engagement remained for sadness and fear in the young adolescent group only. There were no gender differences in disengagement or distraction.

### **4.5. Discussion**

#### ***4.5.1. Results of Study 1***

Some gender differences in the reporting of ER strategies emerged in Study 1, however this depended on (1) the emotion being regulated, and (2) the ER strategy, which is summarised in Table 4.12.

**Table 4.12***Evidence for Study 1*

<b>Research Questions</b>	<b>Evidence</b>
SRQ1. What are the key ER strategies that are reported for sadness, anger, and fear, and do these strategies vary by emotion?	<ul style="list-style-type: none"><li>• Although there was overlap in the top strategies, some of the strategies for each emotion were unique.</li><li>• Sadness and anger shared 73% of their most frequently reported strategies, sadness and fear had 60% of the same strategies, and anger and fear shared 67% of their top strategies.</li><li>• For most of the ER strategies, the percentage of participants reporting the strategy varied by emotion.</li></ul>
SRQ2. Are there gender differences in the reporting of specific ER strategies to regulate sadness, anger, and fear, and do these gender differences vary by emotion?	<ul style="list-style-type: none"><li>• Gender differences emerged for social support, listening to music, expressing emotions, and reappraisal.</li><li>• Some (but not all) of these gender differences in ER varied across emotions.</li><li>• Females were more likely than males to report using reappraisal to regulate fear, but this gender difference did not appear for sadness or anger</li><li>• Compared to males, females were more likely to vent or express their emotions when they felt sad or scared, but this gender difference did not emerge for anger</li></ul>
SRQ3. Are there gender differences in broad engagement, disengagement, and distraction ER categories?	<ul style="list-style-type: none"><li>• Gender differences emerged for engagement, although these were driven by seeking social support and expressing/venting emotion (which made up the majority of the engagement category).</li><li>• There were no gender differences for disengagement or distraction</li></ul>

#### ***4.5.2. What Are The Key ER Strategies That Are Reported for Sadness, Anger, and Fear, and Do These Strategies Vary By Emotion?***

Compared to emotion-general research, there are relatively few studies which examine the variety of ER strategies individuals use to regulate specific emotions. In the present study, between 27-40% (depending on the emotion) of the most frequently reported ER strategies were unique for specific emotions. This indicates that there is some overlap in the main strategies reported to regulate specific emotions, but there are also strategies that are more likely to be used for certain specific emotions over others.

In previous research, often pre-determined ER strategies are measured using self-report questionnaires. This approach is limited because (1) it is unclear if there are variations in the ER used to regulate specific emotions when participants freely report on this, and (2) strategies which are deemed important by the participant may not be captured. The Study 1 approach aimed to address these limitations. Individuals appear to use different ER strategies based on the specific emotion that is being regulated (Dixon-Gordon et al., 2015a; Rivers et al., 2007; Vishkin et al., 2020; Zimmermann & Iwanski, 2014). The results of the present study were consistent with these previous findings, as all of the ER strategies that were tested (with the exception of passivity) varied across the emotions. This result indicates that there are emotion-specific differences in the use of ER.

Specifically, individuals were more likely to seek social support, avoid the experience of the emotion, and use distraction techniques such as listening to music, watching TV or movies, or engaging in sports and exercise when they felt sad. Sadness is often thought to serve a social function by eliciting sympathy and support from others after a loss (Balsters et al., 2013; Lench et al., 2015), and so it is logical that individuals are more likely to seek social support in this specific emotional context. This finding that individuals use social

support more for sadness compared to other emotions was also reported in Zimmermann and Iwanski (2014), which was measured using a closed-ended questionnaire.

In the present study, two types of avoidance were measured – avoidance of the emotional experience (experiential avoidance) and avoiding the emotional situation (avoid the situation). Avoiding the situation was reported more for fear, but experiential avoidance was reported more for sadness. There is evidence that individuals may try to avoid the experience of sadness (Dixon-Gordon et al., 2015a; Zimmermann & Iwanski, 2014), which mirrors the findings of the present research, and may suggest that sadness is viewed as being a less tolerable emotion than others. When people feel scared or angry, they may be more likely to leave or avoid the situation, which was found in the present study and in Rivers et al. (2007). Similarly, individuals in the current study were more likely to take action to solve the problem when they were afraid. This may reflect that anger and fear are more action-oriented emotions than sadness, that prompt us into action in situations which may pose a threat to our survival (fear) or block the attainment of a desired goal (anger) (Lench et al., 2016). In contrast, sadness is associated with reduced activity, as this is thought to reflect the loss of a goal, with no possibility of restoring it (Lench et al., 2016). Thus, it is important that the distinction is made in ER research between experiential avoidance and physically avoiding a situation, as the use of these strategies demonstrated an emotion-specific pattern.

In terms of reappraisal, individuals were more likely to use reappraisal when they feel sad or scared, but less likely to use it for regulating anger. This result mirrors that of Dixon-Gordon et al. (2015a), in which reappraisal was more likely to be used for sadness and anxiety than anger. People tend to regulate low intensity emotions using reappraisal, but regulate higher intensity negative emotions using distraction, which intervenes in the emotional response at an earlier stage (Sheppes et al., 2011). Anger is often understood to be an intense, high-energy emotion compared to sadness which is characterised by reduced

physiological activity, seeking comfort and support rather than taking action (Lench et al., 2016). Furthermore, individuals may feel more justified in their anger experience, particularly if it is caused by a perceived wrongdoing, and so they may be less motivated to change it cognitively using reappraisal. The use of reappraisal to regulate fear may depend on whether or not there is an imminent threat in the environment. It may be the case that individuals will take action if there is an immediate threat to wellbeing, but will use cognitive strategies such as reappraisal to reduce the negative emotion if the threat is imagined or not present.

When individuals feel angry, they are more likely to vent or express their emotions or behave in a hostile fashion towards others. This is consistent with the findings of Rivers et al. (2007), who found that people are more likely to verbally express their anger (compared to sadness), and with Zimmermann and Iwanski (2014), who found that individuals dysregulate their anger more than sadness, such as by blaming others for their emotions. This is consistent with the conceptualisation of anger as being triggered by a perceived injustice which can be remedied with the removal of the goal obstacle (Lench et al., 2016), prompting an action-oriented approach to regulating anger, such as venting emotions or expressing hostility to others.

An additional and unexpected finding that emerged in the current study is that many of the most commonly-researched strategies in the field were reported in relatively low numbers. For example, few people spontaneously reported expressive suppression, mindfulness strategies, or rumination. This may indicate that individuals may not have awareness of their own regulation to be able to accurately report on these ER strategies, particularly unconscious strategies. However, it is also possible that these ER strategies are perhaps not as commonly employed in ER as previously thought. In the present research, behavioural strategies such as seeking social support, expressing emotion, and taking action to solve the problem, rather than cognitive strategies, were more frequently reported to



regulate emotions. One potential reason for this finding may be that individuals have more awareness of their behavioural strategies, and less awareness of any cognitive strategies they may use to regulate their emotions. This reflects the dual process model of ER (described in Section 1.3.2.3), in which it is proposed that many ER strategies occur automatically and outside of conscious awareness (Gyurak et al., 2011).

Another explanation for the high number of reported behavioural strategies is that it is likely that people are taught by caregivers to ‘do’ things when they feel bad, such as seeking social support or solving the problem, rather than being taught to cognitively regulate their emotions such as by using reappraisal (Calkins & Hill, 2007). Thus, it is logical that behavioural strategies were more frequently reported by laypeople in the present study, as these are more explicitly taught. In recent years, more researchers have begun to investigate behavioural ER strategies (Kraaij & Garnefski, 2019), and based on the findings of the present study, this appears to be an important direction for future research.

Two of the most commonly researched strategies are reappraisal and suppression. When ER first began to emerge as a subject of research, these strategies were initially focused upon by Gross and colleagues for theoretical reasons. As mentioned in Section 1.3.2.1, in Gross's (1998b) process model, there are two broad stages of ER - antecedent-focused ER and response-focused ER, and reappraisal and suppression are examples of these stages. Gross's early research strategy involved focusing on a small number of well-defined strategies, and these were strategies that are commonly used in everyday life, lend themselves to both experimental and individual differences research, and are examples of antecedent and response-focused strategies (Gross et al., 2006).

It is unclear how Gross and colleagues initially determined that reappraisal and suppression were commonly used strategies, and thus worthy of further investigation. However, when individuals are asked if they use these strategies (e.g., using the ERQ), some

people do report using reappraisal and suppression in their day to day lives, although there are individual differences in the frequency of use (Gross & John, 2003). However, there is little evidence that these cognitive strategies are necessarily more commonly used than other strategies, such as the behavioural strategies identified in the present study. As previously mentioned, it may also be the case that participants are less able to describe cognitive strategies such as reappraisal and suppression, and/or may use these strategies unconsciously, which would also lead to these strategies not emerging in the data for the present study.

#### ***4.5.3. Are There Gender Differences in the Reporting of Specific ER Strategies, and Do These Vary By Emotion?***

**4.5.3.1. Reporting of Strategies Using the Free-Writing Approach.** Females reported more ER strategies than males, which is in line with previous research (Goubet & Chrysikou, 2019; Rivers et al., 2007; Sanchis-Sanchis et al., 2020). These findings may indicate that females have a wider repertoire of ER strategies and may attempt to regulate emotions several times using multiple strategies during an emotion-eliciting event.

Interestingly, Goubet and Chrysikou (2019) and Rivers et al. (2007) used a similar methodological approach to that used in the present study. Although Goubet and Chrysikou (2019) included many common ER strategies in their study, this was not emotion-specific, and was relating to particular scenarios such as academic life, relationships, and health. In relation to gender differences, they found that females were more likely than males to use social support and emotional expression in the academic and romantic situations, which is consistent with the present study. In the study by Rivers et al. (2007), the regulation of sadness and anger was examined within the context of close personal relationships. Although the approach for collecting data was similar, the resulting ER framework in Rivers et al. (2007) differed from that used in the present study, because strategies were grouped into

broad categories which did not distinguish between some of the most common strategies in the literature (such as reappraisal), and so the findings cannot be compared in this regard. Nonetheless, the use of these similar approaches highlights this method as a promising tool for future research, particularly emotion-specific ER studies, and demonstrates how this approach can be used flexibly to meet the research aims of the study.

**4.5.3.2. Social Support.** Relative to males, females were more likely to report seeking social support when they feel sad, angry, or scared. Females being more likely than males to seek social support from others (particularly emotional support) is a common finding (Barbee et al., 1993; Day & Livingstone, 2003; Kurdek, 1987; Liddon et al., 2018), and so this result is consistent with the wider literature. In Zimmermann and Iwanski (2014), females were more likely to seek social support when they experience negative emotion in general. Although the self-report questionnaire used by Zimmermann and Iwanski (2014) was emotion-specific (i.e., it measured the regulation of sadness, anger, and fear individually), the researchers did not report gender differences in ER in an emotion-specific manner (i.e., all emotions were combined into a single scale). The findings of the present study build on previous knowledge by showing that females are more likely to seek social support for sadness, anger, and fear (i.e., there are no emotion-specific gender differences for this strategy).

**4.5.3.3. Expressing or Venting Emotion.** In the present study, the relationship between gender and expressing/venting emotions varied according to the emotion being regulated. Females were more likely than males to report that they expressed or vented their emotions (e.g., ranting to others, crying, hitting/punching things) when they felt sad or scared, but this gender difference did not appear for anger.

In Rivers et al. (2007), which used a similar method, females were more likely than males to report verbal expression of emotions to regulate both sadness and anger. The finding

that females are more likely to use verbal expression for sadness is in line with the present study, but the finding for anger is inconsistent with the present study. These differences may be due to the definition of expression. In Rivers et al. (2007), verbal expression refers to telling others how you feel, whereas in the present study expression also included non-verbal behaviours such as crying. Also, Rivers et al. (2007) asked people to describe an emotional situation in which they were sad or angry at a close friend, whereas in the present study participants were asked about a more general emotional situation, and so this difference might also account for some variation between Rivers et al. (2007) and the present study.

The gender difference in expressing/venting emotion is in line with studies from the emotional expression literature which show that females are more likely than males to express their emotions (L. R. Brody & Hall, 1993; Kring & Gordon, 1998), particularly sadness and fear (Allen & Haccoun, 1976; Chaplin, 2015; Chaplin & Aldao, 2013).

Generally, in emotional expression research, emotional expressiveness tends to be measured using a self-report questionnaire (Allen & Haccoun, 1976), or in an experimental setting, by eliciting emotion using stimuli (e.g., emotional pictures, films) and measuring participants' outward expressions of emotion such as facial, vocal, and postural expressions, which are coded by trained observers (Kring & Gordon, 1998). These methodologies differ from that used in the present study, which relied on participants recalling situations where they had used venting or emotional expression (e.g., crying or ranting to another person) as a way of regulating their emotions and reporting on this behaviour. Although the methodologies used are different, the results for sadness and fear found in the present study mirror the wider expression literature and suggest that females may be more likely than males to express feeling sad or scared, and to use expressing or venting as a way of regulating these emotions.

The findings for anger are more complex. Some studies have shown that males express anger and overt aggression more than females (Archer, 2004; Chaplin & Aldao,

2013), even in the absence of gender differences in reported levels of anger (Archer, 2004), and females suppress their anger more (Cox et al., 2000; Kwon et al., 2013). On the other hand, females are more emotionally expressive towards anger-inducing stimuli during experimental tasks (Kring & Gordon, 1998; Schwartz et al., 1980; Wagner et al., 1993; Zuckerman et al., 1975). These findings may indicate that other factors, such as the context of the situation (e.g., whether a female feels safe to express her feelings), play a role in whether or not females express feelings of anger (Jack, 2001). They may also point to the hypothesis that females are more emotionally expressive of anger in a laboratory setting, but perhaps have learned to dampen this response by using suppression to align with societal expectations of display rules around anger (Chaplin, 2015).

In the present study, there was not enough evidence to support the hypothesis that gender differences exist in the use of expression/venting to regulate anger. However, it should also be noted that the chi-square test for anger was somewhat less powered (.46) than that for sadness and fear, and so this test may have been less sensitive in detecting a gender difference if one exists (i.e., type II error). As previously noted, the sample size for adults, particularly adult males, was limited, and so a larger sample size amongst this age group may yield different findings. In sum, no gender differences in using venting or expressing emotion to regulate anger were found in the present study.

**4.5.3.4. Reappraisal.** Reappraisal is arguably the most researched strategy in the field of ER (Aldao et al., 2010; Gross, 1998a, 2002). In the present study, females reported using reappraisal more than males, but this gender difference appeared for fear only (not for sadness or anger). This result indicates that when individuals are experiencing fear, females are more likely than males to attempt to change their thoughts about the situation in order to reduce their fear. Interestingly, a higher percentage of males reported engaging in problem solving than reappraisal when they feel afraid, whereas females were equally likely to

reappraisal or problem solve. This highlights that females may be more likely than males to engage in cognitive strategies to cope with their fear, whereas males prefer behavioural strategies such as taking action during fearful situations. These findings are consistent with evidence that females tend to use cognitive ER more than males (Garnefski et al., 2004) and males are more likely to use problem-focused coping whereas females use emotion-focused coping more (Brougham et al., 2009; Folkman & Lazarus, 1980; Pearlin & Schooler, 1978).

Previous findings in the literature regarding gender differences in reappraisal have been mixed. Using self-report questionnaires, previous studies indicate that females report using reappraisal more (R. C. Martin & Dahlen, 2005; Nolen-Hoeksema & Aldao, 2011; Smrtnik-Vitulić & Prosen, 2016; Spaapen et al., 2014), whereas others show that males report using reappraisal more (Esmailinasaba et al., 2016; Öngen, 2010). A potential reason for these mixed findings may be that previous research has failed to measure ER in an emotion-specific manner. In the present study, when specific emotions were measured separately, clearer gender difference emerged. That is to say, there were gender differences in reappraisal for fear (with females being more likely to use reappraisal), but not for sadness or anger. In other words, gender differences in the reported use of reappraisal depended on the emotion being regulated. This finding brings clarity to an area which has previously had complex and mixed findings. This finding also lends support to the value of investigating gender differences in the regulation of specific emotions, and suggests that other researchers may benefit from conducting ER research in an emotion-specific manner moving forward.

**4.5.3.5. Listening to Music.** Some studies have recognised listening to music as a way of regulating emotions and coping with stress (Cook et al., 2019; Kurdek, 1987; Miranda & Claes, 2009; Silverman, 2020). However, it is not a commonly studied strategy, and consequently there are few studies examining gender differences in this ER strategy. In the present study, listening to music was reported more by females (compared to males), and this

gender difference was found for sadness only (this was not tested for anger or fear due to low cell counts in some of the cells of the cross-tabulations).

This finding is consistent with previous research showing that females are more likely than males to listen to music to regulate emotions more generally (Cook et al., 2019; Kurdek, 1987). However, the results of the present research add value to the literature and build on these previous findings by (1) highlighting the importance of listening to music as one of the most common strategies reported to regulate emotions, and so accordingly should receive more attention in the ER literature, and (2) elucidating that gender differences in listening to music occur for sadness specifically.

#### ***4.5.4. Are There Gender Differences in Broad Engagement, Disengagement, and Distraction ER Categories?***

Compared to males, females were more likely to report using engagement strategies to regulate sadness, anger, and fear. When gender differences were tested in each age group separately, gender differences in engagement remained only for sadness and fear, and only for adolescents. Contrary to what was expected, there were no gender differences in disengagement or distraction.

The engagement category mostly consisted of expressing/venting emotion and social support, and so gender differences in engagement were driven by these strategies. However, as previously noted, it is possible that expressing/venting emotion is not an ER strategy as such, but is rather a type of emotional behaviour, and the reporting of expressing/venting emotion may reflect a lack of awareness on the part of the individual as to how they regulate their emotional responses. This lack of awareness is consistent with previous studies, which indicate that ER is often an unconscious process (Gyurak et al., 2011; Timmer-Murillo et al., 2020).

This research question (SRQ3) was largely developed on the basis of observed gender differences in rumination in the literature (D. P. Johnson & Whisman, 2013), which was conceptualised in this research as a type of engagement. However, we can see from the breakdown of ER strategies in the engagement category (see Table 4.4), that rumination did not appear as a top contributor to engagement, and in fact rumination made up only 2% of the engagement category. However, as noted in Section 4.5.3, individuals may not intuitively have an understanding or awareness of using a cognitive ER strategy such as rumination, and so may be less likely to report using this compared to an action-oriented strategy such as seeking social support. Nevertheless, it cannot be inferred that females use engagement as an ER strategy more generally, but rather females are more likely to report using specific strategies such as seeking social support, and these were interpreted as examples of engagement by the researcher, using the chosen framework for this study.

It is possible that this framework, which grouped individual ER strategies into wider categories, was not an appropriate method to sufficiently explore this research question. Instead, examining gender differences in ER at the level of individual ER strategies, as reported in Section 4.4.3, may be a more accurate test of whether females are more likely to use strategies classed as engagement. This approach may be more appropriate to test this hypothesis because it may be the case that females are more likely to use some types of engagement (e.g., rumination) but not others (e.g., reappraisal), and as demonstrated in the present study, this may also depend on the specific emotion. Therefore, the wider categories may be too general to capture these gender differences.

There was no evidence that males were more likely to use any strategy more than females. Females used engagement more than males and they use other strategies just as much as males. This suggests that females appear to have more ER strategies available to them, and these additional ER strategies can be classed as ‘engagement’ ER. However, as



reported in Section 4.4.1.1, there were gender differences in the missing values for all of the emotion questions, with males having a higher percentage of missing values than females for the sadness, anger, and fear questions (Table 4.6). This may indicate that males were perhaps less able to verbalise the strategies that they use to regulate their emotions, or may have had less awareness of these strategies to be able to accurately report them. Therefore, it is possible that males have more difficulty reporting their ER strategies, and were at a disadvantage with the open-ended approach to data collection.

It was surprising that no gender differences emerged amongst the adult group, as the findings from previous studies show gender differences in strategies such as avoidance (Zimmermann & Iwanski, 2014) and distraction (Trives et al., 2016) amongst adults. However, a limitation of the present study was that the sample size for the adult group was small, and there was a particularly low number of adult males ( $n = 19$ ). This low sample size meant that some of the analyses for the adult age groups were quite severely underpowered, and so it would be unlikely to find a gender difference using these tests, even if one did exist (i.e., type II error may have occurred).

A further consideration is the possibility that the categories used to classify the ER strategies were not valid. The agreement between the independent coders for these categories was  $\kappa = .59$ , which is considered a moderate level of agreement, according to Cohen's (1960) original interpretation. However, there is still substantial room for improvement, and this value demonstrates that there was still a degree of disagreement in how the ER strategies were categorised. The framework used in the present research was empirically derived (Parkinson & Totterdell, 1999), however it may be the case that these categories were not an accurate representation of different types of ER. This issue is relevant to all of the results regarding the wider categories – engagement, disengagement, and distraction.

Contrary to what was expected, no gender differences emerged in distraction or disengagement. This finding is surprising considering that gender differences in distraction (Copeland & Hess, 1995; Gomez-Baya et al., 2016; Trives et al., 2016), suppression (Gross & John, 2003; Spaapen et al., 2014), and avoidance (Zimmermann & Iwanski, 2014) have emerged in the wider literature. The lack of gender difference may be due to the definition of the wider ER categories (see Table 4.4.).

The distraction category consisted of different activities to distract from the emotion such as listening to music, watching TV or movies, and sports/exercise, as well as a general distraction strategy. We know from the results of the specific ER strategies (reported in Section 4.4.3), that there are gender differences in some of these activities but not others, and so it is possible that grouping them together into one broad category masks these gender differences. Similarly, disengagement consists of a mix of experiential avoidance (i.e., trying not to feel the emotion) and behaviours such as avoiding the situation. It may be that this category is too broad to detect gender differences that involve disengaging with the emotion.

Furthermore, most of the gender differences in the literature emerged amongst adult participants (Esmailinasaba et al., 2016; Garnefski et al., 2004; Smrtnik-Vitulić & Prosen, 2016; Trives et al., 2016), and as already discussed, the limited sample size in the adult age group and the resulting lack of power in the analysis may have led to potential gender differences being undetected.

In sum, although statistically significant gender differences were found in the use of engagement, these were driven by social support seeking and venting/expressing emotion, and so there was only partial support that females are more likely to use engagement when they are regulating emotions. Furthermore, there were no gender differences in the use of disengagement or distraction, possibly due to low sample size or the definition of these categories. Thus, there was no evidence to suggest that males are more likely to disengage or

distract from their emotions. In hindsight, it is possible that grouping ER strategies into wider categories of engagement, disengagement, and distraction may have not been sufficient to test this hypothesis. Instead, it may be more appropriate to examine gender differences at the level of the individual ER strategy (such as rumination, and reappraisal), as was reported in Section 4.4.3.

#### ***4.5.5. Limitations of this Study***

There are two broad categories of limitations of this study which should be noted – the methodological approach, and the generalisability of the findings. The methodological approach used in the present study relies on individuals being able to accurately recall their past ER strategies. There is evidence from previous research that this method is valuable for measuring ER (Gross & John, 2003; Rivers et al., 2007; Zimmermann & Iwanski, 2014). However, it is possible that individuals may not always be able to accurately recall their ER, and may instead rely on their general beliefs about emotions (Robinson & Clore, 2002). Nonetheless, the vast majority of ER research relies on participants self-reporting either their ER strategies or their levels of emotion, and many important findings have emerged using this approach.

Similarly, the method also depends on individuals having an awareness of their ER processes and emotional experiences. In other words, people must have an understanding of when they are experiencing an emotion, what emotion it is, and what they did when they experienced that emotion. The high percentage of participants reporting on their emotional behaviour (e.g., emotional expression) rather than a regulation strategy may indicate that people have limited insight into this process. Some strategies which are salient in the ER literature, such as suppression, were reported in low numbers in the present study using this participant-led approach. The absence of these ER strategies may not have been reported by

participants because they are unconscious strategies that the individual is not familiar with, or is aware of using.

This difficulty in identifying emotions and ER may be a problem for the younger participants in particular, who may not yet have developed the emotional awareness to be capable of reflecting and reporting on their ER strategies in detail. It is notable that the older adolescents had more missing values than adults, suggesting that they may have had more difficulty to report on their ER strategies. The higher percentage of missing values amongst males (compared to females) also suggests that males may be less able to verbalise their ER strategies or were less aware of them. Nevertheless, despite these missing values, the majority of participants in all groups were able to provide insightful answers to the ER questions, suggesting that these issues probably only affect a minority of participants.

Furthermore, although the overall sample size in the present study was healthy ( $n = 468$ ), the methodological approach relied on individuals spontaneously reporting on ER strategies without prompting. This means that if no participants reported using a particular strategy, then there would be no data for that strategy. Consequently, the number of people reporting some strategies was quite low, and resulted in low cell counts in the cross-tabulations, and unequal cell sizes. This resulted in low power for some of the analyses, and meant that some strategies could not be analysed using inferential analysis. The non-significant analyses with low power should therefore be interpreted with caution, as there is an increased risk of Type II error, i.e., failing to find an effect when one exists (Laerd Statistics, 2016).

A similar issue relates to the group sizes. There was a small number of participants in the adult male group, which suggests that there may be self-selection bias amongst this group which could limit the generalisability of the findings. The main reason for the under-representation of males in the adult age group is that fewer males expressed interest in taking

part in the study. This reflects a wider problem with sampling in social research as a whole, particularly research in psychological sciences. Males are much less likely than females to take part in research (Burg et al., 1997; Dunn et al., 2004; Hille et al., 2005; Markanday et al., 2013; Porter & Whitcomb, 2005; Wild et al., 2001), particularly studies regarding mental health (Woodall et al., 2010). Males are also less likely than females to participate in online surveys (G. Smith, 2008), which was the method for collecting data from adults in the present study. This may be a particular challenge for research which involves emotions or feelings. As previously discussed, males often receive messages that any sort of expression of emotion is not perceived as ‘masculine’ and is generally regarded as less acceptable for males (Chaplin, 2015; Root & Denham, 2010). Anecdotally, some males explicitly expressed to the author during the course of this study that they did not wish to take part because of the research topic.

It is important that future studies examining gender take additional measures to ensure that males are recruited in adequate numbers to enable equal group sizes between males and females. This may involve recruiting males only for a period of time during the recruitment phase, and targeting male-dominated environments, such as traditionally male industries or university courses. The way studies are advertised may result in self-selection bias (Sutton & Edlund, 2019), and so it may be prudent to present the research as examining emotions amongst a range of other variables, to mask the ‘emotional’ aspect of the study in order to increase the attractiveness of the study to males.

A related issue is the potential influence of cultural expectations on the reporting of ER strategies. According to cultural norms, it is generally regarded as less acceptable for males to express feelings of sadness and fear, and for females to express anger (Root & Denham, 2010). Therefore, these beliefs may influence the reporting of emotional expression, and this may result in males feeling less able to report that they express sadness or fear, and

females being less likely to report expressing anger, which would reflect the findings of the present study, at least for sadness and fear.

It should also be noted that the majority of the strategies reported are regarded as adaptive and socially acceptable strategies, such as seeking social support, sports/exercise, listening to music, problem solving etc. It is possible that social desirability (i.e., that the participant wants to present themselves in a favourable light to the researcher) may limit the reporting of perceived maladaptive strategies, which the participant may believe is less acceptable to report. Therefore, there is a risk that the use of maladaptive strategies is under-represented in the present research.

With regards to how generalisable the results are, a relatively narrow age range was chosen for the present study in order to examine if gender differences vary across these age groups, and to control the impact on age on the results. However, it may be the case that these findings cannot necessarily be generalised to people of all ages, such as older adults. Similarly, convenience sampling is often used in psychological research to utilise the availability of student participants on university campuses (Richmond et al., 2015). The sample used in the present study mostly consisted of secondary school pupils and university students, and so caution should be exercised when generalising the findings to the wider population. However, there is evidence that ER amongst undergraduate students is similar to that of the general community (Preece et al., 2019), which lends support to the generalisability of the present study.

#### ***4.5.6. Implications of Findings***

**4.5.6.1. Theoretical Implications.** The present study is one of the first to examine gender differences in the reporting of ER strategies to regulate specific emotions. These findings have important implications for the field of ER. First of all, this research highlights

that what we know about the regulation of one negative emotion cannot necessarily be applied to all negative emotions. None of the key theories of ER (discussed in Section 1.3.2), such as the process model (Gross, 1998b), the dual process framework (Gyurak et al., 2011), or the Parkinson and Totterdell (1999) taxonomy take into account the divergent characteristics of specific emotions in their theoretical frameworks of ER. The field may benefit from the development of emotion-specific theory based on the empirical evidence of the present study.

Furthermore, gender differences in ER have been shown to depend on the specific emotion being regulated. For example, the present study was the first to show that gender differences in the use of reappraisal vary by emotion. This brings clarity to an area that was plagued with contradictory findings, and shows that this emotion-specific approach may provide valuable information about gender differences in the use of other strategies. Therefore, in order to gain a clear understanding of gender differences in ER (and the impact that these relationships may have with outcomes of ER), future research may benefit from being conducted in an emotion-specific manner.

A related point is that there is a lack of available instruments to measure emotion-specific ER. The present research highlights the methodological approach used in the present study as a valid method of measuring the regulation of specific emotions. The flexibility of the approach also means that it could be used to research ER in different contexts or for different emotional intensities, as in studies by Goubet and Chrysikou (2019) and Rivers et al. (2007). However, a caveat of this approach is that it requires a large sample size to enable analysis to be conducted on the resulting ER strategies, as the cell counts in the cross-tabulations are directed by the strategies that participants report (i.e., it cannot necessarily be used to target a particular strategy for analysis, because participants may not report this in great numbers). Nonetheless, this approach has shown to be a valuable method of measuring

emotion-specific ER, and has provided unique information regarding gender differences to the ER literature.

The present study also revealed strategies which may be under-researched as potential areas for growth in the field. In particular, some of the most commonly reported strategies in the present study such as social support, sports/exercise, listening to music, and even expressing or venting emotion (as a way of regulating emotions) do not receive as much attention in the field, whereas cognitive strategies which were not widely reported in the present study, may receive disproportionate attention in the literature, and so this may be an important avenue for future research. Expressive suppression, one of the most frequently studied strategies (Gross & John, 2003; Gross & Levenson, 1993; Kelley et al., 2019; Peters et al., 2019; Rogier et al., 2019; Sullivan & Kahn, 2020; Webb et al., 2012), was reported by very few people in the present study. As of yet, it is unclear if behavioural strategies have an adaptive or maladaptive impact on life outcomes over time, such as on mental health. Thus, the present research has highlighted these strategies as an interesting area for exploration in future research.

**4.5.6.2. Practical Implications.** The findings of the present study also have implications for therapeutic practice. The way that individuals regulate their emotions is known to have an important impact on variables associated with mental health (Garnefski & Kraaij, 2006; Gross & John, 2003; Hu et al., 2014; Kudinova et al., 2016; Zahniser & Conley, 2018). Therapies to tackle poor mental health are moving towards becoming more personalised to the individual (Denny, 2020), and ER training is becoming a more popular method for tackling mental health problems (Gratz et al., 2015; Kiosses et al., 2018; LeBlanc et al., 2020; LeBlanc et al., 2017; Morris et al., 2015; Ranney et al., 2017).

Consequently, it is important to gather data on group differences in ER strategy use, such as gender differences. The benefits of this approach are twofold. Firstly, it highlights



areas which may be problematic for individuals from a certain group. For example, less than 10% of males reported using reappraisal to regulate sadness, anger or fear, which demonstrates that the use of this adaptive cognitive strategy may be being underutilised amongst this group and so males may need to receive more training and support around this strategy.

Secondly, it may uncover strategies which are more likely to already be used by members of a certain group. For example, half of females reported that they seek social support when they feel sad. This demonstrates that many females are already sufficient in reaching out for support when required (although there is still room for improvement), and so females may need less support in this area, but may benefit more from focusing on other strategies. Therefore, the findings of the present study may provide valuable information to practitioners which guides tailoring treatments for mental health problems and clinical disorders to an individual's needs.

A further finding from the present study is that the majority of strategies that individuals reported were behavioural (e.g., seeking social support, listening to music). This highlights that cognitive strategies (such as reappraisal) may be underutilised in the general population. There is a vast evidence base for the benefits of using cognitive strategies for mental health (T. S. Davis et al., 2014; Garnefski & Kraaij, 2006; Gratz et al., 2015; Gross & John, 2003; Hu et al., 2014; Huffziger et al., 2009; Kiosses et al., 2018; Kudinova et al., 2016; LeBlanc et al., 2020; LeBlanc et al., 2017; Morris et al., 2015; Polanco-Roman et al., 2015; Ranney et al., 2017; Zahniser & Conley, 2018).

The lack of reporting on cognitive strategies reveals a potential risk factor for the development of mental health problems. It is clear that many individuals do not have the cognitive skills to cope with intense emotions, which may begin to manifest as poor mental health over time (Brewer et al., 2016; S. L. Johnson et al., 2016; Zahniser & Conley, 2018).

Therefore, it is important that therapies focus on training individuals with these cognitive skills that can help to improve mental health amongst individuals struggling with mental health problems and clinical disorders. Additionally, promoting the cultivation of these skills within the education system may also have benefits for the mental health of the wider population (Macklem, 2011; R. E. Martin & Ochsner, 2016).

Females used social support more than males. As social support is generally regarded as an adaptive strategy with many benefits for mental health (Harandi et al., 2017), this finding indicates that males may be less likely to get the support that they need when they are experiencing intense emotions. There is evidence that the cultural messages males receive about what it means to ask for help (e.g., that it is a sign of weakness), prevent them from seeking social support when they are depressed (Barbee et al., 1993; B. P. Cole & Ingram, 2020), and this may account for the low proportion of males reporting this strategy in the present study (14-29%, depending on the emotion). This finding highlights a potential risk factor for males, and may reflect the higher rates of dying by suicide that are observed amongst males (Dougall et al., 2017; Miranda-Mendizabal et al., 2019; National Records of Scotland, 2021; P. L. Mok et al., 2012; Stark et al., 2004). Therefore, it is important to examine the reasons why males are less likely to reach out for support and investigate the impact that this may have on their mental health and wellbeing, in order to address any barriers males face in seeking support.

#### ***4.5.7. Directions for Future Research***

As discussed in Chapter 3, different methods can be used to investigate ER, and these approaches provide different information about ER. The approach used in the present study represents a departure from previous methods (Gross & John, 2003). A benefit of adopting this approach is that it allowed for emotion-specific variations in the reporting of ER to be

assessed, for the first time, across a wide range of strategies. As discussed in this chapter, this method yielded some interesting findings, including gender and emotion-specific differences in the reporting of ER strategies. These findings therefore bring us closer to understanding the relationship between gender and the regulation of specific emotions.

However, there are also other approaches that can be used to investigate ER. Despite the unique contribution of this study, the method used does not allow for the effectiveness of ER strategies to be assessed. It is important to examine not only whether there are gender differences in the reported use of ER, but also if males and females differ in how successfully they can implement ER strategies to reduce an emotion. This is important, because ER effectiveness is associated with a number of affective, cognitive, and social consequences (John & Gross, 2004).

To measure ER effectiveness, an experimental paradigm can be used, which involves participants attempting to reduce emotions that are induced using emotional stimuli, and reporting on their emotional experience. This approach has been used in many studies in the field (Goldin et al., 2008; Gross, 1998a; Gross & Levenson, 1997; McRae et al., 2012b; Richards & Gross, 2000; Sheppes & Meiran, 2007; Sheppes et al., 2014; Sullivan & Kahn, 2020). The change in levels of emotion after using the strategy provides an indication of how successfully the individual used the ER strategy, which is their ER effectiveness. Now that the findings of Study 1 have demonstrated there are emotion-specific gender differences in the reporting of some ER strategies, and these can vary across specific emotions, it is important to investigate whether there are emotion-specific gender differences in ER effectiveness.

In addition, an important next step for this research is to examine the potential relationship these gender differences may have with factors which are known to be related to ER, such as mental health. There are gender differences in variables associated with mental

health, such as depression (H. Chen et al., 2019; Girgus & Yang, 2015), and self-harm regardless of the intention (Hawton et al., 2012; Knudson et al., 2020; Madge et al., 2008; O'Connor et al., 2009). Further, ER is associated with these variables (T. S. Davis et al., 2014; Garnefski & Kraaij, 2006; Polanco-Roman et al., 2015). Therefore, it is possible that ER may play a role in gender differences in mental health problems. No research to date has investigated these relationships in an emotion-specific manner. Investigating gender differences in the effectiveness of regulating sadness, anger, and fear, and examining the relationship between emotion-specific ER and gender differences in variables associated with mental health will be addressed in Study 2, which is reported in Chapter 5 (Study 2a) and Chapter 6 (Study 2b).

#### **4.6. Conclusion and Next Steps**

The aims of Study 1 were (1) to measure the key strategies used to regulate specific emotions and test whether these varied across emotions, (2) to examine gender differences in the reporting of ER to regulate sadness, anger, and fear, and (3) to test whether emotion-specific gender differences exist in the use of engagement, disengagement, and distraction.

There was partial support for the hypotheses of the present study. Gender differences in the reporting of some ER strategies emerged, but this depended on (1) the specific emotion being regulated, (2) the age group being examined, and (3) the ER strategy. Of note, gender differences emerged in the reporting of social support, listening to music, venting/expressing emotion, and reappraisal. Importantly, gender differences in reappraisal emerged for fear, but not for sadness or anger, which demonstrates that gender differences in the use of reappraisal are indeed emotion-specific. This finding brings clarity to a literature which has been plagued with mixed findings. Support for the engagement hypothesis was limited.

The most important message to take away from this study is that what is known about the regulation of one specific emotion cannot necessarily be applied to all emotions. The reporting of some ER strategies, and gender differences in the reporting of some ER strategies, differed according to the specific emotion. This variation in the use of ER indicates that specific emotions are regulated in different ways, and gender interacts with the specific emotion. The findings of the present study highlight the importance of moving towards a discrete emotions framework by conducting future ER research, particularly around gender differences, in an emotion-specific manner.

The methodological approach in the present study allowed for the reporting of ER strategies to be assessed but does not measure the effectiveness of ER. As ER effectiveness is an important skill for many areas of life, and few previous studies in the literature have examined ER effectiveness in an emotion-specific manner, in Study 2, the effectiveness of regulating sadness, anger, and fear during an emotion regulation task will be examined.

Furthermore, it emerged in the present study that behavioural strategies, rather than cognitive strategies, were more commonly reported by participants. This is interesting, because the majority of strategies that are investigated in the field of ER are cognitive strategies, such as reappraisal, suppression, distraction, and rumination. It is possible that participants may be less able to report on these cognitive strategies. As cognitive strategies have been highlighted as being important in the field, these will be examined in Study 2. The first part of Study 2 (Study 2a) will be reported in Chapter 5.

#### KEY POINTS FOR CHAPTER 4

1. The aims of Study 1 were (1) to measure the key strategies used to regulate specific emotions and test whether these varied across emotions, (2) to examine gender differences in the reporting of ER to regulate sadness, anger, and fear, and (3) to test whether emotion-specific gender differences exist in the use of engagement, disengagement, and distraction
2. The reporting of ER strategies often varied across emotions, and gender differences in the reporting of some (but not all) ER strategies were emotion-specific.
3. There was some evidence to suggest females are more likely than males to use engagement ER.
4. This research demonstrates the importance of examining ER in an emotion-specific manner, and highlights the methodological approach used in this study as a valuable measure of emotion-specific ER for future research.

#### QUESTIONS FOR SUBSEQUENT CHAPTERS

1. Are there gender differences in how effectively individuals can regulate sadness, anger, and fear? (Chapter 5)
2. Are gender differences in the regulation of sadness, anger, and fear related to gender differences in variables associated with mental health? (Chapter 6)

#### NEXT STEPS

Study 1 demonstrated that there are gender differences in the reporting of some ER strategies. However, this does not provide information about how effectively males and females use these ER strategies to regulate their specific emotions.

Study 2 is in two parts. The aim of Study 2a (Chapter 5) is to investigate if there are gender differences in the effective regulation of sadness, anger and fear, using two specific ER strategies – reappraisal and distraction – during an emotion regulation task. In Study 2b (Chapter 6), the relationships between gender, emotion-specific ER, and variables associated with mental health will be explored.

## **Chapter 5: Gender Differences in the Regulation of Sadness, Anger, and Fear during an Emotion Regulation Task (Study 2a)**

### **5.1. Chapter Summary**

The results of Study 1 demonstrated that the ER strategies people report using, and gender differences in the reporting of ER, often depend on the specific emotion. However, it remains unclear whether there are gender differences in how effectively individuals regulate specific emotions. This is important, because being able to effectively use an ER strategy is associated with several significant life outcomes. To date, no study has examined gender differences in ER by systematically comparing the effectiveness of ER strategies across specific emotions, which is the aim of the present study.

An emotion regulation task (ERT) was used to examine the regulation of sadness, anger, and fear. The ERT allows for ER to be measured in the moment and does not rely on participants having to recall previous ER strategies. Measuring ER in this way provides a different lens in understanding gender differences in emotion-specific ER.

Study 2 is split into two parts. The data for Study 2 were collected at one time-point, but two separate sets of analyses were conducted to test separate aims. In Study 2, emotion-general ER, depressive symptoms, self-harm behaviour, suicidal ideation, and wellbeing were measured using online self-report questionnaires, and the ERT was used to assess emotion-specific ER. In Study 2a (described in the present chapter), gender differences in the regulation of specific emotions using reappraisal and distraction were tested using analyses of variance (ANOVA). In Study 2b (reported in Chapter 6), mediation analyses were used to examine whether the regulation of specific emotions using reappraisal and distraction mediates the relationship between gender and self-harm behaviours, suicidal ideation and depressive symptoms. As exploring gender differences amongst the adult age group was limited in Study 1 due to a low sample size, adults were recruited in Study 2, and correlation analyses were conducted to examine if age was related to the study variables.

## **5.2. Introduction**

### ***5.2.1. Rationale for Study 2a***

As discussed in the preceding chapters, previous research has examined gender differences in ER in an emotion-general manner. An important objective of all empirical research is to test the robustness of evidence by examining whether the findings of previous studies can be replicated (Lamal, 1990). For example, testing whether prominent gender differences, such as males using suppression more than females to regulate general emotion (Gross & John, 2003; Spaapen et al., 2014; Zimmermann & Iwanski, 2014), are found in the sample of the present study. Therefore, the first aim of the current study is to test whether previous findings regarding gender differences in emotion-general reappraisal, distraction, suppression, and rumination can be replicated, using standard and commonly used self-report questionnaires from the literature.

The Study 1 method resulted in the ER strategies that participants were aware of using being recorded. However, as mentioned in Section 4.5.3, the strategies that were reported by participants were different from the strategies identified in the ER literature as being important. The lay view captured in Study 1 was that the majority of ER strategies were behavioural, such as seeking social support, sports/exercise, and listening to music. However, psychologists who study ER have proposed that cognitive strategies, such as reappraisal, suppression, distraction, and rumination are important strategies that people use frequently to regulate emotions in their daily lives (Aldao et al., 2010; Gross & John, 2003; Webb et al., 2012). Their views are based on empirical evidence that these cognitive strategies are important in ER (Gross, 1998a; Gross & John, 2003). On the basis of these experts' views, reappraisal, distraction, suppression, and rumination were chosen to examine in the present study in an emotion-general manner using questionnaires, and reappraisal and distraction were investigated in an emotion-specific manner experimentally. Although there is evidence



that these strategies are used by individuals to regulate their emotions (as measured by self-report questionnaires such as the ERQ), it remains unclear whether these strategies are used more so than others, such as the behavioural strategies that emerged in Study 1.

The Study 1 approach does not provide information about how effectively individuals regulate their emotions, and whether gender differences exist in ER effectiveness. This is an important aim for ER research, because ER effectiveness is associated with a number of outcomes, such as mental and physical health (Denny, 2020; Ford et al., 2017; Quinn & Joormann, 2020), quality of social relationships (E. A. Butler et al., 2003; Ivcevic & Eggers, 2021), positive behaviour in children (Kao et al., 2020), levels of self-control (Lawyer & Jenks, 2020), academic achievement (Ivcevic & Eggers, 2021), and positive work outcomes (Chandra et al., 2020).

A useful method for capturing ER effectiveness is by measuring the change in self-reported emotion levels after an individual uses an ER strategy during an emotion regulation task (ERT). The ERT has been used in many previous ER studies (Boland et al., 2019; Goldin et al., 2008; Gross, 1998a; Gross & Levenson, 1997). An individual's ability to regulate their emotions in the moment is measured during the ERT, and this method does not rely on the participant's ability to recall past ER strategies, or even to have an awareness of their ER processes. In the present study, the ERT will be adapted to measure the regulation of specific emotions, which may produce valuable and unique emotion-specific findings.

Two ER strategies which are commonly implemented during the ERT are reappraisal and distraction. These strategies were focused upon in the present research specifically because (1) there tend to be mixed findings regarding gender differences, and so including these in the present research offers an opportunity to find out if examining this in an emotion-specific manner brings clearer findings, (2) these are two of the most widely studied strategies in the literature and so findings can be related to the wider literature, (3) they are

both adaptive strategies associated with positive outcomes and so are beneficial for participants to implement in an experimental setting, and (4) both strategies have clinical relevance as they are associated with mental health variables.

Reappraisal and distraction tend to have mixed findings in the literature regarding gender differences in their use (Esmailinasaba et al., 2016; Garnefski et al., 2004; Nolen-Hoeksema & Aldao, 2011; Trives et al., 2016). A reason for these mixed findings may be that previous studies have failed to examine these strategies in an emotion-specific manner. When gender differences in the use of distraction to regulate a low mood (which is similar to sadness) was examined, clearer gender differences emerged (Trives et al., 2016). However, very few studies have examined gender differences in reappraisal or distraction in an emotion-specific manner.

Reappraisal and distraction have both been shown to effectively reduce negative emotion in an experimental setting (Gross, 1998a; Quinn & Joormann, 2020; Smoski et al., 2014). However, according to Gross's process model, which was described in Section 1.3.2.1, distraction is a more effective strategy than reappraisal for reducing negative emotion, as it intervenes earlier in the emotion generative process (Gross, 1998a). This has been supported with some empirical evidence (Sheppes et al., 2009; Sheppes & Meiran, 2007, 2008; Smoski et al., 2014; Thiruchselvam et al., 2011). Although this has been researched more generally, it remains unclear whether the effectiveness of these strategies differ according to the specific emotion being regulated. Research suggests that reappraisal is used to regulate low intensity emotions, whereas distraction is preferred for high intensity emotions (Sheppes et al., 2011). Sadness is often thought of as a low intensity emotion that is associated with reduced physiological activity (Lench et al., 2016). Based on this, it is possible that reappraisal may be more effective at reducing sadness, and distraction may be

more effective at reducing anger and fear. The second aim of this study is to investigate if the effectiveness of reappraisal and distraction depends on the specific emotion being regulated.

In any research examining gender and emotion, it is important to have an awareness of the cultural messaging around specific emotions, and how this may impact on ER processes. In relation to gender differences in ER, adhering to gender norms may influence the way that males and females regulate their specific emotions using reappraisal and distraction. There are many factors which influence the way people regulate their emotions. However, one of the factors which may contribute to gender differences in ER is the way that males and females are socialised to understand emotional behaviour.

When regulating emotions, people are motivated to avoid ‘gender inappropriate’ expressions of emotion (Timmers et al., 1998). Fear and sadness are often labelled as ‘feminine’ emotions, whereas anger is regarded as a ‘masculine’ emotion (L. R. Brody, 1985; Root & Denham, 2010), and so adherence to these gender norms may influence the way that males and females regulate their specific emotions. Males may be more motivated to avoid expressing sadness and fear (Timmers et al., 1998), whereas females may be more motivated to avoid expressing anger (Brescoll & Uhlmann, 2008). This is supported with evidence that shows that males are less likely than females to express sadness and fear (Chaplin, 2015; Chaplin & Aldao, 2013), whereas females are less likely to express anger, at least in certain contexts (Archer, 2004).

The motivation to avoid expressing these specific emotions may impact on the ER process, and may contribute to gender differences in the strategies used to regulate these particular emotions. Distraction is often used to regulate more intense emotions, whereas reappraisal is used to regulate lower intensity emotions (Sheppes et al., 2011; Van Bockstaele et al., 2019). As distraction appears earlier in the emotion generative process, this strategy may be used (rather than reappraisal) for emotions that are undesirable to experience or

express, by stopping the emotion before it gathers momentum. Reappraisal involves more engagement with the emotion, and so may be used to regulate more ‘acceptable’ emotions. Thus, males may be more likely to use distraction to regulate sadness and fear, as they are more highly motivated to avoid these emotions based on societal expectations, whereas females may be more likely to use reappraisal for sadness and fear, as there is less urgency to avoid expressing this emotion. There is less evidence for gender differences in anger (Grossman & Wood, 1993), and so no gender differences are expected in the regulation of anger. The third aim of the present study is to examine if there are emotion-specific gender differences in ER effectiveness.

### ***5.2.2. Research Questions for Study 2a***

On the basis of the literature reviewed in previous chapters, the following specific research questions (SRQs) were formulated for Study 2a.

- SRQ1. In line with the wider literature, can gender differences in the reported use of reappraisal, suppression, distraction, and rumination to regulate general emotion be replicated in the present study?
- SRQ2. Does the effectiveness of reappraisal and distraction depend on the specific emotion being regulated?
- SRQ3. Are there gender differences in the effectiveness of regulating sadness, anger, and fear using reappraisal and distraction, and do these gender differences vary according to the specific emotion and ER strategy?

### **5.3. Method**

In Study 2, participants took part in two sessions, which are detailed in Section 5.3.3. Participants firstly completed self-report questionnaires online, and then were invited to

participate in the ERT in person, approximately one week later. The details of these sessions are described in the following sections.

Please note that the data for Study 2 were split into two parts – Study 2a and Study 2b – to examine separate research questions. In Study 2a, data on reappraisal, suppression, rumination, and distraction were collected using self-report measures, and emotion-specific ER effectiveness was examined using the ERT. These measures will be described in this chapter. In Study 2b, self-report measures were used to collect data on depressive symptoms, psychological wellbeing, self-harm behaviours, and suicidal ideation; however, these measures are not discussed here, but are reported in Chapter 6.

### **5.3.1. Participants**

The participants for Study 2 were recruited from three key sources – (1) the undergraduate and postgraduate student communities at the University of Strathclyde in Glasgow, (2) government analysts from the Scottish Government, and (3) the wider community. The reason for government analysts taking part in the study was because the researcher worked at the Scottish Government during the data collection period and so this organisation represented an important source of participants for the present study. Two hundred and sixty-five participants took part in the online session, and of these participants, 77% also participated in the experimental session, leaving a final sample of 203 participants (104 males and 99 females) who completed the study in its entirety. The age of participants ranged from 17 – 72 years old, and the mean age of the sample was 25.60 ( $SD = 9.63$ ).

Of the participants who completed both parts of the study, 82% were students, 15% were government analysts, and 3% were from the wider community. The participants in the study were highly educated, with 57% of the sample having completed university, 6% having completed an intermediate qualification between secondary level and university (such as technical training), and 36% of the sample having completed secondary education (which

reflects the fact that many of the participants were undergraduate students at the time of participation). In terms of ethnic background, 89% of the sample were White, 6% were of Mixed ethnic background, and 5% were Asian, Black, or belonged to an 'Other' ethnic group (these categories were combined due to low numbers in these groups).

The inclusion criteria for Study 2 were that participants (1) must identify as either male or female, and (2) must be able to read and write in English. The exclusion criterion was that participants must not have a clinical diagnosis of depression. A key aim of the present research was to examine gender differences in emotion-specific ER, and so it was important to have well-defined gender categories. Further, participants were required to speak English to ensure that all participants had a clear understanding of the task. Often there are marked differences in ER between individuals with and without a clinical diagnosis of depression (Kanske et al., 2012; Kjaerstad et al., 2016). Therefore, in order to control for any effects that a clinical diagnosis of depression would have on the results, and to decrease the heterogeneity in the sample, only individuals without a diagnosis of depression took part in the study.

### **5.3.2. Materials**

**5.3.2.1. Session 1: Self-Report Measures.** Participants completed the self-report measures online, on the survey platform Qualtrics. The measures included in the present study were the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) to measure reappraisal and suppression, the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) to measure rumination, the brief COPE scale (Carver, 1997) to measure distraction, the Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) to measure depressive symptoms, the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007) to measure wellbeing, the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) to measure self-harm behaviours, and the Suicidal Ideation Attributes

Scale (SIDAS; van Spijker et al., 2014) to measure suicidal ideation. The questionnaires that were used to measure variables associated with mental health (CES-D, WEMWBS, DSHI, SIDAS) are not discussed here, but are reported in Section 6.3.1.

**5.3.2.1.1. Demographic Information.** Participants were asked questions to collect data on their demographic information during the online session. Age was measured using the question ‘How old are you (Please type your answer into the box)’. Sex and gender were measured using the questions ‘What is your sex? (Please type your answer into the box)’ and ‘What gender do you identify as? (Please type your answer into the box)’. All participants reported their gender as being consistent with their biological sex. Gender was measured on a male/female binary, and this variable was used to examine gender differences in the present research by comparing the data for males and females. Ethnic background was measured based on the guidelines provided by the Office for National Statistics (2021) for measuring ethnic groups in the UK. Educational attainment was measured by asking the question ‘What is the highest level of education you have completed? University or College or Equivalent, Intermediate between Secondary Level and University (e.g., Technical Training), Secondary School, Primary School only or less’, as this can provide an indication of the socio-economic distribution of the sample. Finally, to determine the proportion of students in the sample, participants were asked ‘Are you currently a student? Yes, No’.

**5.3.2.1.2. Measures of Emotion Regulation.** Although the main measure of ER was the regulation of specific emotions during the ERT, some standardised questionnaires which measure the habitual regulation of general emotion were included to assess if the present study replicated previous findings in the field. The ERQ, RRS, and brief COPE were used to measure emotion-general ER in the present study.

*Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003). The ERQ is a 10-item scale which measures individual differences in the habitual use of two ER strategies to

regulate general positive and negative emotion – cognitive reappraisal and expressive suppression. The ERQ measures the frequency with which participants use these strategies in their daily life by recording the extent to which participants agree with a number of statements on a 7-point Likert scale which ranges from 1 (strongly disagree) to 7 (strongly agree). An example of an item on the ERQ is ‘When I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about’. The ERQ is a leading measure of ER and has demonstrated robust psychometric properties. The ERQ has high internal consistency, with alphas ranging from  $\alpha = .75$  to  $.82$  for the reappraisal scale, and from  $\alpha = .68$  –  $.76$  for the suppression scale across samples (Gross & John, 2003). In the present study, the Cronbach’s alphas were  $\alpha = .84$  for reappraisal and  $\alpha = .74$  for suppression, which demonstrates acceptable levels of reliability (DeVellis, 2016). The ERQ also shows strong convergent and discriminant validity (Gross & John, 2003).

*Ruminative Response Scale* (Nolen-Hoeksema & Morrow, 1991). The RRS is a 22-item scale which measures the tendency to use rumination as a way of responding to a depressed mood. The RRS measures the extent to which participants agree with a number of statements describing how people respond when they are feeling sad or depressed. An example of an item from the RRS is ‘I won’t be able to do my job if I don’t snap out of this’, and this is measured on a 4-point Likert scale ranging from 1 (almost never) to 4 (almost always).

The RRS has been extensively used in depression research and has led to many insightful findings regarding the relationship between depression and rumination. The RRS has demonstrated high internal consistency, with Cronbach’s  $\alpha$  ranging from  $.88$  to  $.92$  (Bagby et al., 1999; Just & Alloy, 1997; S. A. Nolan et al., 1998; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema et al., 1999; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1994), and test-retest reliability ( $r = .75$ ) across 18 months is high (Nolen-Hoeksema &



Davis, 1999). In the present study, the rumination scale had a Cronbach's alpha of  $\alpha = .90$  which demonstrates excellent internal consistency (DeVellis, 2016).

*Brief COPE* (Carver, 1997). The brief COPE is an abbreviated 28-item version of the COPE inventory (Carver et al., 1989), which measures the different ways that people cope in response to stress, including active coping, denial, and substance use. Participants indicate the extent to which they agree with statements such as 'I've been using alcohol or drugs to make myself feel better' on a 4-point Likert scale which ranges from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot). The subscale of interest in the present study was the distraction subscale, which measures the tendency to use distraction as a coping strategy. The full brief COPE scale was administered to ensure that no response bias was introduced by presenting the distraction subscale alone. The distraction subscale has been found to have good internal consistency (Cronbach's  $\alpha = .71$ ) in previous research (Carver, 1997).

However, in the present study, the internal consistency of the distraction subscale was poor,  $\alpha = .41$ , as generally an alpha of .70 or over is regarded as acceptable (Clark & Watson, 2016; DeVellis, 2016). As the subscale showed poor reliability, it was not included in the analysis.

**5.3.2.2. Session 2: Emotion Regulation Task (ERT).** ER was measured in the present study using the emotion regulation task (ERT), which is a commonly used method in ER research (e.g., Goldin et al., 2008; Gross, 1998; Gross & Levenson, 1997). The ERT allows for ER effectiveness to be assessed by measuring self-reported levels of emotion during the task. The task was developed for the present study using the E-Studio component of E-Prime application suit, a world-leading software application for developing behavioural experiments.

**5.3.2.2.1. Task Procedure.** In the ERT, participants were shown emotion-eliciting pictures. These pictures were selected with the aim of inducing three specific emotions –

sadness, anger or fear. The procedure for choosing these pictures was described in Section 3.5.2.2.

There were three conditions in the ERT – the no regulation condition, the reappraisal condition, and the distraction condition. In the no regulation condition, participants viewed the emotional picture without any instructions to use ER (i.e., look at the image as you normally would). In the reappraisal condition, participants were instructed to use reappraisal in response to the picture (i.e., change the meaning of the situation in the picture). In the distraction condition, participants were asked to use distraction in response to the picture (i.e., think about something unrelated). Immediately after viewing each picture, the participants were asked to rate their levels of sadness, anger, and fear on three independent 9-point Likert scales. These Likert scales represented the level of subjective experience for each specific emotion, and were used to calculate the ER effectiveness scores, which is described in more detail in Section 5.3.2.2.2 below.

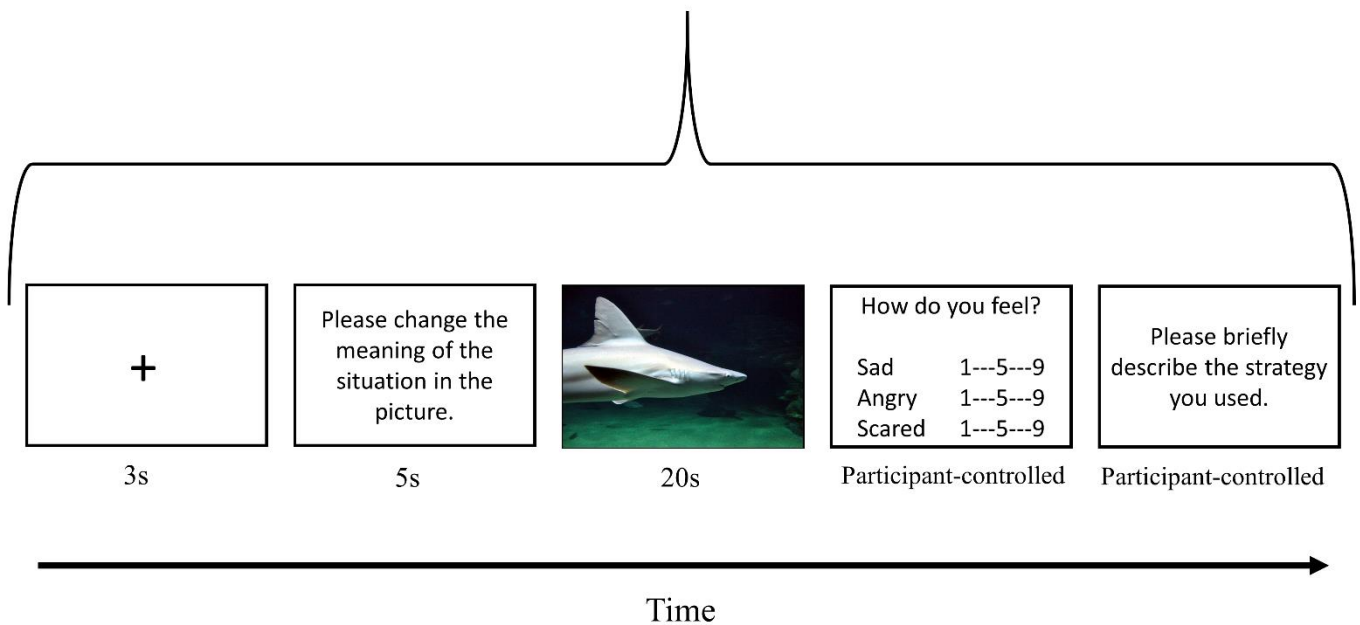
Each picture in the ERT had a target emotion and was chosen with the aim of eliciting that target emotion within the participant. The ERT consisted of 27 trials, of which 9 were sadness trials, 9 were anger trials, and 9 were fear trials. As the experiment used a within-subjects design, each participant took part in all of the conditions of the experiment. The number of trials in the ERT were chosen with the aim of maximising the number of trials for each condition, while balancing this with reducing participant fatigue, and this is similar to the number of trials used in previous studies (e.g., Goldin et al., 2008; Gross, 1998; Gross & Levenson, 1997). Each trial consisted of 5 screens, as depicted in Figure 5.1. The participant was presented with a fixation point to focus their attention onto the screen, which appeared for 3 seconds. The instruction screen then appeared for 5 seconds, followed by the emotional picture, which appeared for 20 seconds.

The next screen allowed the participant to self-report their levels of sadness, anger, and fear. The timing of this screen was participant-controlled, which meant that the participant pressed a button to move on to the next screen when they were ready. A final screen appeared asking the participant to briefly describe the regulation strategy they used during the trial. The purpose of this stage was to gather evidence that the participant made a genuine attempt to implement the regulation strategy during the task. All participants described their ER strategies sufficiently at this stage, which indicates that all of the participants were engaged with the task. Sufficient engagement with the task was demonstrated by a detailed and relevant description of how the strategy was implemented, which all participants provided. The participant then pressed a button to move on when they were ready to begin the next trial. The trials appeared in a randomised order for each participant to avoid any order effects. Although trials appeared in a random order, each instruction (i.e., no regulation, reappraisal, or distraction) appeared with the same picture for

**Figure 5.1**

*Stages of the Emotion Regulation Task*

This represents one trial in the ERT. Each trial was presented in a randomised order.



every participant. In other words, the instructions were tied to the same pictures for all participants. The ERT took around 30 minutes to complete.

**5.3.2.2.2. *Emotion Regulation Effectiveness.*** Levels of emotion (i.e., subjective experience) were recorded during the ERT using three independent 9-point Likert scales for sadness, anger, and fear. The Likert scales ranged from 1 (not at all sad/angry/scared) to 9 (extremely sad/angry/scared). This means that a lower score reflects feeling less emotion, and a higher score represents higher levels of emotion. ER effectiveness scores were computed using these self-reported emotion levels, which is a method that has been used with success in several studies (Goldin et al., 2008; Gross, 1998a; Gross & Levenson, 1997; Sheppes & Meiran, 2007; Sullivan & Kahn, 2020).

On trials during which participants were instructed to look at the image as they usually would (no regulation condition), the level of emotion reported after viewing the emotional picture was regarded as the level of emotion participants experience when they are not instructed to use ER. On trials during which participants were instructed to use reappraisal or distraction (the regulation conditions), it is assumed that the level of emotion reflects the use of this ER strategy. Thus, the difference in self-reported levels of emotion between the no regulation and regulation trials was a measure of how well participants used the ER strategies to regulate their emotions, which is known as ER effectiveness in the present study. ER was calculated using the following formula:

Level of emotion in the no regulation condition – level of emotion in the regulation condition = ER effectiveness. This means that a higher score represents higher ER effectiveness (i.e., a larger reduction in emotion).

**5.3.2.2.3. *Task Instructions.*** The following instructions appeared at the beginning of the experiment:

‘Thank you for taking part in this study. In this experiment, you will be shown pictures, and you will be asked to use two different strategies to try to change how you interact with these pictures.

One of these strategies involves changing the meaning of the situation in the picture so that you see it as more positive or neutral. So, for example, if the picture shows an individual who seems upset, you might tell yourself that it will all work out for the best or that it’s not a big deal.

The other strategy involves thinking of something else in order to divert your attention away from whatever is happening in the picture. So, if something upsetting is happening in the picture, you will try to think about something different.

At the end of each trial, you will be asked to report how sad, angry and scared you feel on a 9-point scale. It is important that you report how you actually feel, not how you think you should feel. Please try to give an honest account of how you feel during the experiment. Please let the researcher know if you have any questions before continuing.’

The specific instructions that were presented before each trial were as follows. For the no regulation trials, participants were instructed to ‘Please look at the picture as you normally would’. For the reappraisal trials, participants were instructed to ‘Please change the meaning of the situation in the picture’. For the distraction trials, participants were instructed to ‘Please think of something unrelated to what is happening in the picture’.

**5.3.2.2.4. Emotional Stimuli.** Using images as emotional stimuli has been shown to be the most effective elicitor of discrete emotions (Lench et al., 2011). As described in Section 3.5.2.2, emotional images were carefully chosen based on normative values of emotion levels elicited by the pictures (Mikels et al., 2005; Riegel et al., 2016) with the aim of inducing the specific emotions of sadness, anger, and fear. The following images from the

IAPS (Lang et al., 1993) were used in the ERT: 6313, 6360, 6550, 6540, and the following images from the NAPS (Marchewka et al., 2014) were used in the ERT: People\_127\_h, People\_075\_v, Faces\_032\_h, Landscapes\_139\_h, Landscapes\_026\_h, Faces\_031\_v, People\_226\_h, People\_040\_h, Faces\_283\_h, People\_003\_h, People\_122\_h, Animals\_053\_h, Animals\_013\_h, Animals\_060\_h, Animals\_076\_v, Animals\_011\_h, Animals\_030\_h, Animals\_006\_v, Animals\_007\_h, Animals\_004\_v, Animals\_055\_h, Animals\_022\_h, Animals\_144\_h. The mean self-reported levels of each specific emotion induced by these images during the task are reported in Section 5.4.4.1.

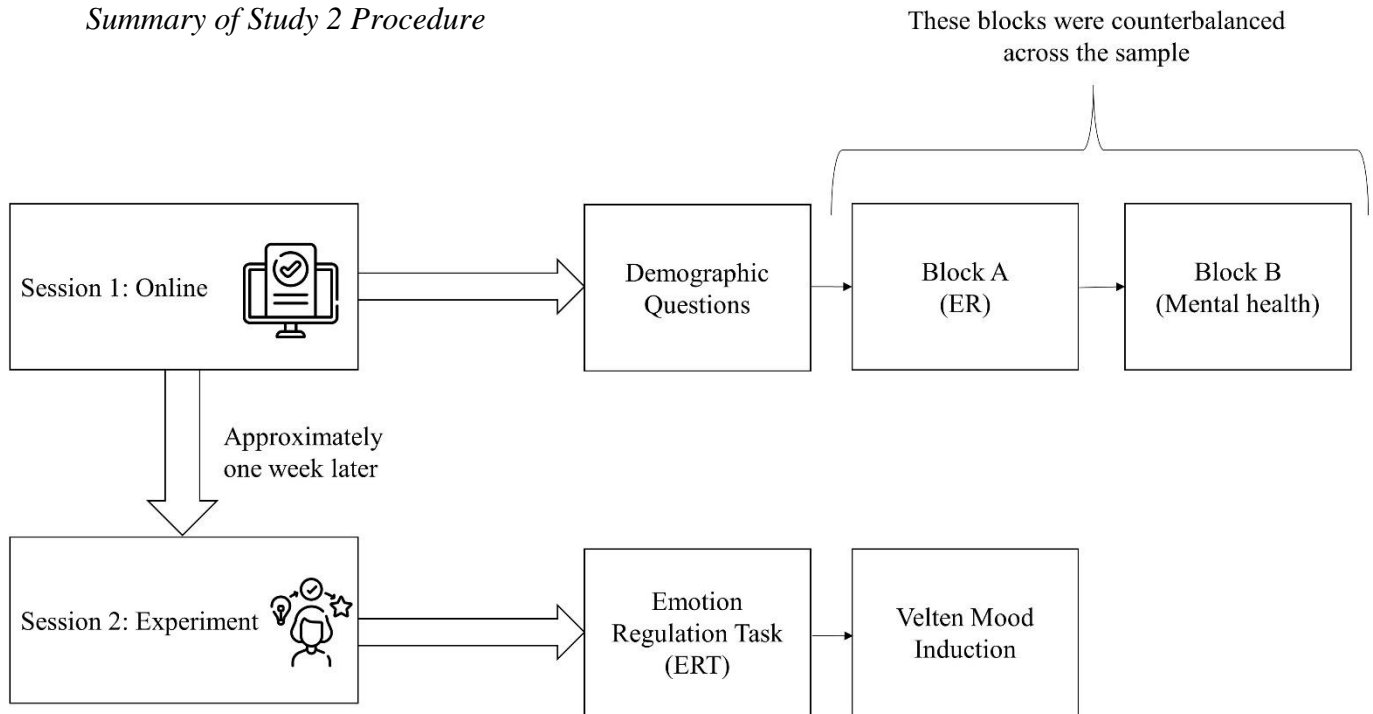
### **5.3.3. Procedure**

Ethical approval for this study was obtained from the University of Strathclyde Ethics Committee (reference number: UEC17/58), and all participants provided informed consent before taking part. There were two parts to the present study – an online session during which self-report data on ER and variables associated with mental health were collected, and an experimental session which took place in person, during which participants completed the ERT. The data were collected confidentially, and participant information was kept physically under lock and key, and digitally on an encrypted drive. The procedure for Study 2 is summarised in Figure 5.2.

**5.3.3.1. Session 1: Online.** The online session took place on the survey platform Qualtrics. Participants firstly read an information sheet (Appendix I) before deciding whether or not to take part. All participants provided informed consent by signing a consent form (Appendix J). If participants wished to take part, they provided information regarding their age, sex, gender, ethnic background, educational background, and student status (Appendix K), and then completed self-report measures of ER (Appendix L), variables associated with mental health (Appendix M), and a measure of gender roles and social desirability (which

**Figure 5.2**

*Summary of Study 2 Procedure*



were not included in the final analysis) (Appendix N). The measures were presented in two blocks, which were counterbalanced across the sample to reduce any bias that could be introduced into the data due to participant fatigue.

The measures in block A were presented in the following order – ERQ, RRS, brief COPE, and for block B – WEMWBS, CES-D, DSHI, SIDAS, and MCSDS, and the measures were always presented in the same order within each block. The gender roles and social desirability questions were administered after the self-harm and suicidal ideation scales, as these have a neutral focus and may help to distract from any negative mood induced when answering the self-harm and suicidal ideation questions. On completion of the measures, the participant was invited to provide their name and email address if they wished to take part in the next stage of the study, and participants were thanked for their time.

**5.3.3.2. Session 2: Experiment.** The second part of the study took place approximately one week later. On arrival at the laboratory, participants received an information sheet which contained details about what was entailed during the ERT. If the

participant wished to proceed, they were asked to sign a consent form. The participant then completed the ERT, which is described in Section 5.3.2.2. Following the task, participants completed a Velten (1968) positive mood induction procedure (Appendix O), which involved reading positively worded sentences. The aim of this procedure was to reverse any negative affect induced by the ERT and it has been shown to be effective in increasing positive affect (Teasdale & Russell, 1983). Following this, participants were provided with a debriefing sheet (Appendix P), which contained additional details about the study, contact details for the investigators, and sources of support if required.

#### **5.3.4. Analysis**

##### **5.3.4.1. Approach for Testing Gender Differences in Emotion-General ER**

**(SRQ1).** In the present study, it was hypothesised that there would be gender differences in the self-reporting of rumination, suppression, and distraction, and there would be no gender differences in reappraisal. However, as distraction did not demonstrate an adequate level of internal consistency (reported in Section 5.3.2.1), it was excluded from the analysis. Gender differences in the reporting of emotion-general reappraisal, suppression and rumination were tested using independent *t*-tests, which is reported in Section 5.4.3. Independent *t*-tests were chosen because these demonstrate if there is a significant difference between the mean levels of strategy use between males and females, and so is a good indicator of gender differences in ER.

**5.3.4.2. Approach for Testing Whether the Effectiveness of ER Depends on the Specific Emotion Being Regulated (SRQ2).** In the ERT, self-reported levels of sadness, anger, and fear were measured in a no regulation condition, a reappraisal condition, and a distraction condition. ER effectiveness scores were computed as the difference between self-reported emotion in the no regulation condition, and the regulation conditions, which



represent the ability to reduce emotions using these ER strategies. Three 2 x 2 mixed ANOVAs were used to test for gender differences in ER effectiveness, which are reported in Section 5.4.5 below. Each ANOVA was used to test a specific emotion – sadness, anger, or fear. The independent variables were Gender (Male, Female), and ER Strategy (Reappraisal, Distraction), the dependent variable was the change in emotion (sadness/anger/fear), or ER effectiveness. The effectiveness of reappraisal and distraction were tested by examining the main effects of the ANOVAs.

#### **5.3.4.3. Approach for Testing. Gender Differences in the Regulation of Sadness, Anger, and Fear (SRQ3).**

Gender differences would be demonstrated by finding a main effect of gender (which shows that one group have a larger change in emotion, regardless of the strategy used), or a gender by ER strategy interaction (which demonstrates that one group were more effective at reducing emotions using a certain strategy). If a significant interaction is found, this will be followed up with simple main effects (adjusted for multiple comparisons) to examine where the significant differences lie.

To explore whether these gender differences vary across specific emotions, the results across all the ANOVAs must be examined, because each ANOVA is conducted on a specific emotion. It is expected that the direction of the results may differ across each of the emotions, or some findings may be significant for one emotion but not for others. For example, females may be more effective than males at reducing sadness using reappraisal, but this gender difference may not be found for anger.

## 5.4. Results

### 5.4.1. Data Screening and Assumptions

**5.4.1.1. Missing Data.** Two cases (less than 1% of the total sample) were missing emotional data due to computer error in the ERT during data collection. Listwise deletion was used for cases with missing data, which involves excluding cases with any missing data from the analysis, and results in all statistics being computed from the same complete sample of data. This is the standard method used in ANOVA and is appropriate when there are no patterns in the missing data and removing cases results in no (or little) loss of power (Sweet & Grace-Martin, 2011), which was the case in the present study.

**5.4.1.2. Outliers.** When performing an analysis on grouped data, such as ANOVA, outliers are identified separately within each group (Tabachnick & Fidell, 2014), and so males and females were screened independently for outliers. The data were tested for univariate outliers (i.e., cases which have unusually high scores on one variable) using standardised z-scores, with z-scores over 3.29 being regarded as an outlier (Tabachnick & Fidell, 2014). Six univariate outliers were found in total. One univariate outlier was found for change in sadness using distraction (male), and there was one univariate outlier for change in anger using reappraisal (male). Two outliers were found for the change in fear using distraction (one male, one female). Two outliers were also found for the change in fear using reappraisal (both female), and one for the change in fear using distraction (female). All the univariate outliers, except the outliers for the change in fear using distraction, were caused by an unusually large reduction in emotion. The outlier for the change in fear using distraction was caused by an unusually large increase in emotion.

The data were also checked for multivariate outliers (i.e., cases which have an unusual pattern across the repeated measures variables) using Mahalanobis distance, Cook's values and Leverage values. The ER effectiveness variables (sadness reappraisal effectiveness,

sadness distraction effectiveness, anger reappraisal effectiveness, anger distraction effectiveness, fear reappraisal effectiveness, fear distraction effectiveness) were tested for outliers. Any cases which had unusual values for two out of the three of these criteria (Mahalanobis distance, Cook's values or Leverage values) were regarded as a multivariate outlier and were omitted from the analysis (Tabachnick & Fidell, 2014). Four multivariate outliers (all female) were found for the sadness variables. For the anger variables, 5 multivariate outliers were identified (2 male, 3 female), and 9 were found in the fear variables (2 male, 7 female). The removal of outliers did not impact on the significance of the results.

**5.4.1.3. Normality and Linearity.** The normality and linearity of residuals were assessed through visual inspection of normal PP-plots and a histogram of standardised residuals. The residuals for the sadness data were normally distributed. However, there was evidence of slight positive skew in the anger and fear data. Some positive skew is to be expected due to the nature of psychological variables, as there is often a pile up of lower scores (Cain et al., 2017). In terms of linearity, inspection of the plots showed that each of the variables appeared to be linearly related.

Non-normal data are only problematic when there is severe skewness and the sample size is small (Hayes, 2017), which was not the case in this study. Three options for analysis were explored – (1) using a standard parametric ANOVA, (2) using a robust ANOVA, and (3) transforming the data using square root transformation. All three approaches produced similar results, with no difference in the significance or direction of the results between these approaches. As the robust ANOVA results in loss of cases, and the transformation of the data impacts the interpretation of the findings, the results from the standard ANOVA are reported.

**5.4.1.4. Homoscedasticity.** An assumption of ANOVA is that the error variances (i.e., residuals) in each group should be equal, which is known as homoscedasticity (Field, 2017). Homoscedasticity was tested in two ways: (1) by plotting the standardised residuals

against the standardised predicted values for each model, and (2) by conducting Levene's test of equality of error variances. Visual inspection of the scatterplots suggested no evidence of heteroscedasticity in the anger or fear data. Further, Levene's test was non-significant for the anger and fear variables.

There was some evidence of heteroscedasticity in the sadness data, with Levene's test being significant for the change in sadness using reappraisal ( $p = .01$ ) and the change in sadness using distraction ( $p = .01$ ). However, ANOVA is reasonably robust to violations of this assumption, provided that group sizes are approximately equal (Stevens, 2012), which is the case in the present study.

**5.4.1.5. Multicollinearity.** Multicollinearity refers to perfect or near-perfect correlation between variables (e.g.,  $r = .99$ ), which can prevent multivariate analyses from running correctly (Tabachnick & Fidell, 2014). A correlation analysis between each of the within-subjects variables was conducted to test for multicollinearity for each ANOVA model. None of the variables exhibited perfect (or near-perfect) correlation, with the highest correlation between variables being  $r = .67$ , and so there was no evidence of multicollinearity in the data.

**5.4.1.6. Power.** Statistical power is the ability of a test to find an effect if one exists (Field, 2017). An a priori power analysis was conducted using the software G\*Power Version 3.1.9.2 (Faul et al., 2007) to determine the sample size required for the ANOVA to be adequately powered. This analysis found that a sample size of  $n = 70$  was required for the ANOVA to find a small to medium effect size at 0.80 power. Therefore, this analysis is sufficiently powered to find an effect if one exists.

#### ***5.4.2. Sample Characteristics: Comparing the Student Participants to the Rest of the Sample***

As noted in Section 5.3.1, the sample in the present study mostly consisted of students (82%) as well as government analysts (15%) and members of the community (3%). Analyses were run on the key study variables to determine if there were differences between the student participants and the rest of the sample (i.e., the government analysts and community members). As shown in Table 5.1, the student group were younger and had a lower percentage of females than the rest of the sample. There were no differences between the students and the rest of the sample relating to ER effectiveness, emotion-general reappraisal, or suppression. However, students had a higher level of rumination than the rest of the sample. Similar analyses were run on the variables associated with mental health for Study 2b and these results are reported in Section 6.4.2.5.

#### ***5.4.3. Emotion-General ER: Gender Differences in ER as Measured by Self-Report Questionnaires***

Habitual, emotion-general ER was measured using standardised measures, to assess if the sample demonstrated gender differences in ER which reflect patterns found in the wider literature. Gender differences in the use of reappraisal, suppression, and rumination were tested using independent *t*-tests.

**Table 5.1**

*T-Tests and Chi-Square Analyses Comparing Student Scores on Key Variables With Rest of the Sample*

Variable	Students		Rest of sample		<i>t</i>	<i>p</i>
	M	SD	M	SD		
Age	23.45	8.31	35.27	9.27	<b>-7.14</b>	<b>&lt; .001</b>
Reappraisal Sadness	-.04	.89	.16	1.01	-1.24	.22
Distraction Sadness	.52	.95	.77	.97	-1.44	.15
Reappraisal Anger	1.00	.94	1.10	1.06	-.57	.57
Distraction Anger	1.26	1.01	1.22	.96	.18	.85
Reappraisal Fear	.21	.77	.20	.72	.07	.95
Distraction Fear	.09	.76	.05	.84	.23	.82
Reappraisal (emotion-general)	4.64	1.24	4.90	1.07	-1.16	.25
Suppression (emotion-general)	3.74	1.32	3.42	1.24	1.34	.18
Rumination (emotion-general)	47.27	12.09	42.59	10.03	<b>2.19</b>	<b>.03</b>
Social desirability	6.78	2.72	6.68	2.86	.22	.42
	<b>% M</b>	<b>% F</b>	<b>% M</b>	<b>% F</b>	<b><math>\chi^2</math></b>	<b><i>p</i></b>
Gender	54.82	45.18	35.14	64.86	<b>4.69</b>	<b>.03</b>

*Note.* Significant values at  $p < .05$  are shown in bold. All tests are two-tailed. *t* refers to the *t*-value,  $\chi^2$  is the chi-square value, and *p* is the *p*-value, % M is the percentage of Males, % F is the percentage of Females.

As shown in Table 5.2, there were no gender differences in emotion-general reappraisal or rumination. However, there were gender differences in the use of suppression, with males reporting significantly higher levels of suppression than females.

**Table 5.2**

*Means (M) And Standard Deviations (SD) Of Habitual ER Reported by Males and Females*

ER Strategy	Males		Females		Total		<i>p</i> value
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Reappraisal	4.53	1.24	4.86	1.17	4.69	1.21	.06
<b>Suppression</b>	<b>4.14</b>	<b>1.20</b>	<b>3.19</b>	<b>1.25</b>	<b>3.68</b>	<b>1.31</b>	<b>&lt;.001</b>
Rumination	46.73	12.25	46.08	11.48	46.41	11.86	.70

*Note.* Significant differences shown in bold.

#### 5.4.4. Emotion Regulation Task (ERT)

**5.4.4.1. Emotion Manipulation Check in the ERT.** A challenge in all emotion research is successfully inducing the intended emotion during an experiment. To determine if the emotion manipulation in the ERT was successful, the mean emotion scores in the no regulation condition were observed for each target emotion. As shown in Table 5.3, each target emotion elicited the corresponding self-reported emotion more highly than the other two emotions, which demonstrates that the emotional pictures induced the target emotion as intended. One-way analyses of variance confirmed that the emotional stimuli induced the target emotion more highly than the other emotions.

It should be noted that each target emotion also induced the other emotions at a lower level, which indicates that emotional pictures tend to produce mixed emotions in an experimental setting. However, only the self-reported levels of emotion consistent with the target emotion were included in the main analyses.

**Table 5.3**

*Means (M) And Standard Deviations (SD) Of Self-Reported Levels of Emotion During the No Regulation Condition of the ERT*

Target emotion	Level of Sadness		Level of Anger		Level of Fear		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Sadness	<b>4.98</b>	2.21	3.01	2.59	1.10	1.82	<.001
Anger	3.44	2.45	<b>4.69</b>	2.45	1.14	1.86	<.001
Fear	.62	1.29	.49	1.18	<b>1.94</b>	2.28	<=.002

*Note.* The highest mean values appear in bold.

**5.4.4.2. Descriptive Statistics: Self-Reported Levels of Emotion During the ERT and Computed ER Effectiveness Scores.** The mean levels of emotion reported by males and females in each condition of the ERT are shown in Table 5.4. Independent *t*-tests were conducted to test for gender differences in levels of sadness, anger, and fear in the no regulation condition. These *t*-tests indicated that females had higher self-reported levels of

**Table 5.4**

*Means (M) And Standard Deviations (SD) Of Self-Reported Emotion Levels in the ERT for Males and Females*

	Males		Females	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sadness – no regulation	2.80	1.35	3.24	1.37
Sadness - reappraisal	2.89	1.35	3.15	1.50
Sadness - distraction	2.49	1.33	2.41	1.32
Anger – no regulation	2.61	1.42	2.87	1.36
Anger - reappraisal	1.61	1.31	1.82	1.43
Anger - distraction	1.58	1.23	1.38	1.10
Fear – no regulation	1.20	1.11	1.60	1.40
Fear - reappraisal	1.14	1.15	1.24	1.30
Fear – distraction	1.31	1.28	1.32	1.27

sadness,  $t(199) = -2.27, p = .02$ , and fear,  $t(183.35) = -2.21, p = .03$ , than males in the no regulation condition. There were no gender differences in self-reported anger in the no regulation condition,  $t(199) = -1.32, p = .19$ .

For each ER strategy, *t*-tests were conducted to determine if the strategy reduced emotion levels as expected during the ERT. The results are shown in Table 5.5. As expected, distraction reduced sadness and anger, and reappraisal reduced anger and fear. However, reappraisal did not reduce sadness, and distraction did not reduce fear during the task.

ER effectiveness variables were computed from these scores, by subtracting the mean level of emotion in the regulation (reappraisal or distraction) condition from the mean level of emotion from the no regulation condition. This means that a higher score indicates higher ER effectiveness (i.e., a greater reduction in emotion). This resulted in six ER effectiveness variables – reappraisal effectiveness for sadness, distraction effectiveness for sadness, reappraisal effectiveness for anger, distraction effectiveness for anger, reappraisal effectiveness for fear, and distraction effectiveness for fear. The means and standard



deviations of these variables are shown in Table 5.6. These variables were included in the main analysis.

**Table 5.5**

*Results of T-Tests Showing Difference in Emotion Levels Between No Regulation Condition and Regulation Condition*

<b>Condition</b>	<b>No regulation</b>		<b>Reappraisal</b>		<b>Distraction</b>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sadness	3.01	1.37	3.02	1.43	2.45	1.32
Anger	2.73	1.39	1.71	1.37	1.48	1.17
Fear	1.39	1.27	1.19	1.22	1.31	1.27

<b>Comparison</b>	<b><i>t</i>-test result</b>		
	<i>t</i>	<i>p</i>	<b>Result</b>
Sad – no reg v dist	<b>8.35</b>	<b>&lt;.001</b>	<b>Distraction reduced sadness.</b>
Sad – no reg v reap	-.08	.94	Reappraisal did not reduce sadness.
Anger – no reg v dist	<b>17.80</b>	<b>&lt;.001</b>	<b>Distraction reduced anger.</b>
Anger – no reg v reap	<b>15.03</b>	<b>&lt;.001</b>	<b>Reappraisal reduced anger.</b>
Fear – no reg v dist	1.47	.14	Distraction did not reduce fear.
Fear – no reg v reap	<b>3.87</b>	<b>&lt;.001</b>	<b>Reappraisal reduced fear.</b>

*Note.* ‘No reg’ refers to the no regulation condition, ‘dist’ refers to the distraction condition, and ‘reap’ refers to the reappraisal condition in the ERT. Significant values appear in bold.

**Table 5.6**

*Means (M) And Standard Deviations (SD) Of ER Effectiveness Variables*

	<b>Males</b>		<b>Females</b>		<b>Total</b>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Sadness reappraisal	-.09	.80	.09	1.02	.00	.91
Sadness distraction	.31	.81	.83	1.03	.56	.96
Anger reappraisal	1.00	.95	1.04	.98	1.02	.96
Anger distraction	1.03	.97	1.49	.97	1.25	1.00
Fear reappraisal	.07	.66	.36	.83	.21	.76
Fear distraction	-.11	.65	.28	.84	.08	.77

*Note.* Positive values represent a reduction in emotion (i.e., more effective ER), and negative values represent an increase in emotion after implementing the regulation strategy (i.e., less effective ER).

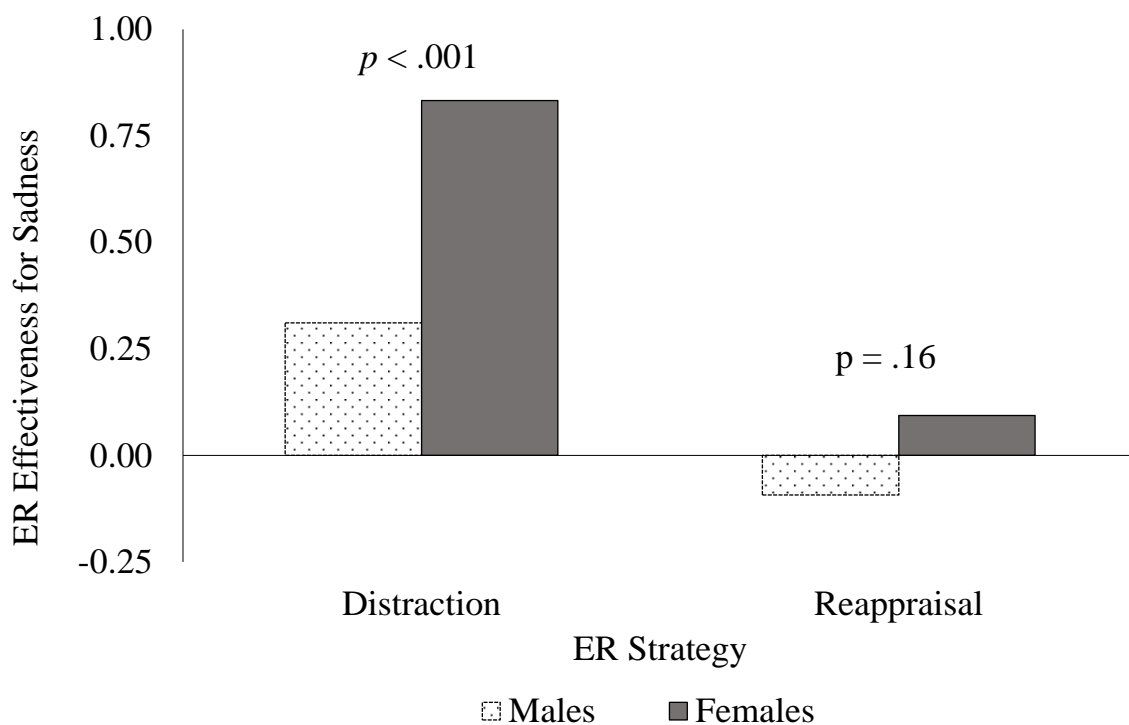
### 5.4.5. Testing Gender Differences in the Regulation of Sadness, Anger, and Fear Using ANOVA

**5.4.5.1. Model 1: Testing Gender Differences in the Regulation of Sadness.** A 2 x 2 ANOVA was used to test for gender differences in the regulation of sadness using distraction and reappraisal. The IVs were Gender (Males, Females; between subjects) and ER Strategy (Reappraisal, Distraction; within subjects). The DV was ER effectiveness for sadness. The mean ER effectiveness values are shown in Table 5.6, and the results are depicted in Figure 5.3.

The main effect of ER strategy was significant,  $F(1,195) = 121.65, p < .001, \eta_p^2 = .38$ . Distraction had a larger reduction in sadness than reappraisal. In fact, reappraisal did not show a reduction in sadness during the ERT. The main effect of gender was also significant,

**Figure 5.3**

*Bar Chart Showing ER Effectiveness for Males and Females, Using Distraction and Reappraisal to Regulate Sadness During the ERT*



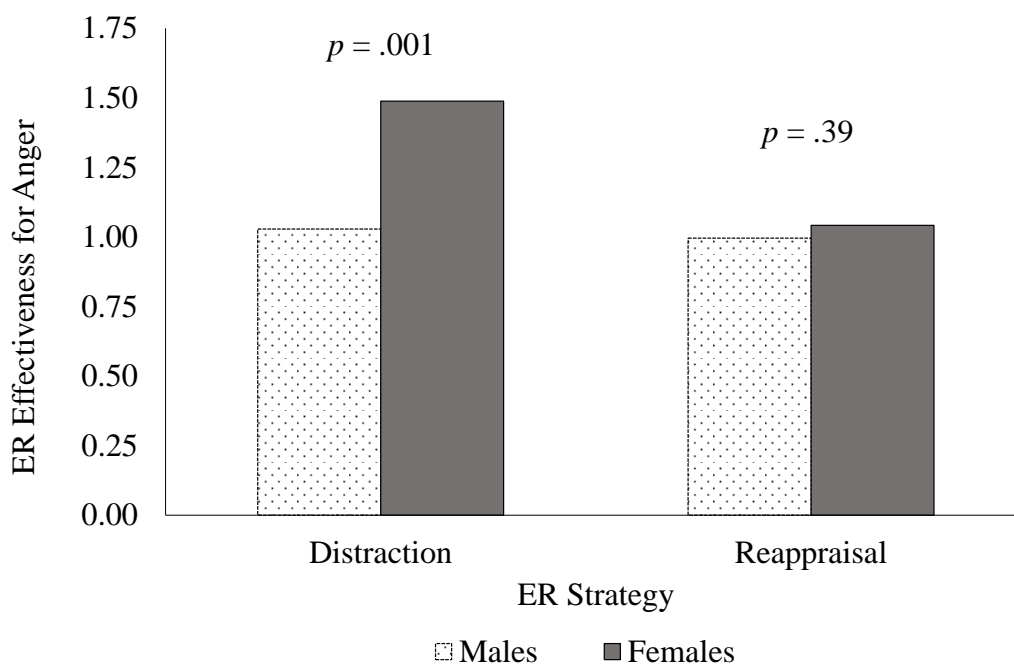
$F(1,195) = 7.94, p = .01, \eta_p^2 = .04.$ , with females having a larger reduction in sadness than males.

There was a statistically significant interaction between gender and ER strategy on the change in sadness,  $F(1, 195) = 8.87, p = .003, \eta_p^2 = .04$ . Simple main effects were run to determine the nature of this interaction, which involved testing for gender differences at each level of ER strategy (reappraisal and distraction). There were no gender differences in the change in sadness using reappraisal,  $F(1, 195) = 2.04, p = .16, \eta_p^2 = .01$ . However, compared to males, females had a larger reduction in sadness using distraction,  $F(1, 195) = 14.34, p < .001, \eta_p^2 = .07$ .

**5.4.5.2. Model 2: Testing Gender Differences in the Regulation of Anger.** In this 2 x 2 ANOVA, the IVs were Gender (Male, Female; Between subjects), and ER Strategy (Reappraisal, Distraction; Within subjects), and the DV was change in anger. The results are shown in Figure 5.4.

**Figure 5.4**

*Bar Chart Showing ER Effectiveness for Males and Females, Using Distraction and Reappraisal to Regulate Anger During the ERT*



The main effect of ER strategy was significant,  $F(1, 194) = 16.84, p < .001, \eta_p^2 = .08$ . Both reappraisal and distraction reduced anger during the task, but there was a larger reduction in anger from distraction compared to reappraisal. The main effect of gender was also significant,  $F(1, 194) = 5.83, p = .02, \eta_p^2 = .03$ , with females having a larger reduction in anger than males during the task.

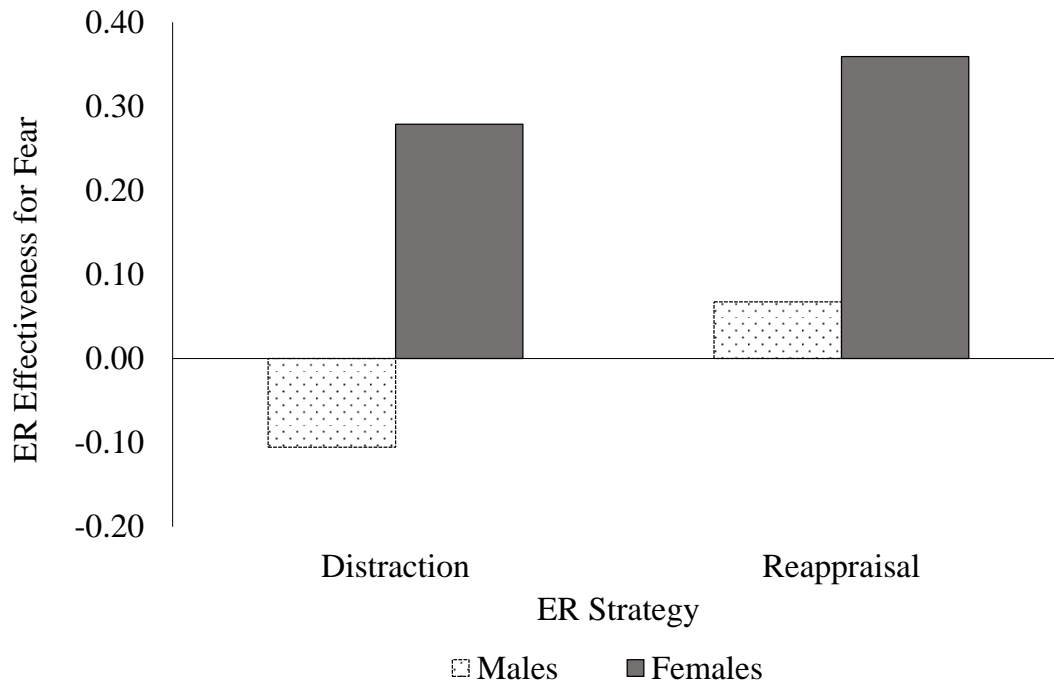
The interaction between gender and ER strategy on the change in anger was significant,  $F(1, 194) = 10.74, p = .001, \eta_p^2 = .05$ . The simple main effect for ER strategy showed that there were no gender differences in the change in anger using reappraisal,  $F(1, 194) = .75, p = .39, \eta_p^2 = .004$ . However, females had a larger reduction in anger using distraction than males,  $F(1, 194) = 12.17, p = .001, \eta_p^2 = .06$ .

**5.4.5.3. Model 3: Testing Gender Differences in the Regulation of Fear.** The third 2 x 2 ANOVA model tested for gender differences in the regulation of fear using reappraisal and distraction. The IVs were Gender and ER Strategy, and the DV was the change in fear levels. The results are depicted in Figure 5.5.

The main effect of ER strategy was significant,  $F(1, 190) = 7.03, p = .01, \eta_p^2 = .04$ . Reappraisal reduced fear, but distraction did not. The main effect of gender was also significant,  $F(1, 190) = 11.35, p = .001, \eta_p^2 = .06$ , with females having a larger reduction in fear than males using both reappraisal and distraction. The gender by ER strategy interaction was non-significant,  $F(1, 190) = .43, p = .51, \eta_p^2 = .002$ .

**Figure 5.5**

*Bar Chart Showing ER Effectiveness for Males and Females, Using Distraction and Reappraisal to Regulate Fear During the ERT*



## **5.5. Discussion**

### **5.5.1. Results of Study 2a**

There was partial support for the hypotheses of Study 2a, although the direction of some of the results were not as expected. There were gender differences in ER effectiveness for sadness, anger, and fear. However, these gender differences depended on the ER strategy, and the specific emotion being regulated. The results are summarised in Table 5.7.

### **5.5.2. Gender Differences in Emotion-General ER: Comparison to the Wider Literature**

Gender differences in ER were examined in an emotion-general manner to test if the results of the present study replicated those found in the wider literature. Males reported

**Table 5.7***Evidence for Study 2a*

<b>Research Questions</b>	<b>Evidence</b>
SRQ1. In line with the wider literature, can gender differences in the reported use of reappraisal, suppression, distraction, and rumination to regulate general emotion be replicated in the present study?	<ul style="list-style-type: none"> <li>• Males used suppression more than females.</li> <li>• No gender differences were found for reappraisal or rumination.</li> <li>• Distraction was not tested due to low reliability.</li> </ul>
SRQ2. Does the effectiveness of reappraisal and distraction depend on the specific emotion being regulated?	<ul style="list-style-type: none"> <li>• Reappraisal was effective at reducing anger and fear, but not sadness.</li> <li>• Distraction was effective at reducing sadness and anger, but not fear.</li> </ul>
SRQ3. Are there gender differences in the effectiveness of regulating sadness, anger, and fear using reappraisal and distraction, and do these gender differences vary according to the specific emotion and ER strategy?	<ul style="list-style-type: none"> <li>• Compared to males, females had a larger reduction in sadness and anger using distraction.</li> <li>• Compared to males, females had a larger reduction in fear using reappraisal and distraction.</li> </ul>

using suppression more than females to regulate their emotions, a result which is consistently reported amongst adults (Spaapen et al., 2014; Zimmermann & Iwanski, 2014), undergraduate students (Gross & John, 2003; Haga et al., 2009; Kwon et al., 2013; Melka et al., 2011), and children and adolescents (Gullone et al., 2010; Gullone & Taffe, 2012; Larsen et al., 2013; Zimmermann & Iwanski, 2014).

In contrast, no gender differences were found in the use of reappraisal or rumination to regulate general emotion. Some studies have failed to find a gender difference in reappraisal (Garnefski et al., 2004; Gross & John, 2003; Haga et al., 2009; Zlomke & Hahn, 2010). A possible reason for this lack of gender difference may be due to ER being measured in an emotion-general manner, as when strategies such as distraction are examined for

specific emotions, clearer gender differences emerge (Trives et al., 2016). For this reason, ER was also measured in an emotion-specific manner using the ERT in the present study.

However, a robust finding which is inconsistent with the results of the present study is that females tend to ruminate more than males, and this has been found with adolescents (Gomez-Baya et al., 2016; Hilt et al., 2010; Nolen-Hoeksema, 2001; Rood et al., 2009), community adults (Garnefski et al., 2004; Thomsen et al., 2005; Zimmermann & Iwanski, 2014), and students (Ando' et al., 2020), and so the lack of gender difference in rumination found in Study 2a is not in line with the wider literature.

A potential reason for this finding may be the characteristics of the sample in Study 2. The sample consisted of a high proportion (82%) of students. There is empirical evidence that undergraduate males are at a heightened risk for engaging in rumination (Gladstone & Koenig, 1994; Grant et al., 2002; R. Nolan & Willson, 1994), which would result in a smaller gap between males and females in the use of rumination and may eliminate the gender difference entirely. In the present study, students were more likely to report ruminating compared to the rest of the sample (see Section 5.4.2), and so it is possible that the male students were more prone to using rumination, which resulted in the gender difference in rumination disappearing. Research using the same measure of rumination as the present study, the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) has also found no gender differences in rumination amongst undergraduates (Roelofs et al., 2006).

However, other studies have found that amongst undergraduates, females are more likely than males to ruminate (Ando' et al., 2020). The reason for this discrepancy may be due to the measure of rumination that was used. The measure used in the present study, the RRS, asks about rumination within the context of depression. Rumination is associated with depression (Kovács et al., 2020; Liu et al., 2020), and rumination has been found to mediate

gender differences in depression (Jose & Brown, 2008; Nolen-Hoeksema et al., 1999; Thayer et al., 2003).

The studies which have found gender differences in rumination amongst undergraduate students, such as Ando' et al. (2020), tend to use measures which ask about rumination in general, not within the context of depression, such as the Rumination and Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999). On the other hand, the studies which do not find gender differences, such as Roelofs et al. (2006) and the present study, used measures which ask about rumination within the context of depression or sadness. It is possible that these measures are also tapping into levels of depressive symptoms. Therefore, it may be the case that student males are actually more depressed than males in the wider community, and this eliminates both the gender difference in depression, and the gender difference in rumination. Depressive symptoms were measured in the second part of Study 2 and are reported in Section 6.4.2.

It should also be noted that reporting lower rumination was associated with higher social desirability, and so it is possible that individuals may have been less likely to report using rumination if they were concerned about presenting themselves in a favourable light. In Study 1, participants largely reported their use of adaptive strategies, and so this is in line with the idea that people may be less inclined to report using maladaptive strategies if they are concerned about self-presentation. However, there was no difference in social desirability between the students and the rest of the sample, which means that social desirability decreasing the likelihood of reporting rumination was an issue across the whole sample, not just for students.



### ***5.5.3. Comparing the Effectiveness of Reappraisal and Distraction to Regulate Specific Emotions***

An important finding that emerged from the present research is that the effectiveness of reappraisal and distraction depended on the specific emotion being regulated. It was hypothesised that distraction would be more effective for anger and fear and reappraisal would be more effective for sadness, as previous research has found that distraction is used for more intense emotions and reappraisal is used for lower intensity emotions (Sheppes et al., 2011), and anger and fear are often thought of as more intense emotions than sadness (Lench et al., 2016).

Reappraisal emerged as a more effective strategy than distraction for reducing fear. However, distraction was more effective than reappraisal for reducing sadness and anger (although this also interacted with gender, with females being more effective than males at reducing sadness and anger using distraction). Therefore, these results were not entirely in the expected direction. However, this demonstrates that the effectiveness of an ER strategy depends on the specific emotion being regulated. In other words, how effective a strategy is at reducing an emotion depends on the emotional context.

Most of the previous research has examined the effectiveness of reappraisal and distraction in an emotion-general manner. These previous studies have found that reappraisal and distraction are both effective at reducing negative emotion (Gross, 1998a; Hermann et al., 2017; Quinn & Joormann, 2020; Smoski et al., 2014; Thiruchselvam et al., 2011), although distraction may be more effective than reappraisal at reducing general negative emotion (Smoski et al., 2014).

Reappraisal effectively reduced anger and fear, but not sadness in the present study. Research has shown that reappraisal is only effective at reducing sadness when it is implemented early in the emotion-generative process (Sheppes & Meiran, 2007).

Consequently, the reason for reappraisal failing to successfully reduce sadness in the present study may be that participants only used reappraisal when the emotional response had fully developed during the ERT, which may have reduced its effectiveness.

Distraction effectively reduced sadness and anger, but not fear. Distraction is helpful when used with high intensity emotions as it diverts attention away from the emotional stimulus before the emotional response has had the chance to fully develop (Sheppes et al., 2011). Research has shown that individuals have an attentional bias towards fearful stimuli (Van Bockstaele et al., 2014), particularly images of animals (Lipp & Derakshan, 2005; Mogg & Bradley, 2006), which were used in the present study. It may be the case that the fearful images used in the ERT grabbed the participants' attention, and thus made it more difficult to divert attention away from the images. This would result in distraction being a less effective strategy for reducing fear. Therefore, the present study is the first to demonstrate that the effectiveness of reappraisal and distraction depends on the specific emotion being regulated, with distraction being more effective for sadness and anger, and reappraisal being more effective for fear. This shows that the emotional context within which an ER strategy is used has an impact on its effectiveness.

The findings of the present study have important implications for the ER literature. According to Gross's (1998b) Process model of ER, distraction is a more effective strategy than reappraisal at reducing negative emotion because it appears earlier in the timeline of an unfolding emotional response. However, the process model does not take into account that the effectiveness of an ER strategy may differ according to the emotion being regulated. This highlights an important avenue for future development of this theory, to take into account emotion-specific differences that may occur in the process model.

The process model has the potential to provide a theoretical framework for emotion-specific ER, although no theorists have discussed the model in this way so far. This

approach allows for specific emotions to be regulated as part of separate process models. As outlined earlier in Section 1.2.2.3, appraisals are theorised to cause emotion differentiation (Scherer & Moors, 2019), which means that different appraisals give rise to specific emotions. An individual may have an appraisal that produces the feeling of sadness, and this can be regulated using a specific strategy such as reappraisal in one process model. On the other hand, a different appraisal of the same situation could elicit feelings of anger, which could be regulated using suppression in a different process model. This also explains the phenomenon of mixed emotions during an emotionally evocative situation (Roseman & Evdokas, 2004). Therefore, the results of the present research highlight the importance of examining ER in an emotion-specific manner. The process model is a potential framework for understanding and comparing the regulation of specific emotions.

#### ***5.5.4. Gender Differences in Reappraisal Effectiveness for Sadness, Anger, and Fear During the ERT***

The findings regarding gender differences in reappraisal effectiveness for sadness, anger, and fear will be discussed in this section. It was expected that females would be more effective at using reappraisal to regulate sadness than males, as evidenced by a larger reduction in sadness using reappraisal during the ERT. However, this was not the case, as there were no gender differences in reappraisal effectiveness for sadness. It was also expected that females would be more effective than males at reducing fear using reappraisal. This was found to be the case in the present study, with females having higher reappraisal effectiveness for fear than males (i.e., a larger reduction in fear using reappraisal), and so there was partial support for this hypothesis.

There are very few studies which have examined gender differences in ER using the ERT, as many of the studies which adopt this paradigm focus on one gender to increase

homogeneity in the sample, such as all females (Goldin et al., 2008; Gross & Levenson, 1997; McRae et al., 2010), or all males (Lazarus & Alfert, 1964; Notarius & Levenson, 1979), while others fail to test for gender differences (Boland et al., 2019; Gross, 1998a; Jackson et al., 2000; Richards & Gross, 2000; Sheppes & Meiran, 2007; Sheppes et al., 2011; Sheppes et al., 2014). Similarly, there are no studies to date which have examined the regulation of multiple specific emotions using the ERT.

In terms of general negative emotion, a study by McRae et al. (2008) examined gender differences in reappraisal during the ERT to reduce emotion in response to negative pictures, which is similar to the method used in the present research. They used two measures of ER – self-reported negative emotion (i.e., subjective experience) which was also used in the present study, and activation of neural areas that are associated with ER, using functional magnetic resonance imaging (fMRI). In McRae et al. (2008), it was found that males and females had similar emotional reactivity to the negative images. This means that males and females self-reported similar levels of negative emotion while viewing the negative images during the no regulation condition. This contrasts with the findings of the present study, which found that females reported higher levels of sadness and fear in response to the sadness and fear images (i.e., the images that were chosen to target these emotions), but there were no gender differences in self-reported anger levels in response to the anger images.

This discrepancy in gender differences in emotional reactivity (i.e., self-reported emotion levels in response to the negative images in the no regulation condition) between McRae et al. (2008) and the present study could be due to two reasons. Firstly, it may reflect the fact that McRae et al. (2008) used general negative images with a variety of themes, whereas in the present study, images were carefully chosen to induce the specific emotions of sadness, anger, and fear, by ensuring these images included content that had been shown to induce these specific emotions (Mikels et al., 2005). It may be the case that gender

differences in emotional reactivity do exist when this is examined for specific emotions individually. However, it is also possible that gender differences in the reporting of sadness and fear during the no regulation condition is actually influenced by individuals conforming to gender stereotypes about specific emotions, i.e., that sadness and fear are more ‘feminine’ emotions, that are more acceptable for females than males to experience and express (Root & Denham, 2010). The cultural messaging around sadness and fear would be less likely to be captured using the general negative emotion scale used by McRae et al. (2008).

In terms of ER, McRae et al. (2008) found no gender differences in the reduction of negative emotion using reappraisal during the task. In other words, there were no gender differences in reappraisal effectiveness. This finding may indicate that males and females have similar skills in regulating their general negative emotion using reappraisal. However, the findings of the present study build on the findings of McRae et al. (2008), and give nuance to these results, by demonstrating that gender differences in ER effectiveness depend on the specific emotion.

In the present study, females were more effective than males at reducing fear using reappraisal, but there were no gender differences in reappraisal effectiveness for sadness or anger. Therefore, it may be the case that McRae et al. (2008) failed to find a gender difference in ER effectiveness during the ERT because this was not measured in an emotion-specific manner (i.e., by carefully choosing stimuli to induce the target emotion, and using separate scales to measure specific emotions). When this is examined in an emotion-specific manner, gender differences emerge.

Further, the finding that females are more effective at reducing fear using reappraisal is consistent with the findings of Study 1. In Study 1, females reported that they were more likely to use reappraisal to regulate fear compared to males, but this gender difference was not found for sadness or anger. The findings of Study 1 and Study 2 together demonstrate that

compared to males, not only do females use reappraisal more frequently when they are experiencing fear, but they are also more effective at doing so.

Although there are no studies examining gender differences in the use of reappraisal in the context of fear, previous research has examined the relationship between gender and fear more generally. Females tend to report experiencing greater fear and have a higher risk of developing anxiety disorders than males (McLean & Anderson, 2009). The finding that females are more effective than males at reducing their fear response may reflect the fact that females have had more experience with this emotion and therefore have had more opportunity to develop skills in reducing fear. Females may also have a more severe threat appraisal than males (Kucharska, 2017; Tamres et al., 2002), which means that females interpret events in a more negative light, which may result in females experiencing a larger fear response (Campbell & Muncer, 2017). Reappraisal involves changing the initial appraisal of an emotional stimulus (Gross, 1998a), and so if females are instructed to use reappraisal during the ERT, this may result in an initial threat appraisal being changed to something more neutral, which would result in females' larger fear response decreasing to comparable levels to males, which was found in the present study.

#### ***5.5.5. Gender Differences in Distraction Effectiveness for Sadness, Anger, and Fear During the ERT***

The findings regarding gender differences in distraction effectiveness for sadness, anger, and fear will be discussed in this section. It was expected that males would be more effective at using distraction to reduce sadness, as evidenced by a larger reduction in sadness using distraction. A gender difference did emerge, but this was in the opposite direction as predicted, with females having a larger reduction in sadness using distraction (i.e., higher

distraction effectiveness for sadness). No gender differences in the regulation of anger were expected, however, it emerged that females were also more effective than males at reducing anger using distraction. Therefore, compared to males, females had higher distraction effectiveness for both sadness and anger.

The findings of the present study, that females are more effective at reducing sadness using distraction, are in contrast with findings in the wider literature that males are more likely to report using distraction when they feel sad. In Trives et al. (2016), undergraduate students aged 18-29 and older adults aged 50-76 were asked to report on their ER when they feel discouraged, sad, or depressed using the Response Styles Questionnaire (RSQ). Males were found to report using distraction more than females when they felt sad (Trives et al., 2016). This has also been found amongst adolescents. In Gomez-Baya et al. (2016), adolescents aged 12-15 were asked to report on their response styles when they feel sad, using the Children's Response Styles Scale (CRRS). Males reported using distraction more than females when they felt sad, and the use of distraction for sadness decreased for females over time (Gomez-Baya et al., 2016).

These findings appear to be in contrast to the findings of the present study. However, it is important to highlight the difference between cognitive distraction and behavioural distraction. In the present study, cognitive distraction was measured, which involves cognitively removing attention from the emotional stimulus by thinking about something unrelated. On the other hand, behavioural distraction involves doing something unrelated to the emotional situation (e.g., going out with friends to distract yourself). In the studies which found that males were more likely to distract, a mix of behavioural and cognitive distraction were measured using the RSQ and the CRSS. In the present study, where females were more effective at reducing sadness using distraction, only cognitive distraction was measured. It may be the case that males are more likely to behaviourally distract, whereas females are

more likely to cognitively distract. This is in line with evidence that females use more cognitive ER strategies than males (Garnefski et al., 2004).

It is also important to draw attention to the difference between ER effectiveness and ER frequency. As discussed in Section 3.3, ER frequency is how often a strategy is used, but it is not necessarily interchangeable with how skilfully a strategy is used. It is possible that males use distraction (particularly behavioural distraction) more often than females, but females are more skilled than males at reducing feelings of sadness using distraction (particularly using cognitive distraction). Further, there is evidence that females generally report experiencing more negative affect in their daily lives compared to males (Thomsen et al., 2005) and experience more negative life events (Nolen-Hoeksema, 2001), and thus may be more practiced at using ER strategies such as distraction to reduce negative emotions.

For anger, a similar pattern was found than that for sadness. Compared to males, females had a larger reduction in anger using distraction, which suggests that females may be more effective than males at reducing anger using distraction. There are very few studies examining gender differences in the use of distraction as an ER strategy for anger. In a study by Rusting and Nolen-Hoeksema (1998), when given the choice during an experiment, females were more likely to choose to distract themselves (rather than ruminate) when they felt angry, but this was not the case for males. This may indicate that females are more likely than males to try to downplay or avoid feelings of anger, which is in line with gender socialisation theories which state that anger is seen as a less acceptable emotion for females to express (Brescoll & Uhlmann, 2008; Root & Denham, 2010). If females are more likely to use distraction to regulate anger in order to avoid this feeling, then this would be consistent with females being more effective at reducing anger using distraction, which was found in the present research.



However, this finding is in contrast with a study by Cox et al. (2000), who measured anger expression styles amongst children and adolescents aged approximately 9-14 years old. No gender differences in anger distraction were found, which may indicate that males and females are equally likely to distract from feelings of anger in childhood. Although no gender differences in distraction emerged, gender differences in other aspects of anger were found in the study by Cox et al. (2000). Females scored higher on anger-in (denying, suppressing, or internalising anger) and anger control (attempts to maintain discipline over one's anger) compared to their male counterparts, and males scored higher on anger-out (outward expression of anger). This demonstrates that even from as young as 9 years old, females are suppressing and trying to maintain control over their anger response. It may be the case that females learn distraction as an ER strategy as they get older, in order to maintain control over anger and avoid anger expression, which is consistent with females being more effective at reducing anger using distraction.

Females were also more effective than males at reducing fear using distraction. A robust finding in the literature is that females report experiencing more fear than males (Coreia et al., 2017; C. P. Li, 2018; McLean & Anderson, 2009; McLenon & Rogers, 2019; Yildirim et al., 2021), and this was mirrored in the present study by females reporting higher levels of fear in the no regulation condition compared to males. There is also evidence that females are more likely than males to have an attentional bias towards fearful stimuli (Catuzzi & Beck, 2014; Conway et al., 2007; Goos & Silverman, 2002; McClure, 2000; Tan et al., 2011), which means that females find it more difficult to remove attention from stimuli which is perceived as threatening. In other words, females pay more attention to perceived threats in their environment. In the ERT, the participants were instructed to remove their attention from the emotional stimulus and think of something unrelated. It is possible that females were able to follow this instruction and remove their attention from the emotional

stimulus, which resulted in a reduction in self-reported fear. As females had a large fear response to the fearful images, this meant that females had a larger reduction in fear, i.e., higher ER effectiveness. Therefore, although females have an attentional bias towards fearful stimuli, it is possible that females were also able to successfully remove attention from the emotional stimuli when instructed to during the task, which is in line with their higher ER effectiveness using distraction to reduce fear.

#### ***5.5.6. Limitations of this Study***

A number of assumptions are made when conducting research with the ERT. It is assumed that a reduction in negative emotion during the ERT represents an effective use of ER (ER effectiveness), a skill which an individual may possess in their daily lives. When computing ER effectiveness scores, the difference between the level of emotion in the ‘no regulation’ condition and the ‘regulation’ condition is thought to represent a reduction in emotion using the ER strategy. However, it is possible that participants may not report their emotions accurately, or may have different levels of emotions elicited by the images in different conditions of the task, which would result in the ER effectiveness scores being less accurate. Although this is a potential limitation of using this paradigm, ER effectiveness scores have been used in several studies with much success (Albanese et al., 2019; Douw et al., 2020; Fitzgerald et al., 2019; Goldin et al., 2008; Gross, 1998a; Gross & Levenson, 1997; Jackson et al., 2000; Lazarus & Alfert, 1964; Notarius & Levenson, 1979; Ochsner et al., 2002; Richards & Gross, 2000; Sheppes et al., 2014; Sheppes & Meiran, 2007; Sullivan & Kahn, 2020).

During the ERT, it is also assumed that participants are engaged with the task and that they execute the ER strategy as instructed. In the present research, this limitation was addressed by asking participants to briefly describe how they implemented the strategy

during the task. These text responses were reviewed by the researcher and judged to demonstrate sufficient engagement with the task. Nevertheless, it cannot be completely guaranteed that the participant has fully followed the task instructions.

It should also be noted that in the ERT, each emotional picture appeared with the same instructions (no regulation, reappraisal, or distraction) for all participants. Although this has the advantage of ensuring that the task was consistent across all the participants, it also poses the risk that if a certain picture perhaps was not a strong elicitor of a certain emotion, then this may affect the ER effectiveness score as this picture was shown for this condition for all of the participants. For example, if one of the pictures shown in the no regulation condition was not a strong elicitor of sadness, then this may result in the sadness score being low in the no regulation condition which would lead to the ER effectiveness score being low (even if that individual was skilled in that ER strategy). Although this is a possibility using this method, the emotion scores in each condition were averaged across a number of trials (i.e., a number of different images), which reduces the chance of this issue occurring.

Furthermore, this study used a repeated measures design, which means that all participants took part in all conditions of the ERT. The trials were presented in a randomised order for different target emotions, and for reappraisal and distraction. This design poses the risk that there was contamination between the trials, such as participants still experiencing residual emotion from a previous trial. However, it is assumed that during the ERT, the emotional response subsides during the final stage of each trial which involved the participant briefly describing the strategy they used (see Figure 5.1), and during the beginning of the next trial during the fixation point screen. Also, when the emotional image is presented in the next trial, it is expected that a new emotional response will occur. Another approach would be to include a temporal aspect to the experiment, which would involve measuring baseline levels of emotion before the image and regulation instructions are presented. This may be

beneficial as it would potentially allow for gender differences in baseline levels of emotion to be examined. Also, using a between-subjects design in which participants only take part in one condition may reduce this risk of contamination, although this approach would require a much higher sample size, and would increase variance from individual differences.

The present study used cross-sectional data, which means that all the data were collected at one time-point. The ability of participants to regulate their emotions in the short term was examined. This means that no claims can be made about the causal relationships between variables, the impact of ER over time, or habitual ER.

### ***5.5.7. Implications of Findings***

The present study is the first to examine gender differences in the effectiveness of regulating multiple specific emotions (sadness, anger, and fear) using distraction and reappraisal. The findings from the present research thus contribute important novel knowledge to the literature. Firstly, it demonstrates that the relationship between gender and ER depends on the specific emotion being regulated. For example, a similar pattern of gender differences in ER emerged for sadness and anger, however the pattern for fear was different. Therefore, this highlights the importance of investigating gender differences in ER in an emotion-specific manner. It cannot be assumed that the findings regarding one specific emotion, or general negative emotion, can be extrapolated to all emotions.

Secondly, some strategies seem to be better suited to regulating certain emotions over others, with the effectiveness of reappraisal and distraction being dependent on the specific emotion. Specifically, distraction was more effective at reducing sadness and anger during the ERT (although this interacted with gender), whereas reappraisal was more effective at reducing fear and anger. The effectiveness of a strategy to reduce negative emotion in the short-term has been associated with other correlates of ER, such as wellbeing, depression,

and bipolar disorder (Kanske et al., 2012; Kjørstad et al., 2016; McRae et al., 2012b). This means that if these strategies are effective at regulating emotions before they become maladaptive responses, then this can have a positive impact on a range of outcomes.

Importantly, the results from this study show that the effectiveness of ER strategies depends on both (1) gender, and (2) the emotion being regulated. This has important implications for therapeutic practices and may implicate reappraisal and distraction in efforts to promote mental health and wellbeing. Specifically, this may help to guide more individualised treatments for mood and anxiety disorders, depending on whether the patient is experiencing more sadness-based problems, such as depression, or more fear-based problems, such as anxiety disorders or phobias. If an individual is presenting with a more sadness-based problem such as depression, or an anger-based problem such as aggressive behaviour, then distraction may be more effective at reducing these symptoms (although this is particularly relevant for females). This includes therapies that feature distraction at the centre of their teachings, such as dialectical behavioural therapy. On the other hand, if people have more fear-based problems such as anxiety or phobias, then therapies which focus on reappraisal techniques may be better suited to treating this, such as cognitive behavioural therapy.

The main consideration that arises from these findings is that therapies for clinical disorders should be personalised and tailored to an individual's specific needs, particularly along the lines of gender, and the specific type of emotional problem that the individual is presenting with. The relationship between gender, emotion-specific ER, and variables associated with mental health will be explored further in Chapter 6.

## **5.6. Conclusion and Next Steps**

To summarise, the aims of Study 2a were (1) to examine if there were gender differences in emotion-general ER, in line with the wider literature, and (2) to test if there are

gender differences in the effectiveness of regulating sadness, anger and fear using reappraisal and distraction.

There was partial support for the hypotheses of the present study. The effectiveness of ER was dependent on the specific emotion being regulated – reappraisal was effective at reducing anger and fear, but not sadness, and distraction was effective at reducing sadness and anger, but not fear. Gender differences also emerged in the regulation of sadness, anger, and fear, although the patterns differed according to the specific emotion being regulated. Females were more effective than males at reducing sadness and anger using distraction. Females were also more effective than males at reducing fear using both distraction and reappraisal. These findings show that the relationship between gender and ER depends on the specific emotion being regulated, and so it is imperative for future research to investigate gender differences in ER in an emotion-specific manner. These findings also have implications for personalising mental health therapies.

The results of the present study demonstrate that certain strategies may be more effective for certain emotions, and females may be more effective at reducing some emotions compared to males. However, ER effectiveness is not necessarily interchangeable with how adaptive an ER strategy is. Effectiveness refers to the ability of a strategy to reduce negative emotion. On the other hand, adaptiveness refers to the relationship an ER strategy has with other variables, such as variables associated with mental health. It is possible that a strategy may be effective for reducing a negative emotion but does not have an adaptive relationship with other variables (e.g., it has a maladaptive relationship with mental health).

As discussed in Chapter 2, there are gender differences in variables associated with mental health, such as depression, self-harm behaviours, and suicidal ideation. ER is also known to play a role in mental health. Some studies have examined whether ER can explain gender differences in variables associated with mental health, however no study to date has

examined this in an emotion-specific manner. In the second part of Study 2, which is reported in Chapter 6, the data from the ERT will be used to examine if the regulation of specific emotions is related to gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation.

#### KEY POINTS FOR CHAPTER 5

1. The aims of Study 2a were (1) to examine if there are gender differences in emotion-general ER, in line with the wider literature, and (2) to test if there are gender differences in the effectiveness of regulating sadness, anger and fear using reappraisal and distraction.
2. Emotion-specific findings emerged. Females were more effective than males at reducing sadness and anger using distraction. For fear, females were more effective than males at reducing fear overall, using both reappraisal and distraction.
3. Distraction may be more effective for reducing sadness and anger (although this also depends on gender), whereas reappraisal may be a more effective strategy for fear and anger.
4. The results highlight the importance of examining ER in an emotion-specific manner, and demonstrate that the effectiveness of ER may depend on gender and the specific emotion being regulated.

#### QUESTIONS FOR SUBSEQUENT CHAPTERS

1. Is the regulation of sadness, anger, and fear related to gender differences in the variables associated with mental health?

#### NEXT STEPS

In Study 1 and Study 2a, some emotion-specific gender differences in ER emerged. We know from previous research that there are gender differences in mental health problems, and ER may mediate the relationship between gender and mental health. However, no studies to date have examined these relationships in an emotion-specific manner. In Study 2b, the relationships between gender, emotion-specific ER, and mental health, will be examined. Study 2b will be reported in Chapter 6.

## **Chapter 6: The Regulation of Sadness, Anger, and Fear as Mediators of Gender Differences in Variables Associated with Mental Health (Study 2b)**

### **6.1. Chapter Summary**

Study 2a is reported in Chapter 5. The second part of Study 2, Study 2b, is described in the present chapter. The findings from Study 1 and Study 2a demonstrate that gender differences are often (but not always) emotion-specific. ER has an important impact on mental health, and there are prominent gender differences in variables associated with mental health, so it is possible that the way males and females regulate their emotions may play a role in gender differences in variables associated with mental health. Some researchers have addressed this question within the context of Response Styles Theory, but no studies to date have examined this in an emotion-specific manner. The aims of Study 2b were (1) to test if there are gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation, in line with the wider literature, and (2) to examine if the regulation of specific emotions using reappraisal and distraction are related to gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation.

To address these aims, participants completed self-report questionnaires measuring variables associated with mental health and took part in the Emotion Regulation Task (ERT). In the ERT, the change in self-reported levels of sadness, anger and fear after using reappraisal or distraction was measured (i.e., ER effectiveness). Mediation analyses were conducted to explore the relationships between gender, emotion-specific ER, and variables associated with mental health. Females were more effective at reducing anger using distraction, and this was associated with higher depressive symptoms and lower suicidal ideation, and so the Study 2b hypotheses were partially supported. These findings indicate that emotion-specific ER may be related to gender differences in variables associated with mental health, and this has implications for theory and therapeutic practice.



## **6.2. Introduction**

### ***6.2.1. Rationale for Study 2b***

Few studies have examined gender differences in ER in an emotion-specific manner. In Study 1, gender differences in the reporting of some (but not all) ER strategies were found to vary across specific emotions. In Study 2a, females were more effective than males at reducing sadness and anger using distraction, and females were also more effective than males at reducing fear using both distraction and reappraisal, which demonstrates that gender differences in ER are often emotion-specific. An important next step for this research is to examine if these emotion-specific findings also have implications for variables associated with mental health.

As discussed in Chapter 2, ER may have an impact on variables associated with mental health (Aldao et al., 2010; Zahniser & Conley, 2018). Reappraisal and distraction are generally considered to be adaptive strategies which have a positive association with mental health and wellbeing (Huffziger et al., 2009; Zahniser & Conley, 2018). There are also prominent gender differences in variables associated with mental health. Compared to males, females tend to have higher levels of depression, self-harm regardless of intent, and suicidal ideation (Barzilay et al., 2019; H. Chen et al., 2019; Hawton et al., 2012; Knudson et al., 2020), but more males die by suicide (National Records of Scotland, 2021). Thus, it is possible that ER plays a role in these gender differences in variables associated with mental health. In the present research, the relationships between gender, ER, and variables associated with mental health will be examined in an emotion-specific manner.

As a first step of this research, gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation were tested, to examine if the gender differences observed in the wider literature were also found in the sample of the present study. Therefore, the first

aim of the present study is to examine if the gender differences in variables associated with mental health found in the wider literature can be replicated in the present study.

Depressive symptoms, self-harm behaviours, and suicidal ideation were chosen as the variables for the present research for two key reasons. First of all, depression and suicide represent two of the biggest global challenges in public health. Almost 280 million people are affected by depression worldwide, and 700,000 people die by suicide each year (World Health Organisation, 2021b, 2021c). These are serious mental health problems that affect a large number of people. We know that ER can have a positive impact on mental health, and there is evidence that ER can improve outcomes for people with depression and who struggle with suicidal behaviour (Cludius et al., 2020; Dryman & Heimberg, 2018). Depressive symptoms were chosen as a measure of depression, and self-harm and suicidal ideation are two of the biggest risk factors for eventual suicide.

The second reason is that there are prominent gender differences in depressive symptoms, suicidal ideation, and self-harm. Females have higher rates of depression, and are more likely to self-harm and attempt suicide (Knudson et al., 2020; Wetherall et al., 2020), although more males die by suicide (National Records of Scotland, 2021). There is evidence that ER contributes to these mental health variables (Cludius et al., 2020; Dryman & Heimberg, 2018). Therefore, examining gender differences in ER represents an opportunity to better understand the variables which may be associated with depression, suicidal ideation and self-harm.

As discussed in Section 2.3.4, some research has examined ER as a mediator of gender differences in variables associated with mental health, within the context of Response Styles Theory (RST; Nolen-Hoeksema, 1987). These studies have found that rumination explains some of the gender differences found in depression (L. D. Butler & Nolen-Hoeksema, 1994; Gomez-Baya et al., 2016; Hilt et al., 2010; Nolen-Hoeksema, 1991; Nolen-

Hoeksema et al., 1999; Nolen-Hoeksema et al., 1993; Nolen-Hoeksema, 1995; Trives et al., 2016). Therefore, this research demonstrates that there is a relationship between gender, ER, and mental health, and this may be extended to include other ER strategies (i.e., reappraisal and distraction), and other variables associated with mental health (i.e., depression, self-harm behaviour, and suicidal ideation). ER has been found to predict mental health outcomes prospectively (Brewer et al., 2016; Huffziger et al., 2009; S. L. Johnson et al., 2016; Kelley et al., 2019; Nolen-Hoeksema et al., 1999; Zahniser & Conley, 2018).

In the present research, the relationships between gender, emotion-specific ER, and variables associated with mental health (depressive symptoms, self-harm behaviours, and suicidal ideation) will be investigated in an exploratory manner. This study is cross-sectional, which means that the associations between these variables, rather than causal relationships, are being explored. Although mediation analysis is used to understand these relationships, no claim is being made about the causal direction of these relationships. The present study is exploratory in nature.

No research to date has examined the relationships between gender, emotion-specific ER, and mental health in this manner. The regulation of specific emotions has been found to have a differential relationship with variables associated with mental health (Boland et al., 2019; A. Bradley et al., 2019; Clear et al., 2019; du Pont et al., 2018; Leaberry et al., 2019; Peled & Moretti, 2010). Therefore, it is also possible that the regulation of specific emotions may have a different relationship with gender, and the variables associated with mental health.

In the present study, reappraisal and distraction were focused upon. These two strategies in particular were chosen because (1) evidence regarding gender differences in reappraisal and distraction tend to be mixed, and a reason for this may be that previous research has not investigated this in an emotion-specific manner, (2) they are two of the most

widely research strategies in the literature, (3) they both derive from Gross's process model of ER, (4) they are adaptive strategies which are associated with positive outcomes, and (5) they have clinical relevance in that they are associated with mental health variables.

Reappraisal and distraction are both effective at reducing negative emotion (Gross, 1998a; Quinn & Joormann, 2020; Smoski et al., 2014), and are adaptive strategies which are associated with positive outcomes (Aldao et al., 2010; In et al., 2021; Polanco-Roman et al., 2015), and so it is important to understand if there are gender differences in these strategies, as they can contribute to mental health and wellbeing (Brewer et al., 2016; Huffziger et al., 2009; Zahniser & Conley, 2018). According to the process model, distraction is thought to be more effective than reappraisal (Gross, 1998a). However, the findings of Study 2a show that this depends on the specific emotion being regulated. Distraction emerged as being more effective for regulating sadness and anger (but not fear), and reappraisal was more effective for regulating anger and fear (but not sadness). This means that the effectiveness of these strategies was dependent on the specific emotional context. Consequently, it is important to also examine if gender differences in reappraisal and distraction have a different relationship with variables associated with mental health depending on the specific emotion being regulated, which will be investigated in the present study.

Further, no studies to date have compared these two ER strategies (reappraisal and distraction) across three variables associated with mental health (depressive symptoms, self-harm behaviours, and suicidal ideation). An examination of the relationship between gender, ER, and variables associated with mental health in an emotion-specific manner will contribute to the wider literature by testing if the regulation of specific emotions (1) contributes to gender differences in variables associated with mental health and (2) has a differential impact on gender differences in variables associated with mental health. Both depression and suicide are serious public health issues (World Health Organisation, 2021b,

2021c), and so it is crucial to examine the factors which may contribute to these issues. Therefore, the second aim of the present study is to examine if the regulation of sadness, anger, and fear using reappraisal and distraction mediates the relationship between gender and depressive symptoms, self-harm behaviours, and suicidal ideation.

In terms of measuring the key variables of the present study, self-report questionnaires measuring depressive symptoms are a common method of measuring sub-clinical depression in ER research (Aldao et al., 2010; Garnefski et al., 2004; Gross & John, 2003; Nolen-Hoeksema & Aldao, 2011), and are correlated with clinical diagnoses (Wang et al., 2017). Furthermore, wellbeing tends to be negatively correlated with depressive symptoms and poor mental health (Tennant et al., 2007). Thus, a measure of psychological wellbeing was included in the present study as an additional tool to gauge the levels of general wellbeing in the sample, and to test if there were gender differences in wellbeing.

Suicide cannot be directly observed using a cross-sectional design, and so suicidal ideation and self-harm behaviours were measured in the present study using self-report measures. Suicidal ideation, or having thoughts about suicide, is an important predictor of future suicide risk (O'Connor & Nock, 2014). Self-harm behaviours are also related to suicide. Individuals often report having thoughts about suicide while engaging in self-harm behaviours (Klonsky, 2011), and self-harm irrespective of intent is a risk factor for future suicide (Andover et al., 2012)

In terms of gender differences, females report engaging in self-harm behaviours more than males, whether this is measured without suicidal intent (Bresin & Schoenleber, 2015; Knudson et al., 2020), or includes suicidal intent (Knudson et al., 2020; Wetherall et al., 2018). However, more males die by suicide (National Records of Scotland, 2021). Therefore, measuring self-harm and suicidal ideation may provide insight into suicide risk, and so it is

important to examine the factors which may contribute to these behaviours, such as emotion-specific ER.

### **6.2.2. Research Questions for Study 2b**

There were two specific research questions (SRQs) for Study 2b:

- SRQ1. Are there gender differences in the reporting of depressive symptoms, self-harm behaviours, and suicidal ideation?
- SRQ2. Is there a relationship between gender, emotion-specific ER effectiveness and variables associated with mental health?

## **6.3. Method**

As study 2 was in two parts, information about the participants (Section 5.3.1), materials (Section 5.3.2), and procedure (5.3.3) can be found in Section 5.3. In this section, only the information that is unique to Study 2b will be reported.

### **6.3.1. Measures of Variables Associated with Mental Health**

The following self-report instruments were used to measure variables associated with mental health – Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) to measure depressive symptoms, Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007) to measure psychological wellbeing, the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) to measure self-harm behaviours, and the Suicidal Ideation Attributes Scale (SIDAS; van Spijker et al., 2014) to measure suicidal ideation.

**6.3.1.1. Centre for Epidemiologic Studies Depression Scale.** The CES-D is a 20-item scale which measures depressive symptoms in a non-clinical population. Examples of items on the CES-D include ‘I did not feel like eating; my appetite was poor’ and ‘I thought

my life had been a failure'. Participants indicate the extent to which they agree with these statements on a 4-point Likert scale ranging from 'rarely or none of the time (less than 1 day)' to 'most or all of the time (5-7 days)'. The CES-D is not a diagnostic measure, which means that it cannot provide a diagnosis of depression and obtaining a high score on this measure is not necessarily indicative of depression. However, the CES-D has been found to be a useful screening measure of depressive symptoms in the general population and has high internal consistency (Cronbach's  $\alpha = .85 - .90$ ) and adequate test-retest reliability ( $r = .40$  and higher; Radloff, 1997). The CES-D had a Cronbach's alpha of  $\alpha = .90$  in the present study, which demonstrates excellent internal consistency (DeVellis, 2016).

**6.3.1.2. Warwick-Edinburgh Mental Wellbeing Scale.** The WEMWBS is a 14-item measure of psychological wellbeing. The WEMWBS measures the extent to which participants agree with positively worded statements, such as 'I've been feeling optimistic about the future' and 'I've been feeling relaxed' on a 5-point Likert scale that ranges from 'none of the time' to 'all of the time'. The scale has been found to have high internal consistency (Cronbach's  $\alpha = .89 - .91$ ) and high test-retest reliability across one week ( $r = .83$ ; Tennant et al., 2007). The WEMWBS demonstrated excellent internal consistency in the present study, with a Cronbach's alpha of  $\alpha = .90$ . Wellbeing was not an variable of interest in the present research, but this was included to gauge any gender differences in general mental health within the sample, and also to see if there was a difference in psychological wellbeing between the students and the rest of the sample.

**6.3.1.3. Deliberate Self-Harm Inventory.** The DSHI is a 17-item measure of self-harm behaviours which enquires about various aspects of self-harm, including frequency, severity, duration, and type of self-harming behaviour. As described in Section 2.3.1, there is an ongoing debate as to the best way to conceptualise self-harm behaviours. Some researchers distinguish between self-harm behaviours without suicidal intent (i.e., NSSI) and

behaviours with suicidal intent (i.e., suicide attempts). However, the evidence base for this distinction is weak (Kapur et al., 2013). In the present research, self-harm refers to self-injury regardless of the motive or extent of suicidal intent, as there are prominent gender differences in self-harm both with (Knudson et al., 2020; Wetherall et al., 2018) and without (Bresin & Schoenleber, 2015; Knudson et al., 2020) suicidal intention.

Although the authors of the DSHI claim that it measures self-harm behaviours without suicidal intent (Gatz, 2001), in actuality it likely measures a mix of intentions. In the DSHI, some questions ask about self-harm behaviours without suicidal intent, e.g. ‘Have you ever intentionally (i.e., on purpose) cut your wrist, arms, or other area(s) of your body (without intending to kill yourself)?’. Other questions do not specify intent, e.g. ‘Have you ever intentionally (i.e., on purpose) done anything else to hurt yourself that was not asked about in this questionnaire? If yes, what did you do to hurt yourself?’. Therefore, it is likely that participants will report self-harm behaviours that had a mix of intentions, which is often the case with self-harm behaviour (Boergers et al., 1998; Hawton et al., 1982; Hawton et al., 2012; Madge et al., 2008).

The DSHI was chosen for the present study because it asks about a range of different self-harm behaviours, such as cutting, burning, biting, and hitting. Some of these behaviours are used more by females (e.g., cutting), and others are used more by males (e.g., burning) (Andover et al., 2010; Idig-Camuroglu & Gölge, 2018; Lundh et al., 2007). Therefore, using this measure is beneficial for the present study as it captures methods used by both males and females and so may reduce any gender bias that could emerge from using a measure of self-harm that focussed on a method that was used more by one gender (e.g., cutting).

In the DSHI, Participants answer ‘yes’ or ‘no’ to these questions asking about self-harm behaviour. If the participant answers ‘yes’, then there are 5 follow-up questions: ‘How old were you when you first did this?’, ‘How many times have you done this?’, ‘When was



the last time you did this?', 'How many years have you been doing this?' and 'Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment'. The DSHI has been found to have high internal consistency (Cronbach's  $\alpha = .82$ ; Gratz, 2001) and adequate test-retest reliability across 2-4 weeks ( $r = .68$ ; Gratz, 2001). In the present study, the DSHI had an acceptable internal consistency of  $\alpha = .71$  (DeVellis, 2016).

**6.3.1.4. Suicidal Ideation Attributes Scale.** In addition to self-harm behaviours, suicidal ideation was also measured in the present study. The SIDAS is a 5-item scale which measures the extent to which individuals have thoughts about suicide, and this scale has been validated for online use (van Spijker et al, 2014). The SIDAS not only measures the presence of suicidal thoughts, but also assesses the severity of these thoughts. Participants report the extent to which they have had suicidal thoughts over the past month using independent 10-point Likert scales that range from (for example) 'Never' to 'Always'. If the participant answered 'No' to the first question ('In the past month, how often have you had thoughts about suicide?') then they received a score of 0, which means that they did not have any suicidal ideation over the past month. The SIDAS has been found to have high internal consistency (Cronbach's  $\alpha = .91$ ; van Spijker et al., 2014) and good convergent validity with other measures of suicidal ideation ( $r = .82$ ; van Spijker et al., 2014). In the present study, SIDAS had a Cronbach's alpha of  $\alpha = .79$ , which is an acceptable level of internal consistency (DeVellis, 2016).

### **6.3.2. Analysis**

The hypotheses of the present study were tested using mediation analysis, which uses linear regression. Mediation analysis is a useful tool in psychological research, which can be utilised in a number of ways, including testing correlational relationships between variables, and testing potential causal relationships between variables. As the present study is cross-

sectional in nature, which means that all of the measurements were taken simultaneously (i.e., there was no temporal ordering of variables), mediation analysis was used to examine correlational relationships between the study variables, not to establish causality. Namely, it was used to test whether gender, emotion-specific ER, and variables associated with mental health are related to one another. Therefore, no claim is being made that any of these variables have a causal impact on any other variables. Mediation analysis was used as a tool to understand the relationships between the variables more deeply. However, the present study can be seen as the first step in testing potential causality between the variables. Specifically, that gender differences in emotion-specific ER may contribute to gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation. However, these results would have to be confirmed in a separate, longitudinal study.

The process outlined by Hayes (2017) was implemented to test for a mediation effect in the present study. This approach is in contrast to the causal steps method described by Baron and Kenny (1986). In the causal steps approach, each component of the model (e.g., the  $X \rightarrow M$  path, the  $M \rightarrow Y$  path) must be tested separately, using individual null-hypothesis tests, and each test must be significant before it can be concluded that there is a mediation effect. However, according to Hayes (2009), it is only the indirect effect which must be significant for a mediation effect to have occurred. The indirect effect,  $ab$ , refers to the product of the  $a$  path ( $X \rightarrow M$ ) and the  $b$  path ( $M \rightarrow Y$ ). If testing the indirect effect shows that the indirect effect is significantly different from zero, then it can be concluded that a mediation effect has occurred. In other words,  $X$  has impacted  $M$ , which in turn has impacted  $Y$ .

Hayes' approach to mediation has an advantage over the causal steps approach because it relies only on one significance test (which reduces the chance of Type II error). It is also not contingent on the total effect of  $X$  on  $Y$  being significant. Other methods, such as

the causal steps approach, assert that X must have a significant relationship with Y from the outset (Baron & Kenny, 1986). If it does not, then one cannot continue to test for a mediation effect using this approach. However, it is possible for X to exert a mediation effect on Y through M, even if a relationship between X and Y (i.e., that the total effect is different from zero) cannot be established through hypothesis testing (Hayes, 2017). This is because the total effect of X on Y is partitioned into the indirect effect ( $X \rightarrow M \rightarrow Y$ ), and the direct effect ( $X \rightarrow Y$ , while controlling for M). It is possible for these paths to have different signs (e.g., one can be positive, and one can be negative), so they can essentially cancel one another out. This would result in the total effect not being significantly different from zero (which is the first criterion that must be fulfilled in the causal steps approach). In other words, the indirect effect (which tells us if there has been a mediation) can be different from zero, even if the total effect is not (Hayes, 2017). In the present study, this would mean that a mediation effect could be tested for even if there were no gender differences in depressive symptoms, suicidal ideation or self-harm behaviour.

Furthermore, when conducting analyses, statistical inference can be tested in two ways. Firstly, a null hypothesis test can be conducted (e.g., the null hypothesis that there is no relationship between two variables) and the *p*-value shows the probability of finding that result by chance. A second method is to construct confidence intervals around an estimate and these intervals provide information about the margin of error of an estimate. If the confidence intervals do not contain zero, which means that it is unlikely the estimate is zero, then the null hypothesis can be rejected (with 95% confidence).

In the present study, the total effect and direct effects were tested using null hypothesis testing of the regression coefficients, using a *p*-value of  $<.05$  as the alpha. The indirect effect (which demonstrates if mediation has occurred) was tested using confidence intervals, as described by Hayes (2017). This method involves generating 95% percentile

bootstrapped confidence intervals around the regression coefficient for the indirect effects (for each potential mediator) and testing the null hypothesis that the indirect effect is equal to zero. If the confidence interval does not include zero this means that the indirect effect is unlikely to be zero (with 95% confidence), and so the null hypothesis can be rejected, and this finding indicates that there is a mediation effect.

Bootstrapped confidence intervals were used rather than other methods such as the Sobel test, because bootstrapped confidence intervals make no assumptions about the sampling distribution of the indirect effect (Hayes, 2017), and simulation studies have found that bootstrapped confidence intervals have more power and are more accurate than other estimation methods (Hayes & Scharkow, 2013; MacKinnon, Lockwood, & Williams, 2004).

## **6.4. Results**

### ***6.4.1. Data Screening and Assumptions***

**6.4.1.1. Outliers.** The data were screened for outliers by calculating Mahalanobis Distance, Cook's Values and Leverage Values for each of the final mediation models (Tabachnick & Fidell, 2014). Any cases with values over the cut-off level was removed from further analysis. Information about the specific number of outliers removed is provided in the section for each mediation model below.

**6.4.1.2. Normality and Linearity.** An assumption of linear regression is that residuals must be normally distributed. This assumption was tested by inspecting a histogram and probability (P-P) plot of standardised residuals for each model. Visual inspection of these charts indicated some minor issues with normality. That is to say, there was some evidence of slight positive skew for all of the mediation models.

According to Hayes (2017), this assumption is one of the least important in linear regression, and violation of normality is only problematic when residuals are severely skewed

and the sample size is small, which is not the case in the present research. Further, PROCESS is generally robust to violations of normality (Hayes, 2017). Therefore, no further action was taken to correct the normality of residuals.

In linear regression, the relationship between continuous variables must be linear. To test this assumption, the data for each pair of variables were displayed on scatterplots of the predictor variable plotted against the outcome variable. Visual inspection of these scatterplots confirmed that the relationship between each pair of variables was indeed linear, and so this assumption of linear regression was met.

**6.4.1.3. Homoscedasticity.** An assumption of linear regression is that the residuals (or errors) must be evenly spaced across the regression line, which is known as homoscedasticity (Field, 2017). This assumption was tested by plotting the standardised residuals against the standardised predicted values for each mediation model. Visual inspection of these scatterplots indicated that there was homoscedasticity in the data for most of the models. There was some evidence of heteroscedasticity in the mediation models for suicidal ideation, which has been highlighted in the individual sections for those models (Section 6.4.4.3 and 6.4.4.4). When evidence of heteroscedasticity was found, a heteroscedastic-consistent standard error estimator, HC3, was used in PROCESS to compute a standard error which is robust to violations of this assumption (Hayes, 2017).

**6.4.1.4. Multi-collinearity.** A correlation analysis between each of the predictor variables was conducted to ensure there was no multi-collinearity in the data. The variables were not highly correlated and so there was no evidence of multi-collinearity in the data.

**6.4.1.5. Power.** An a priori power analysis was conducted using the software G\*Power Version 3.1.9.2 (Faul et al., 2007) to determine the sample size required for the mediation analyses to be adequately powered. This analysis found that a sample size of  $n =$

143 was needed to find a small-medium effect at 0.80 power. As the sample size in the present study was  $n = 203$ , this means that the mediation analyses were adequately powered.

**Table 6.1**

*Correlation Analyses and T-Tests Showing the Relationship Between Age, Gender, and the Variables Associated With Mental Health*

Variable	Age		Depressive symptoms		Suicidal ideation	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Depressive symptoms	<b>-.19</b>	<b>.01</b>	-	-	-	-
Suicidal ideation	<b>-.16</b>	<b>.03</b>	<b>.56</b>	<b>.001</b>	-	-
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
Gender	-.98	.33	-	-	-	-
Self-harm behaviour	3.46	<.001	<b>-3.50</b>	<b>&lt;.001</b>	<b>-3.32</b>	<b>.001</b>

*Note.* *r* is the Pearson correlation coefficient, *p* is the *p*-value, *t* refers to the *t*-value in the *t*-tests, Age is the age of the sample. Significant values at  $p < .05$  are shown in bold. All tests are two-tailed.

#### 6.4.2. Descriptive Statistics

**6.4.2.1. Mental Health Characteristics of the Sample.** The questionnaires relating to variables associated with mental health provided an indication of the general mental health of the study sample. With regards to depressive symptoms, the mean depression score was  $M = 15.77$  ( $SD = 10.11$ ), and 43% of the sample scored 16 or higher in the CES-D, which is considered depressed (with 57% of the sample falling below this cut off for depression). This prevalence is comparable to other studies which have used the CES-D to measure depressive symptoms amongst adults (Flett, Besser, & Hewitt, 2014), and undergraduate students (Horgan, Kelly, Goodwin, & Behan, 2018), but the prevalence is high compared to studies which use other self-report measures of depression (M. Green & Benzeval, 2011).

In terms of self-harm behaviour, 31% of the sample reported a lifetime prevalence of self-harm, which is relatively high compared to other studies with young adults (O'Connor et al., 2018) and undergraduate students (Sivertsen et al., 2019), although is similar to other studies which use the DSHI with a community sample of young adults (Latimer, Meade, & Tennant, 2013).

The mean score for suicidal ideation was  $M = 3.00$  ( $SD = 6.37$ ), and 35% of the sample reported having suicidal thoughts (which is indicative of risk of self-harm with suicidal intention), while 3% of the sample reported severe ideation (a score of 21 or over) which indicates a high risk of self-harm with suicidal intention (Van Spijker et al., 2014). 65% of the sample reported no suicidal ideation. This prevalence is similar to other studies which use the SIDAS to measure suicidal ideation amongst adults (K. Mok et al., 2020; Van Spijker et al., 2014).

In terms of wellbeing, 19% of participants reported probable depression, 16% reported possible depression, 59% had average wellbeing, and 6% had high psychological wellbeing. The median wellbeing score was  $M = 48.00$ , which is similar to other studies conducted with community and student samples (Tennant et al., 2007). Therefore, the mental health scores found in the present research are comparable to studies which use similar measures, but may be slightly higher than studies which use alternative measures in the literature.

**6.4.2.2. Gender Differences in the Variables Associated with Mental Health.** *T*-tests were used to test for gender differences in depression, suicidal ideation, and psychological wellbeing. As self-harm behaviour was a dichotomous variable, chi-square analysis was used to test for gender differences in self-harm. The results of these analyses are presented in Table 6.2. There were no significant differences between males and females in any of the variables associated with mental health.

**Table 6.2**

*Gender Differences in Depressive Symptoms, Suicidal Ideation, Wellbeing, and Self-Harm Behaviours (Mean, M, and Standard Deviation, SD)*

	Males		Females		Total		Range		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Min	Max		
Depressive symptoms	16.88	10.51	14.61	9.59	15.77	10.11	0.00	51.00	1.61	.11
Suicidal ideation	3.17	6.08	2.83	6.69	3.00	6.37	0.00	36.00	.39	.70
Wellbeing	46.57	9.14	48.82	7.72	47.67	8.53	14.00	70.00	-1.90	.06
	% Y	% N	% Y	% N	% Y	% N			$\chi^2$	<i>p</i>
Self-harm behaviour	36.54	63.46	24.24	75.76	30.54	69.46	-	-	3.62	.06

Note.  $\alpha=.05$ , *t* refers to the *t*-value in the *t*-test,  $\chi^2$  is the chi-square value, *p* is the *p*-value, range refers to the range of scores on each measure, the self-harm variable shows frequency data. % Y is the percentage of the group who reported self-harm behaviours, and % N is the percentage of the group who did not report self-harm behaviours. *p*-values are two-tailed.

**6.4.2.3. Correlation with Age.** Correlation analyses and *t*-tests were used to test if the key variables were associated with age, and the results are shown in Table 6.1. Age was significantly correlated with depressive symptoms, suicidal ideation, and self-harm behaviour. Specifically, depression and suicidal ideation decreased with age, and participants who engaged in self-harm were younger.

As reported in Section 5.4.6.3, age was also significantly correlated with sadness reappraisal, sadness distraction, and anger reappraisal, but not anger distraction, fear reappraisal, fear distraction, or gender. As age was correlated with several of the study variables, age was included as a covariate in the mediation analysis.

**6.4.2.4. Correlation Between the Variables Associated with Mental Health.** It is known in the literature that there are correlations between depression, self-harm behaviour, and suicidal ideation (De Beurs et al., 2020; Gilchrist & Sadler, 2019; Mars et al., 2019), and so this was also tested in the present research using correlation analysis and *t*-tests. The results of these tests are shown in Table 6.1. Depressive symptoms were positively correlated with suicidal ideation, and individuals who engaged in self-harm behaviours had significantly



higher levels of depressive symptoms, and suicidal ideation. Thus, there were significant correlations between the variables associated with mental health.

**6.4.2.5. Comparing the Mental Health of Student Participants to the Rest of the Sample.** Analyses were run on the variables associated with mental health to determine if there were differences between the student participants and the rest of the sample (government analysts and community members). The results are shown in Table 6.3. Students had higher levels of depressive symptoms and suicidal ideation and were more likely to report self-harm behaviours than the rest of the sample. However, there was no difference in wellbeing between the students and the rest of the sample.

**Table 6.3**

*T-Tests and Chi-Square Analysis Comparing Student Mental Health Scores With Rest of the Sample*

	Students		Rest of sample		Total		Range		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Min	Max		
Depressive symptoms	16.78	10.16	11.27	8.67	15.77	10.11	0.00	51.00	<b>3.38</b>	<b>.001</b>
Suicidal ideation	3.46	6.64	.97	4.49	3.00	6.37	0.00	36.00	<b>2.76</b>	<b>.01</b>
Wellbeing	47.30	8.83	49.32	6.89	47.67	8.53	14.00	70.00	<b>-1.31</b>	<b>.19</b>
	<b>% Y</b>	<b>% N</b>	<b>% Y</b>	<b>% N</b>	<b>% Y</b>	<b>% N</b>			$\chi^2$	<i>p</i>
Self-harm behaviour	34.94	65.06	10.81	89.19	30.54	69.46	-	-	<b>8.30</b>	<b>.004</b>

Note. Significant values at  $p < .05$  are shown in bold. All tests are two-tailed. % Y is the percentage of the group who reported self-harm behaviours, and % N is the percentage of the group who did not report self-harm behaviours.

### 6.4.3. Mediation Analysis

**6.4.3.1. Using Mediation Analysis When X Does Not Predict Y.** In terms of the implications of the lack of gender differences in the variables associated with mental health (reported in 6.4.2.3) in conducting mediation analysis, a logical assumption to make is that X must first have a significant effect on Y for a third variable M to mediate this effect. However, contemporary mediation theorists suggest that this is not the case, and there is a consensus amongst these theorists that finding a total effect of X on Y should not be a

prerequisite for testing a mediation effect (Bollen, 1989; Cerin & MacKinnon, 2009; Hayes, 2009, 2017; LeBreton, Wu, & Bing, 2009; MacKinnon, 2008; Rucker, Preacher, Tormala, & Petty, 2011; Shrout & Bolger, 2002; Zhao, Lynch Jr, & Chen, 2010).

As discussed in Section 6.3.2, it is possible for X to influence Y through M, even if the total effect of X on Y is found to be not significant using a hypothesis test (Hayes, 2017). Thus, the best test of a mediation effect is by testing the indirect effect itself, regardless of the total effect of X on Y (Hayes, 2017). As the Hayes (2017) method of mediation was used, this means that a mediation analysis could be run by testing the indirect effect, even in the absence of the total effect of gender (X) on depressive symptoms, suicidal ideation, or self-harm behaviour (Y) being significant, which was the case in the present study.

**6.4.3.2. Controlling for Covariates in the Mediation Models.** Three outcome variables were tested in the mediation models – depressive symptoms, suicidal ideation, and self-harm behaviour. In terms of covariance, there is evidence that these variables are correlated with one another to a degree. Depression is positively correlated with suicidal ideation and self-harm behaviour irrespective of suicidal intent (De Beurs et al., 2020; Gilchrist & Sadler, 2019; Hafferty et al., 2019; Kanwal & Aslam, 2015; Kessler, Berglund, Borges, Nock, & Wang, 2005; O'Connor, Rasmussen, & Hawton, 2010; O'Connor et al., 2009; Rasmussen et al., 2010; Wolford-Clevenger, Vann, & Smith, 2016). Similarly, there is a strong association between self-harm behaviours and suicidal ideation (Andover et al., 2012; Duarte et al., 2020; Klonsky, 2011; Mars et al., 2019; O'Connor et al., 2018). As reported in Section 6.4.2.4, these variables were also correlated in the present study. As there is evidence of correlations between depression, self-harm, and suicidal ideation, in each mediation model the other two variables are controlled for. For example, Model 1 is testing the relationship between gender, ER and depressive symptoms, and so self-harm behaviour and suicidal ideation are included as covariates in this model.

Furthermore, age has been found to play a role both in ER (Nolen-Hoeksema & Aldao, 2011; Zimmermann & Iwanski, 2014) and in mental health (Fiske et al., 2009; Hawton et al., 2012; Moran et al., 2012) in the literature. In the present study, age was found to correlate with a number of key variables, which was reported in Section 6.4.2.3. Therefore, age was also included as a covariate in the mediation models, to ensure that the effects found were not confounded by age.

It should be noted that including a large number of covariates in a regression model increases the risk of overfitting the model, which means that too much is being asked of the data given the number of observations in the study (Dalicandro, Harder, Mazmanian, & Weaver, 2021). In other words, this can occur when there are too few observations for the number of variables in the model (including the covariates). Overfitting can result in the findings of an analysis not being replicable in future studies, and so undermines the scientific accuracy of the findings (Babyak, 2004). However, as a rule of thumb, Babyak (2004) suggests 10 to 15 observations for each predictor variable as a minimum will allow for good estimates. As a more conservative rule, S. B. Green (1991) suggests a minimum of 50 for the overall sample size, with around 8 additional observations per predictor. For the present study, this would result in a sample size of 114 (50 for the original sample, and then 8 cases for each of the 8 predictors which is an additional 64). The present study comfortably meets this target sample size, and so it is unlikely that overfitting due to including multiple covariates will have occurred in this case.

#### 6.4.4. Main Analysis: Testing the Mediation Models

Mediation analysis was conducted using the PROCESS macro version 3.4.1 on SPSS version 24. The variables used in the mediation models are shown in Table 6.4. The results for the six mediation analyses are presented in the following sections.

**Table 6.4**

*Variables Used in the Mediation Analyses*

Statistical term	Variable
X	Gender
M <sub>1</sub>	Reappraisal/distraction effectiveness for sadness
M <sub>2</sub>	Reappraisal/distraction effectiveness for anger
M <sub>3</sub>	Reappraisal/distraction effectiveness for fear
Y	Depressive symptoms/suicidal ideation/self-harm behaviour
Covariates	Age, suicidal ideation, self-harm, depressive symptoms

**6.4.4.1. Model 1: Gender, Reappraisal, and Depressive Symptoms.** The first mediation model tested whether reappraisal effectiveness for sadness, anger and fear mediated the relationship between gender and depressive symptoms, while controlling for age, self-harm behaviour and suicidal ideation. During data screening, 3 outliers were identified and removed from further analysis. The regression coefficients and *p*-values for Model 1 can be found in Figure 6.1.

Firstly, suicidal ideation emerged as a significant covariate of depressive symptoms, with higher suicidal ideation being associated with higher depressive symptoms,  $b = .85$ ,  $t(190) = 9.33$ ,  $p < .001$ , 95% CI (.67, 1.03). Self-harm behaviour,  $b = 1.41$ ,  $t(190) = 1.10$ ,  $p = .27$ , 95% CI (-1.13, 3.95), and age,  $b = -.08$ ,  $t(190) = -1.26$ ,  $p = .21$ , 95% CI (-.19, .04), did not predict depressive symptoms in the model.

The total effect of gender on depressive symptoms was non-significant,  $b = -1.37$ ,  $t(193) = -1.22$ ,  $p = .22$ , 95% CI (-3.58, .84), which means that there were no significant

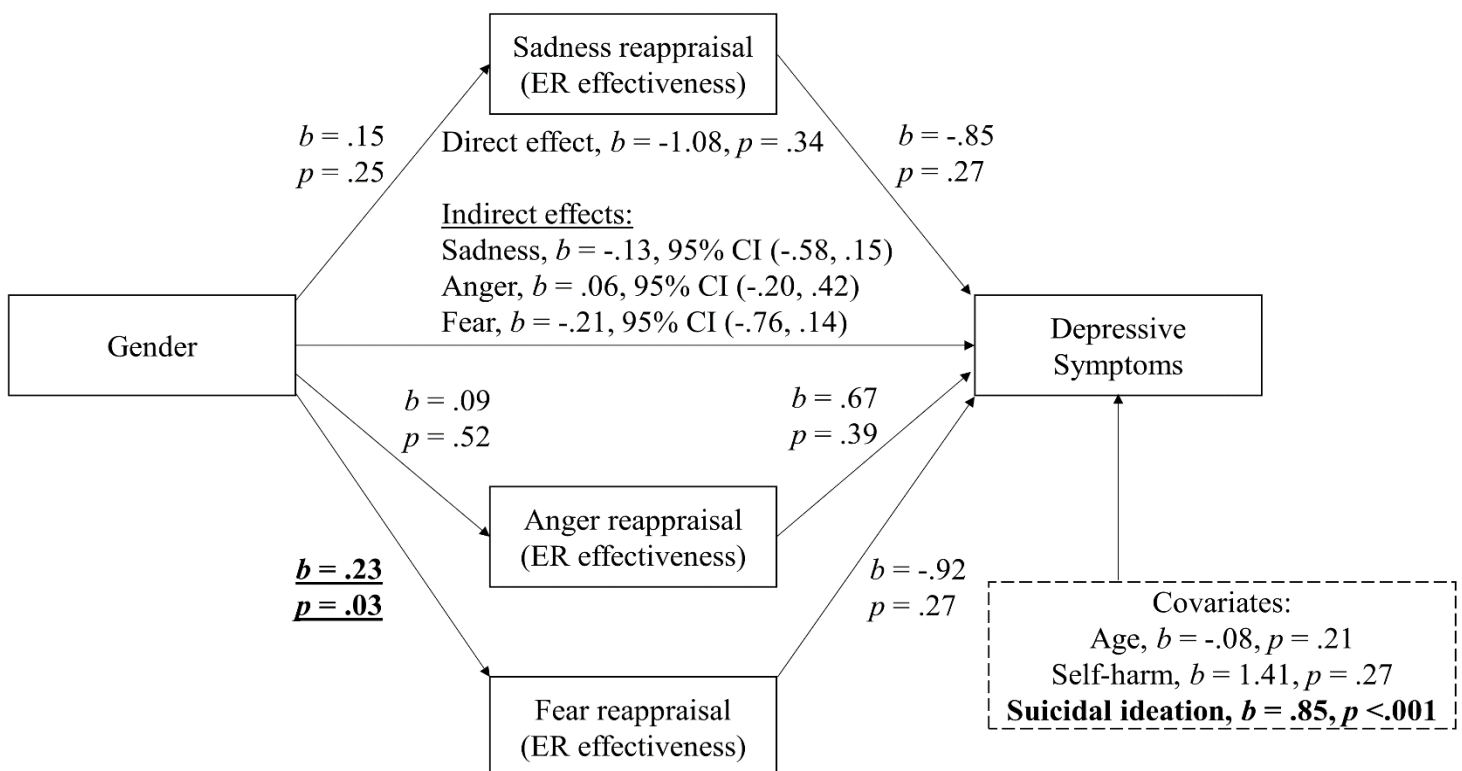
gender differences in depressive symptoms. In terms of the relationship between ER and depression, ER effectiveness for sadness,  $b = -.85$ ,  $t(190) = -1.10$ ,  $p = .27$ , 95% CI (-2.36, .67), anger,  $b = .67$ ,  $t(190) = .87$ ,  $p = .39$ , 95% CI (-.86, 2.20), and fear,  $b = -.92$ ,  $t(190) = -1.10$ ,  $p = .27$ , 95% CI (-2.57, .73), did not predict depressive symptoms.

When ER effectiveness for sadness, anger and fear were controlled for in the mediation model, gender was not associated with depressive symptoms,  $b = -1.08$ ,  $t(190) = -.95$ ,  $p = .34$ , 95% CI (-3.33, 1.16), which is the direct effect.

In terms of the mediation, no mediation effect was found for sadness,  $b = -.13$ , 95% CI (-.58, .15), anger,  $b = .06$ , 95% CI (-.20, .42), or fear,  $b = -.21$ , 95% CI (-.76, .14), as the confidence intervals all contained zero.

**Figure 6.1.**

*Mediation Model 1: Gender, Depressive Symptoms, and Reappraisal Effectiveness for Sadness, Anger, and Fear, Showing Unstandardised Regression Coefficients and P-Values of Each Path.*



Note. Significant values ( $p < .05$ ) are in bold and underlined.

**6.4.4.2. Model 2: Gender, Distraction, and Depressive Symptoms.** The second

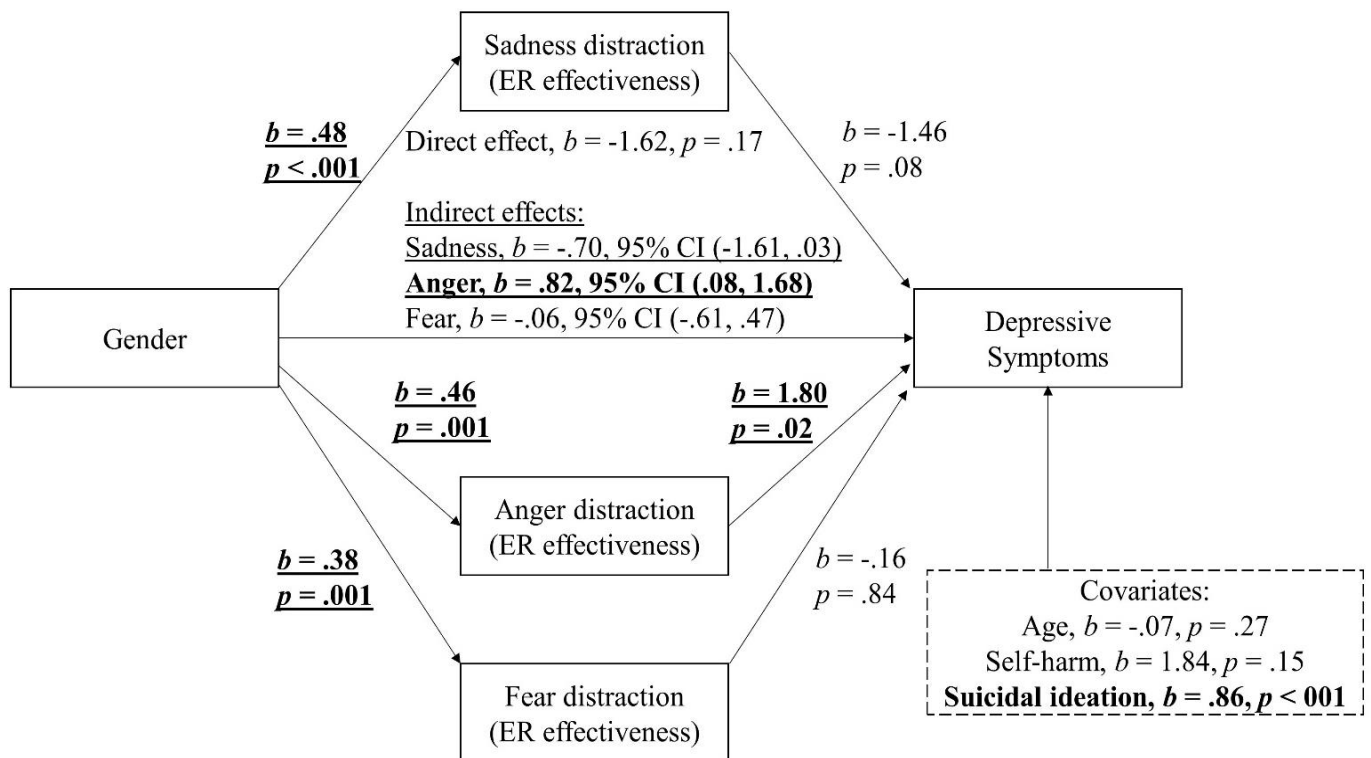
model tested distraction effectiveness for sadness, anger and fear as potential mediators in the relationship between gender and depressive symptoms, while controlling for age, self-harm behaviour, and suicidal ideation. During data screening, 1 outlier was identified and removed from further analysis. The regression coefficients and *p*-values can be found in Figure 6.2.

As with Model 1, suicidal ideation,  $b = .86$ ,  $t(192) = 9.45$ ,  $p < .001$ , 95% CI (.68, 1.04), but not self-harm behaviour,  $b = 1.84$ ,  $t(192) = 1.45$ ,  $p = .15$ , 95% CI (-.67, 4.34), or age,  $b = -.07$ ,  $t(192) = -1.12$ ,  $p = .27$ , 95% CI (-.18, .05), was associated with depressive symptoms.

The total effect of gender on depressive symptoms was non-significant,  $b = -1.55$ ,  $t(195) = -1.38$ ,  $p = .17$ , 95% CI (-3.77, .66). When distraction effectiveness for sadness, anger, and fear

**Figure 6.2.**

*Mediation Model 2: Gender, Depressive Symptoms, and Distraction Effectiveness for Sadness, Anger, and Fear, Showing Unstandardised Regression Coefficients and P-Values of Each Path.*



Note. Significant values ( $p < .05$ ) are in bold and underlined.

were controlled for in the model (i.e., the direct effect), gender was not associated with depressive symptoms,  $b = -1.62$ ,  $t(192) = -1.38$ ,  $p = .17$ , 95% CI (-3.92, .69).

A mediation effect was found in Model 2. Distraction effectiveness for anger mediated the effect of gender on depressive symptoms,  $b = .82$ , 95% CI (.08, 1.68).

Specifically, relative to males, females had higher distraction effectiveness for anger,  $b = .46$ ,  $t(195) = 3.34$ ,  $p = .001$ , 95% CI (.19, .73), and higher distraction effectiveness for anger was associated with higher depressive symptoms,  $b = 1.80$ ,  $t(192) = 2.41$ ,  $p = .02$ , 95% CI (.33, 3.27).

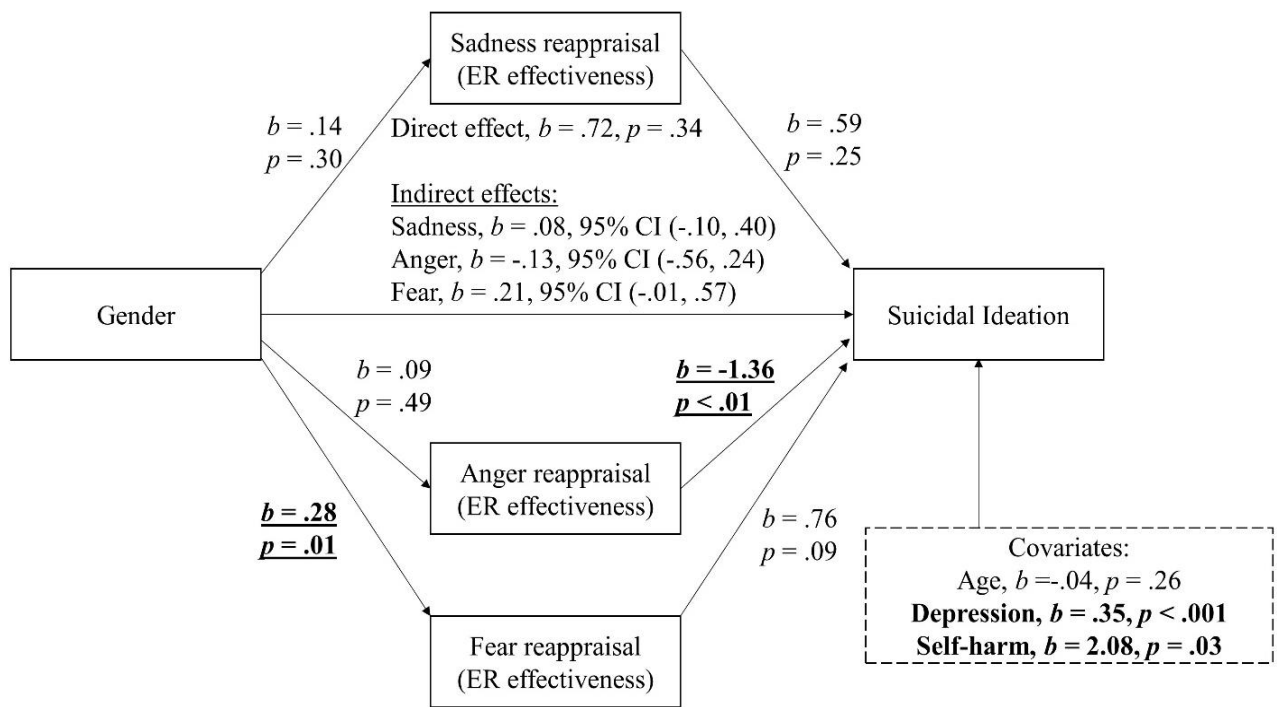
**6.4.4.3. Model 3: Gender, Reappraisal, and Suicidal Ideation.** Model 3 tested whether reappraisal effectiveness for sadness, anger, and fear mediated the relationship between gender and suicidal ideation, while controlling for age, depressive symptoms, and self-harm behaviour. During data screening, 3 outliers were identified and removed from further analysis. There was evidence of heteroscedasticity in the data, and so a heteroscedastic-resistant estimator was used in PROCESS, HC-3 (Hayes, 2017). The regression coefficient and  $p$ -values of Model 3 can be found in Figure 6.3.

Depressive symptoms,  $b = .35$ ,  $t(190) = 5.09$ ,  $p < .001$ , 95% CI (.21, .48), and self-harm,  $b = 2.08$ ,  $t(190) = 2.19$ ,  $p = .03$ , 95% CI (.21, 3.96), but not age,  $b = -.04$ ,  $t(190) = -1.13$ ,  $p = .26$ , 95% CI (-.10, .03), predicted suicidal ideation. Specifically, higher depressive symptoms and self-harm were associated with higher suicidal ideation. The total effect of gender on suicidal ideation was non-significant,  $b = .89$ ,  $t(193) = 1.14$ ,  $p = .26$ , 95% CI (-.65, 2.43), which means that there were no significant gender differences in suicidal ideation. In terms of ER, higher reappraisal effectiveness for anger (i.e., lower anger after using reappraisal) was associated with lower suicidal ideation,  $b = -1.36$ ,  $t(190) = -2.90$ ,  $p = .004$ , 95% CI (-2.29, -.44).

No mediation effects were found for the change in sadness,  $b = .08$ , 95% CI (-.10, .40), anger,  $b = -.13$ , 95% CI (-.56, .24), or fear,  $b = .21$ , 95% CI (-.01, .57), after using reappraisal. When the reappraisal effectiveness for sadness, anger, and fear were controlled for (i.e., the direct effect), gender was not associated with suicidal ideation,  $b = .72$ ,  $t(190) = .95$ ,  $p = .34$ , 95% CI (-.78, 2.22).

**Figure 6.3.**

*Mediation Model 3: Gender, Suicidal Ideation, and Reappraisal Effectiveness for Sadness, Anger, and Fear, Showing Unstandardised Regression Coefficients and P-Values of Each Path.*



*Note.* Significant values ( $p < .05$ ) are in bold and underlined.

**6.4.4.4. Model 4: Gender, Distraction, and Suicidal Ideation.** Model 4 tested whether the distraction effectiveness for sadness, anger, and fear mediated the relationship between gender and suicidal ideation, while controlling for age, depressive symptoms, and self-harm behaviour. During data screening, 5 outliers were identified and removed from further analysis. There was evidence of heteroscedasticity in the data, and so a



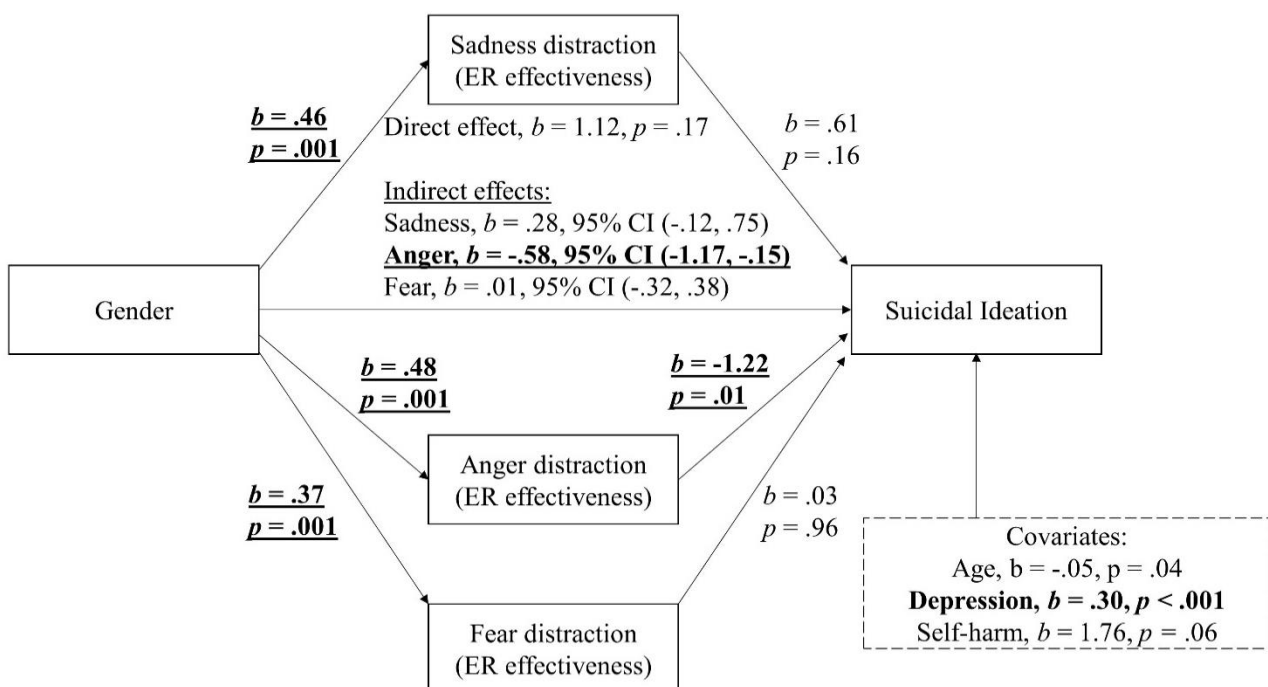
heteroscedastic-resistant estimator was used in PROCESS, HC-3 (Hayes, 2017). The regression coefficient and  $p$ -values can be found in Figure 6.4.

Depression,  $b = .30$ ,  $t(188) = 4.55$ ,  $p < .001$ , 95% CI (.17, .43), and age,  $b = -.05$ ,  $t(188) = -2.07$ ,  $p = .04$ , 95% CI (-.10, -.002), but not self-harm,  $b = 1.76$ ,  $t(188) = 1.87$ ,  $p = .06$ , 95% CI (-.10, 3.61), emerged as significant predictors of suicidal ideation. Specifically, higher depressive symptoms were associated with higher suicidal ideation, and being older was associated with lower suicidal ideation. The total effect of gender on suicidal ideation was non-significant,  $b = .83$ ,  $t(191) = 1.08$ ,  $p = .28$ , 95% CI (-.69, 2.35).

One mediation effect was found. The distraction effectiveness for anger mediated the relationship between gender and suicidal ideation,  $b = -.58$ , 95% CI (-1.17, -.15). Specifically, compared to males, females had higher distraction effectiveness for anger,  $b = .48$ ,  $t(191) = -3.48$ ,  $p = .001$ , 95% CI (-.73, -.20), and higher distraction effectiveness for anger was

**Figure 6.4.**

*Mediation Model 4: Gender, Suicidal Ideation, and Distraction Effectiveness for Sadness, Anger, and Fear, Showing Unstandardised Regression Coefficients and P-Values of Each Path.*



Note. Significant values ( $p < .05$ ) are in bold and underlined.

associated with lower suicidal ideation,  $b = -1.22$ ,  $t(188) = -2.73$ ,  $p = .01$ , 95% CI (-2.11, -.34). Distraction effectiveness for sadness,  $b = .28$ , 95% CI (-.12, .75), and fear,  $b = .01$ , 95% CI (-.32, .38), did not mediate the relationship between gender and suicidal ideation. In terms of the direct effect, when the change in sadness, anger, and fear were controlled for, gender was not significantly associated with suicidal ideation,  $b = 1.12$ ,  $t(188) = 1.38$ ,  $p = .17$ , 95% CI (-.49, 2.72).

**6.4.4.5. Model 5: Gender, Reappraisal, and Self-Harm Behaviour.** Model 5 tested whether reappraisal effectiveness for sadness, anger and fear mediated the relationship between gender and engaging in self-harm behaviour. As self-harm behaviour was a dichotomous variable (Yes, No), the mediation model was tested using binomial logistic regression, with age, depressive symptoms, and suicidal ideation as covariates. During data screening, 2 outliers were identified and removed from further analysis. The regression coefficient and  $p$ -values can be found in Figure 6.5.

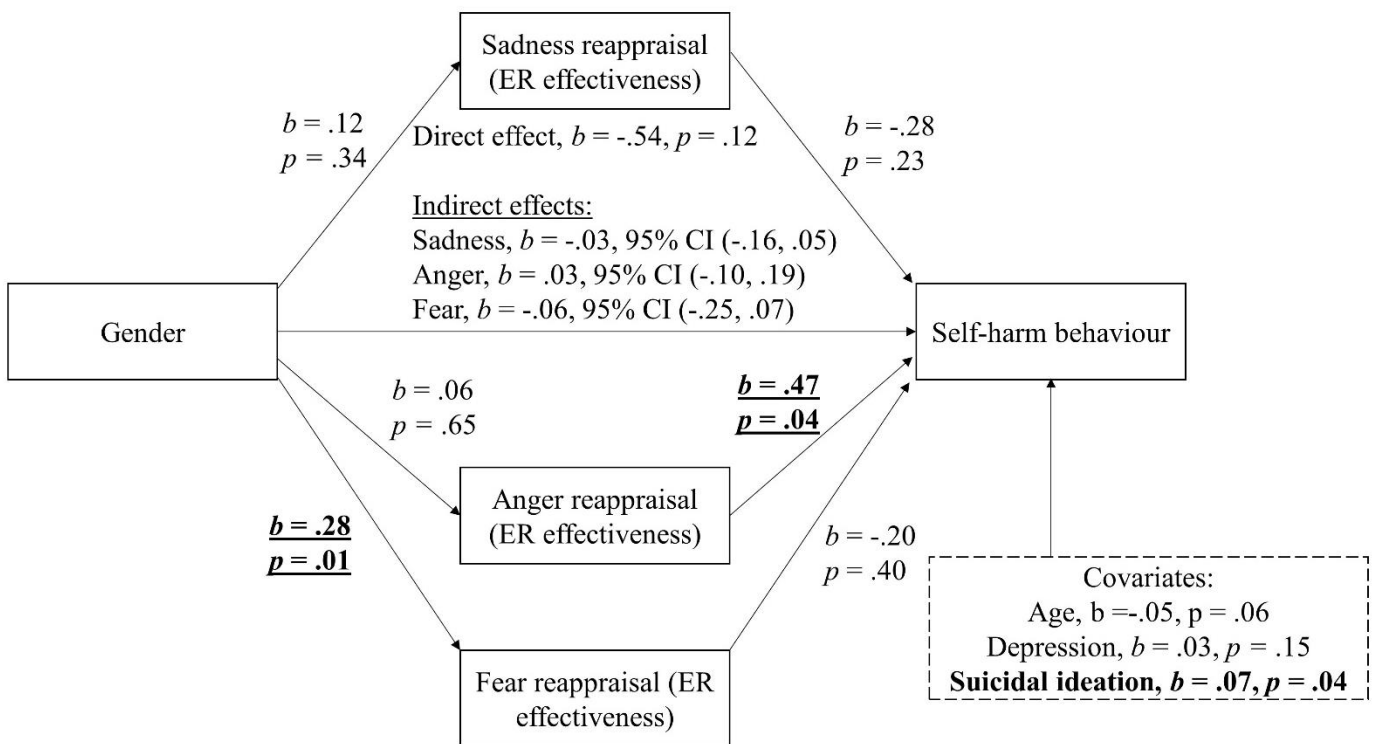
Firstly, suicidal ideation emerged as a significant predictor of self-harm behaviour,  $b = .07$ , 95% CI (.003, .13),  $z = 2.04$ ,  $p = .04$ , with higher suicidal ideation being associated with engaging in self-harm. Depressive symptoms,  $b = .03$ , 95% CI (-.01, .07),  $z = 1.43$ ,  $p = .15$ , and age,  $b = -.05$ , 95% CI (-.09, .002),  $z = -1.88$ ,  $p = .06$ , were not associated with self-harm behaviour.

No mediation effects were found. The change in sadness,  $b = -.03$ , 95% CI (-.16, .05), anger,  $b = .03$ , 95% CI (-.10, .19), and fear,  $b = -.06$ , 95% CI (-.25, .07), after using reappraisal did not mediate the relationship between gender and self-harm behaviour. When the change in sadness, anger, and fear after using reappraisal was controlled for (i.e., the direct effect), gender was not associated with self-harm behaviour,  $b = -.54$ , 95% CI (-1.22, .14),  $z = -1.57$ ,  $p = .12$ .

In terms of the impact of ER on self-harm, higher reappraisal effectiveness for anger was associated with engaging in self-harm behaviour  $b = .47$ , 95% CI (.02, .93),  $z = 2.03$ ,  $p = .04$ . Reappraisal effectiveness for sadness,  $b = -.28$ , 95% CI (-.73, .18),  $z = -1.19$ ,  $p = .23$ , and fear,  $b = -.20$ , 95% CI (-.69, .28),  $z = -.83$ ,  $p = .40$ , were not associated with engaging in self-harm behaviour.

**Figure 6.5.**

*Mediation Model 5: Gender, Self-harm Behaviour, and Reappraisal Effectiveness for Sadness, Anger, and Fear, Showing Unstandardised Regression Coefficients and P-Values of Each Path.*



Note. Significant values ( $p < .05$ ) are in bold and underlined.

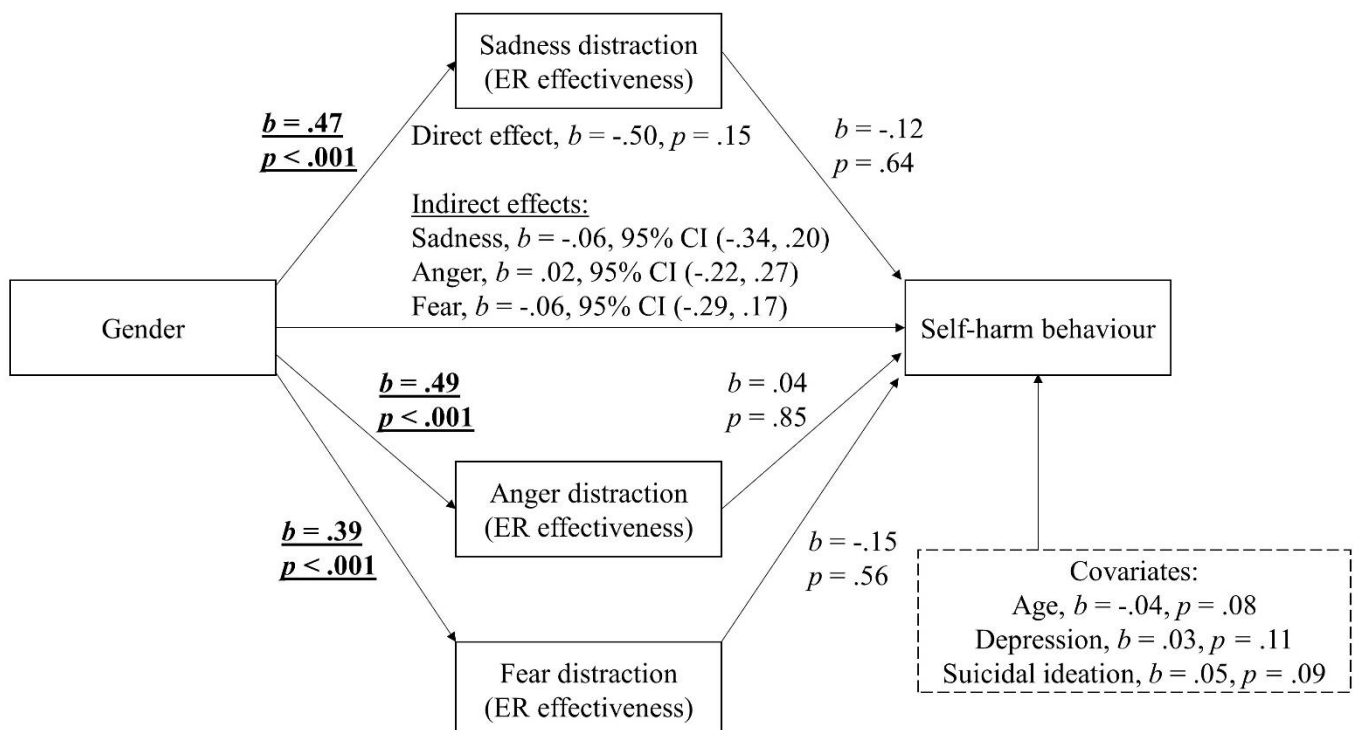
**6.4.4.6. Model 6: Gender, Distraction, and Self-Harm Behaviour.** Model 6 tested whether distraction effectiveness for sadness, anger and fear mediated the relationship between gender and engaging in self-harm behaviour. The mediation model was tested using binomial logistic regression, with age, depressive symptoms, and suicidal ideation as covariates. During data screening, 2 outliers were identified and removed from further analysis. The regression coefficient and  $p$ -values can be found in Figure 6.6.

In terms of covariates, suicidal ideation,  $b = .05$ , 95% CI (-.01, .12),  $z = 1.68$ ,  $p = .09$ , depressive symptoms,  $b = .03$ , 95% CI (-.01, .07),  $z = 1.60$ ,  $p = .11$ , and age,  $b = -.04$ , 95% CI (-.09, .004),  $z = -1.78$ ,  $p = .08$ , were not associated with self-harm behaviour.

No mediation effects were found in this analysis. Distraction effectiveness for sadness,  $b = -.06$ , 95% CI (-.34, .20), anger,  $b = .02$ , 95% CI (-.22, .27), and fear,  $b = -.06$ , 95% CI (-.29, .17), did not mediate the relationship between gender and self-harm behaviour. In terms of the direct effect, when the change in sadness, anger, and fear using distraction was controlled for, gender was not associated with self-harm behaviour,  $b = -.50$ , 95% CI (-1.19, .19),  $z = -1.43$ ,  $p = .15$ .

**Figure 6.6.**

*Mediation Model 6: Gender, Self-harm Behaviour, and Distraction Effectiveness for Sadness, Anger, and Fear, Showing Unstandardised Regression Coefficients and P-Values of Each Path.*



*Note.* Significant values ( $p < .05$ ) are in bold and underlined

## 6.5. Discussion

### 6.5.1. Results of Study 2b

The regulation of some specific emotions were associated with gender differences in some (but not all) of the variables associated with mental health, but this depended on the strategy being used, the specific emotion being regulated, and the variable associated with mental health. The results are summarised in Table 6.5.

**Table 6.5**

*Evidence for Study 2b*

Research Questions	Evidence
SRQ1. Are there gender differences in the reporting of depressive symptoms, self-harm behaviours, and suicidal ideation?	<ul style="list-style-type: none"><li>• No gender differences were found for depressive symptoms, self-harm behaviours, or suicidal ideation.</li></ul>
SRQ2. Is there a relationship between gender, emotion-specific ER effectiveness and variables associated with mental health?	<ul style="list-style-type: none"><li>• The regulation of anger using distraction was associated with the relationship between gender and depressive symptoms/suicidal ideation.</li><li>• Females had a larger reduction in anger using distraction, and this was associated with higher depressive symptoms and lower suicidal ideation.</li><li>• An association was found for anger only, not for sadness or fear.</li><li>• An associated was found for distraction only, not for reappraisal.</li></ul>

### 6.5.2. The Relationship Between Gender and Variables Associated With Mental Health

The total effects in the mediation models demonstrated that there were no gender differences in depressive symptoms, suicidal ideation, or self-harm behaviour. These findings are generally not consistent with the depression and suicidal literatures, which tend to find

that females report higher levels of depression (H. Chen et al., 2019; Eaton et al., 2012; Girgus & Yang, 2015; Hankin et al., 1998; Kessler, 2003; Kunst et al., 2019; Marcus et al., 2005; Nolen-Hoeksema, 1987, 2001; Nolen-Hoeksema & Aldao, 2011; Nolen-Hoeksema et al., 1999; Van de Velde et al., 2010; Weissman et al., 1996; Wetherall et al., 2020), self-harm behaviour (Hawton et al., 2012; Madge et al., 2008; O'Connor et al., 2009), and suicidal ideation (Barzilay et al., 2019; Lu et al., 2020; Stephenson et al., 2006).

**6.5.2.1. Depressive Symptoms.** There is some evidence that gender differences in depression are not always observed amongst undergraduate populations (Gladstone & Koenig, 1994; Grant et al., 2002; R. Nolan & Willson, 1994; Stangler & Printz, 1980). The present study had a high proportion (82%) of undergraduate students, and so it is possible that gender differences are less prominent in this population. In the present study, it was not the case that females had lower levels of depression compared to other studies which have used the CES-D with a similar population, such as Flett et al. (2014), but rather males had relatively higher levels of depressive symptoms, and so this might account for the decreased difference between males and females. Entering higher education can represent a time of increased stress and turbulence for individuals, and a study by Gladstone and Koenig (1994) found that social support protected males from increased depression in university. It should also be noted that gender differences in depression amongst university students using the CES-D differs by culture, and this relationship is more common amongst Western cultures compared to Eastern cultures (Kwon et al., 2013).

Another reason for this finding may be the way depression is measured and conceptualised. In a study by Grant et al. (2002), no gender differences were found amongst undergraduate students when using a self-report measure of depressive symptoms. However, when depressive disorder was measured through an interview with a clinical psychologist, males had higher rates of depressive disorder (Grant et al., 2002). This indicates that when a

clinical interview is used, the traditional pattern of gender differences in depression may actually be reversed amongst undergraduates, with males having higher rates of depression than females. It also demonstrates that self-report measures of depressive symptoms (such as that used in the present study) may not be sensitive enough to find gender differences in depression amongst undergraduate students, if these gender differences exist.

However, it should also be noted that a significant indirect effect emerged in one of the mediation models for depression, which will be discussed in more detail below. This significant indirect effect indicates that gender was associated with depression through the mediator of anger distraction. That is to say, females had a greater reduction in anger using distraction, and this was associated with higher depressive symptoms. These higher depressive symptoms for females (through the mediation effect) are consistent with the gender differences found in the literature (H. Chen et al., 2019; Eaton et al., 2012; Girgus & Yang, 2015; Hankin et al., 1998; Kessler, 2003; Kunst et al., 2019; Marcus et al., 2005; Nolen-Hoeksema, 1987, 2001; Nolen-Hoeksema & Aldao, 2011; Nolen-Hoeksema et al., 1999; Van de Velde et al., 2010; Weissman et al., 1996; Wetherall et al., 2020). These results may indicate that mechanisms of depression may differ for males and females.

**6.5.2.2. Self-Harm Behaviour and Suicidal Ideation.** Similarly, there were no gender differences in either suicidal ideation or self-harm behaviour. This was unexpected as it is generally inconsistent with the broader literature, which has shown that females tend to have higher rates of self-harm behaviour irrespective of intent (Hawton et al., 2012; C. S. Lee & Wong, 2020; Lewinsohn et al., 2001; Madge et al., 2008; O'Connor et al., 2009; Sivertsen et al., 2019; Wetherall et al., 2018) and suicidal ideation (Hunt et al., 2006; C. S. Lee & Wong, 2020; Sivertsen et al., 2019; Stephenson et al., 2006), although more males die by suicide (National Records of Scotland, 2021). One Scottish study found that more males than

females reported suicidal ideation, although females were more likely to attempt suicide (Wetherall et al., 2018).

One explanation for the findings of the present study is that some studies which have found prominent gender differences in self-harm, such as Madge et al. (2008), tend to emphasise behaviours which are more commonly engaged in by females, such as cutting and self-poisoning (D. Casey et al., 2020; Lundh et al., 2007). Males, on the other hand, are more likely to use burning or hitting behaviours to self-harm (Andover et al., 2010; Idig-Camuroglu & Gölge, 2018; Sornberger et al., 2012). The measure of self-harm used in the present study, the DSHI (Gratz, 2001), was chosen because it directly measures a wide range of self-harm behaviours which are commonly used by both females and males, and so would be more likely to detect a gender difference if one exists, regardless of the specific method used by the individual. It may be the case that this measure reduced any potential gender bias in responding, and so the difference between males and females in self-harm behaviour disappeared.

In the Scottish Health Survey (Knudson et al., 2020) participants were asked whether they 'have ever self-harmed in any way but not with the intention of killing themselves'. This measure asked about any method of self-harm, and gender differences emerged, with a higher percentage of females than males reporting self-harm behaviours, which is in contrast to the findings of the present study. However, the difference between this approach and the measure used in the present study (DSHI) is that the DSHI offers specific instances of methods that are commonly used by females (e.g., cutting) and males (e.g., burning). This may mean that even if a participant did not define their behaviour as self-harm, or did not offer this information without being prompted, they may still report this on the DSHI, but not in the Scottish Health Survey measure (Knudson et al., 2020). Therefore, it is likely that the DSHI reduced gender bias in the measurement of self-harm behaviours.



Another explanation is that the development of self-harm behaviours is different for males and females, which may result in the gender gap changing with age and becoming less prominent in adulthood (or disappearing entirely). Many of the reported gender differences in self-harm come from studies conducted with adolescents (De Leo & Heller, 2004; Hawton et al., 2002; Hawton et al., 2012; Lundh et al., 2007; Madge et al., 2008; O'Connor et al., 2009). Self-harm behaviours tend to decrease with age (Hawton et al., 2012), and are least prevalent in older age groups (McManus et al., 2019). There is also evidence that the gender gap decreases across adolescence, with self-harming behaviours becoming increasingly common in males and remaining stable in females (Boeninger et al., 2010; Hawton et al., 2003; Hawton et al., 2012), and some studies showing that self-harming behaviours decrease as females (but not males) get older (C. Q. Li et al., 2020).

As the present study was conducted with adults, it is possible that the gender difference has declined enough to be statistically non-significant by adulthood. However, a meta-analysis by Bresin and Schoenleber (2015) found that gender differences (with females reporting higher levels of self-harm) did not change across age groups, although the majority of studies included in the analysis were conducted in the US. This study also demonstrated that gender differences tend to be smaller in undergraduate and community samples (compared to a clinical sample), and when self-report measures of self-harm are used (compared to a clinical interviews) (Bresin & Schoenleber, 2015), which may also contribute to the absence of a gender effect in the present study. Although the findings of the present study are not consistent with the literature more generally, they do mirror the findings of Gratz et al. (2002), who used the same measure of self-harm as that used in the present study (DSHI) with an undergraduate sample and found no gender differences.

In terms of suicidal ideation, much of the previous research was conducted with adolescents (Barzilay et al., 2019; Reinherz et al., 1995; Reinherz et al., 2006), and often in

East Asian countries such as China (Lu et al., 2020), South Korea (Kim et al., 2014), and Taiwan (Chiu et al., 2017), which may have cultural differences compared to the present study, which was conducted in Scotland. In a study by O'Connor et al. (2018) conducted with adults in the UK (similar to the present study), no gender difference in suicidal ideation was found. Further, in a Scottish study with young adults, males were found to report having suicidal thoughts more than females, which may indicate that males have higher suicidal ideation in Scotland (although females were more likely to report taking action on these thoughts) (Wetherall et al., 2018) Therefore, age and culture may moderate these gender differences in suicidal ideation.

However, as with depression, although the total effect of gender on suicidal ideation was not statistically significant, when ER was included as a mediator, a significant effect emerged through this mediator. Specifically, females had a larger reduction in anger after using distraction, this was associated with lower suicidal ideation. This finding indicates that females have lower suicidal ideation, through the mediator of anger distraction. Therefore, although there were no gender differences in suicidal ideation overall, when mediators were included in the model, evidence of gender differences emerged.

### ***6.5.3. The Relationship Between Gender, Distraction of Anger, and Depression***

The change in anger using distraction was associated with gender differences in depressive symptoms. Compared to males, females had a larger reduction in anger using distraction, and this was correlated with higher depressive symptoms. This indicates that females were more effective than males at reducing anger using distraction, but this was associated with higher depression.

The present findings demonstrate that distraction is an effective strategy for decreasing feelings of anger in an experimental setting, which is in line with the literature

(Rusting & Nolen-Hoeksema, 1998). Furthermore, it indicates that females may be more effective at reducing anger. There is evidence that females receive cultural messages that anger is inappropriate to express (Root & Denham, 2010), and so females may be more practiced at distracting from anger to avoid negative social consequences (Brescoll & Uhlmann, 2008). This finding is consistent with a study by Rusting and Nolen-Hoeksema (1998), who found that females were more likely to distract from an angry mood compared to a neutral mood, but this was not found for males.

Alternatively, the gender difference in distraction from anger could result from females having higher levels of anger at baseline compared to males, which would provide more of an opportunity to reduce this emotion for females. However, the *t*-test reported in Section 5.4.4.2 showed that there was no difference in anger in the no regulation condition between males and females in the present study (which may give an idea of baseline levels of emotion when ER strategies have not been instructed to be used), which lends support to the argument that females are more effective at distracting from anger.

The results of this model may highlight an important mechanism for explaining the gender differences in depression. Although at face value, the total effect of gender on depressive symptoms ( $X \rightarrow Y$ ) was not statistically significant, when the ER variables were included, the change in anger after using distraction emerged as a significant mediator. This means that gender was associated with depressive symptoms through the mediator of anger distraction. Although there are many contributing factors to the gender difference in depression (Nolen-Hoeksema, 1987; Nolen-Hoeksema et al., 1999), these findings may highlight anger distraction as one possible mechanism for the higher rates of depression observed amongst females.

As reported in Section 2.3.4, according to Response Styles Theory (RST), females are more likely to ruminate, and males are more likely to distract from a low mood, and this

contributes to females' higher rates of depression (Nolen-Hoeksema et al., 1999). The evidence is generally supportive of gender differences in rumination (D. P. Johnson & Whisman, 2013), and distraction (Gomez-Baya et al., 2016; Trives et al., 2016). However, the findings of the present study are somewhat inconsistent with the distraction tenet of RST (that males are more likely to use distraction, and this has an adaptive relationship with depression).

The association between effective use of distraction and higher depressive symptoms is contrary to what would be expected, as distraction is often regarded as an adaptive strategy in the literature (E. L. Davis et al., 2016; Hermann et al., 2017; Polanco-Roman et al., 2015; Smoski et al., 2014; Webb et al., 2012), although few studies have examined distraction within the context of anger. Whether distraction can be regarded as adaptive or maladaptive depends on how it is used. A study by Wolgast and Lundh (2017) found that when distraction is approached with an attitude of acceptance towards negative emotions, rather than to avoid the experience of emotion, it is associated with greater wellbeing. On the other hand, depressed people are more likely to use distraction in an attempt to avoid negative emotion (Wolgast & Lundh, 2017). Therefore, distraction may be maladaptive within the context of depression, particularly if it is used in such a way as to avoid negative emotions (such as anger).

In terms of previous studies on general emotion, a greater reduction in negative emotion using distraction during the ERT was associated with higher depressive symptoms amongst depressed individuals (Smoski et al., 2014), which suggests that the use of distraction in this context is maladaptive, in line with the findings of present study. In addition, experiencing higher levels of anger in general is associated with depressive symptoms (Abdolmanafi et al., 2011), and with greater use of maladaptive strategies such as rumination and catastrophising, which in turn may be associated with higher depressive

symptoms (Besharat et al., 2013). Interestingly, ruminating on anger is also associated with higher depressive symptoms (du Pont et al., 2018). It is possible that both ruminating on and distracting from anger are maladaptive within this context, and an approach which involves addressing anger without ruminating on it may be the most adaptive path.

Another potential explanation for the negative correlation between anger distraction and depressive symptoms is that anger suppression was involved. There is evidence that suppressing anger may be associated with higher levels of depression (Allan & Gilbert, 2002; Besharat et al., 2013; C. L. Brody et al., 1999; Cheung & Park, 2010; Duckro et al., 1995; R. C. Martin & Dahlen, 2005; Sperberg & Stabb, 1998). During the ERT, participants were asked to think of something unrelated to the situation depicted in the task (i.e., use distraction) but it is possible that some participants may have suppressed their feelings of anger during the task, particularly if they are familiar with using suppression. Females may be more likely to suppress their anger, at least in some contexts (Cox et al., 2000; Fischer & Evers, 2011; Kwon et al., 2013; Sharkin, 1993), and so this could explain why females had a larger reduction in anger, which was related to higher depressive symptoms.

An interesting direction for future research is to examine the causal relationships between gender, emotion-specific ER, and variables associated with mental health using a prospective study design. Distraction as a way of coping with anger may lead to higher depressive symptoms over time and may partially explain females' higher rates of depression. On the other hand, individuals with depression may turn to distraction as a more efficient way of regulating their feelings of anger, as distraction is a less effortful method of regulating emotions, at least within the context of sadness (Sheppes et al., 2009; Sheppes & Meiran, 2008). In a study by Smoski et al. (2014) older adults with a diagnosis of depression were more effective at reducing negative emotion with distraction during the ERT compared to individuals without depression, which would support the hypothesis that depressed

individuals gravitate towards using distraction. Therefore, prospective studies will be useful in assessing the causal impact of these variables in an emotion-specific manner.

#### ***6.5.4. The Relationship Between Gender, Distraction of Anger, and Suicidal Ideation***

The change in anger after using distraction was associated with gender differences in suicidal ideation. Specifically, females had a larger reduction in anger using distraction, and this was associated with lower suicidal ideation. Notably, the reduction in anger using distraction had a different relationship with depression and suicidal ideation, as it was associated with higher depressive symptoms, but lower suicidal ideation.

Generally speaking, using distraction to cope with a negative mood is associated with lower odds of engaging in self-harm behaviours with or without suicidal intent (Polanco-Roman et al., 2015). In a study by Stanley et al. (2021), the intuitive ways that individuals regulate their emotions in their daily lives were measured using ecological momentary assessment (EMA) amongst individuals with a diagnosis of a mood disorder and borderline personality disorder. Reporting intuitively using distraction or positive activities such as keeping busy, socialising, positive thinking, and doing something good for self as ER strategies was associated with less intense suicidal ideation (Stanley et al., 2021). This finding is in line with the present study, which found that more effective distraction for anger was associated with lower suicidal ideation. However, it should be noted that in Stanley et al. (2021) behavioural distraction was measured (i.e., doing things to distract yourself), and in particular these were behaviours which have adaptive connotations (e.g., doing something good for self), rather than more maladaptive distraction behaviours such as substance use. On the other hand, it was the use of cognitive distraction that was measured in the present study, which involves removing the attention from an emotional stimulus during the ERT.

Nonetheless, the results of the present study and Stanley et al. (2021) indicate that distraction may be adaptively associated with lower suicidal ideation, either by cognitively

removing attention from an emotional stimulus, or distracting oneself from an emotional situation through engaging in an unrelated behaviour. An explanation for this may come from Gross's (1998) process model of ER. According to this model (and appraisal theories that this model is derived from, as reported in Section 1.2.2.3), we pay attention to an emotional situation (attentional deployment), and then have an appraisal of the situation, which leads to an emotional response Gross (1998). Suicidal ideation may be understood as an extreme appraisal of a situation (i.e., it is thoughts about suicide). Distraction may be an effective strategy which is associated with lower suicidal ideation, because it intervenes at the attentional deployment stage of the process model, which appears before the appraisal stage. This means that the attention is removed from the emotional situation, before the suicidal thoughts have had the chance to appear, and thus distraction would be helpful in reducing suicidal ideation according to this framework. The present study builds on the findings of Stanley et al. (2021), by demonstrating that distraction may be helpful for suicidal thoughts within the context of anger regulation, rather than just within the context of general coping with distress as measured in Stanley et al. (2021). Additionally, the findings of the present study may also indicate that distraction from sadness and fear do not have a relationship with suicidal ideation, and therefore distraction may be a less effective strategy for reducing suicidal ideation within these emotional contexts.

However, there are very few studies which examine how distraction as an ER strategy is related to suicidal ideation within the context of anger specifically. There is evidence that experiencing anger as an emotional state may be related to the development of suicidal ideation (Goldney et al., 1997; Hawkins & Cogle, 2013; Hawkins et al., 2014), and problematic anger predicts suicidal ideation and suicidal attempts over time (Dillon et al., 2020). These findings demonstrate that being unable to effectively regulate feelings of anger may lead to having thoughts about suicide. It should be noted however that in the present

study it is not problematic anger that was measured, but rather the regulation of anger (using distraction and reappraisal) which was induced in a laboratory setting using emotionally evocative stimuli. This finding indicates that having the ability to effectively reduce anger using distraction is related to lower suicidal ideation.

In relation to gender differences, this mediation effect is somewhat surprising because females traditionally report higher levels of suicidal ideation in the literature (Barzilay et al., 2019; Lu et al., 2020; Stephenson et al., 2006). However, the findings from this model may highlight a mechanism through which females could reduce suicidal ideation, as anger distraction was associated with lower levels of suicidal ideation, and females could more effectively reduce anger during the ERT. It is interesting that distracting from anger was related to suicidal ideation, but this was not the case for the regulation of sadness or fear during the task, implicating anger-inducing situations as being involved in suicidal ideation.

It is also notable that the regulation of anger using distraction has opposing relationships with depression and suicidal ideation. Anger distraction was associated with higher depressive symptoms, but with lower suicidal ideation. This may highlight that whether or not a strategy can be considered adaptive depends on the context, including the emotional context. It may be the case that distracting from feelings of anger may be adaptive for those who are predisposed to having suicidal thoughts but may be less adaptive within the context of depression. The process of distraction may help to distract from suicidal thoughts, as this has been reported as a common strategy to cope with suicidal thoughts (Simon et al., 2016), but it may be the case that a consequence of this distraction is a negative relationship with depressive symptoms (Smoski et al., 2014).



### ***6.5.5. Reappraisal of Anger, Self-Harm Behaviour, and Suicidal Ideation***

Although there was no mediation effect, two interesting findings that emerged from the analyses were regarding the use of reappraisal to regulate anger. Firstly, a reduction in anger using reappraisal was associated with engaging in self-harm. However, a reduction in anger using reappraisal was also associated with lower suicidal ideation.

The suicidal ideation finding is consistent with previous research, which has found that the use of reappraisal is associated with lower suicidal ideation (Forkmann et al., 2014), and individuals with a history of suicidal ideation were less effective at using reappraisal during an experiment (Kudinova et al., 2016). Reappraisal involves cognitively changing negative thoughts about a situation (Gross, 1998a), and so this skill may also be applied to thoughts which are suicidal in nature. However, previous work has focused on the reappraisal of general emotion, and the present study has highlighted that the regulation of anger (but not sadness or fear) has a potentially adaptive relationship with suicidal ideation.

In terms of self-harm behaviour, this finding is more puzzling. It would be expected that reducing feelings of anger using reappraisal may eliminate the need for using self-harm to regulate emotions. However, this is not consistent with the Study 2b findings. The most common reason individuals report for engaging in self-harm behaviours is to regulate negative emotions (Bresin & Schoenleber, 2015; Madge et al., 2008), and self-harm is sometimes conceptualised as an ER strategy in the literature (Chapman et al., 2006; Linehan, 2018). Self-harm can be a way of avoiding the experience of emotions (Brereton & McGlinchey, 2020). It is possible that individuals who tend to use self-harm as a way of coping with their emotions are well practiced in avoiding the experience of emotions. Therefore, when these individuals were asked to use reappraisal during the ERT, they may have automatically defaulted to using avoidance to regulate the feelings of anger that arose,

which would explain the reduction in anger, and also its relationship to an increased likelihood of engaging in self-harm behaviour.

### ***6.5.6. Implications of Findings***

There is promising evidence that adaptive ER skills can be developed through ER training (N. Cohen & Ochsner, 2018; Denny, 2020; Herwig et al., 2019; Plate & Aldao, 2017), and these interventions have a positive impact on variables associated with mental health over time (Gratz et al., 2015; Kiosses et al., 2018; LeBlanc et al., 2020; LeBlanc et al., 2017; Morris et al., 2015; Ranney et al., 2017). In recent years there has been a move towards developing increasingly personalised longitudinal interventions to increase ER skills (Denny, 2020). The findings from the present study may provide guidance for these therapeutic interventions by highlighting that (1) gender, and (2) the specific emotion being regulated may have an impact on the clinical utility of ER. For example, using anger distraction may be beneficial for certain individuals, such as those who are predisposed to having suicidal thoughts, but not depressed individuals. Similarly, females may be more effective at using anger distraction than males, and so males may need more support in this area.

Dialectical Behavioural Therapy (DBT) aims to teach people a wide range of skills to regulate intense emotions, one of which is distraction from negative emotions (Berking et al., 2008; Lieb et al., 2004). Research has found that an increase in ER skills during a DBT programme was associated with a decrease in self-harm irrespective of intent, lower depression, and an increase in anger control amongst individuals with BPD over time (Neacsiu et al., 2010). Although distraction is only one of the many skills taught in this programme, it may be the case that anger distraction could play a role in this type of therapy, particularly as the findings of the present study indicate that there is an adaptive relationship between anger distraction and suicidal ideation. Distraction may be a beneficial strategy for

certain groups, such as older people or individuals who are impaired, compared to other strategies such as reappraisal, as distraction can be implemented regardless of the emotional situation, whereas reappraisal requires more cognitive flexibility in reinterpreting the situation (Smoski et al., 2014).

The present study was conducted with undergraduate students and community participants, rather than with individuals with a background of clinical diagnoses, and thus the generalisability of the findings to clinical settings is limited. However, in terms of the applicability of the findings for tackling mental health problems in the general population, the development of adaptive ER skills is thought to play an important role in promoting mental health and wellbeing in the community, and providing early intervention for the development of more serious clinical disorders (Jorm, 2012; Kalra et al., 2012; LeBlanc et al., 2020). The findings from the present study highlight the potential implications of using reappraisal and distraction amongst community adults.

#### ***6.5.7. Limitations of this Study***

This study was cross-sectional in nature, which means that the data were collected at one time point, and no inferences can be made about the causal relationship between variables. An interesting direction for future research is to examine if ER impacts on mental health, mental health has an impact on ER over time, or if these variables share a bi-directional relationship. In the present study, only associations between variables can be assessed using this research design, although this is an important first step in testing potential causal relationships.

Furthermore, the characteristics of the sample used in the present study may limit the generalisability of the findings. The sample was made up of university students and government analysts, with only a small proportion of the sample being from the wider

community. In the present study, some findings did not reflect what has been found in the wider literature, such as a lack of gender differences in depressive symptoms and rumination. Further, analysis between these groups did reveal differences between them, namely that students were more depressed, had higher suicidal ideation, and were more likely to self-harm than the rest of the sample. Therefore, it may not be possible to generalise the findings of the present study to the general community.

An exclusion criterion for the present study was that participants must not have a clinical diagnosis of depression. However, no information was gathered regarding whether any of the study participants are currently being treated for depression, or if they have received treatment for depression in the past (including for depressive symptoms). It would be useful to know this information as any treatment for depression may confound the relationship between ER and depressive symptoms.

Self-report questionnaires were used to measure depressive symptoms, self-harm behaviours, suicidal ideation, and psychological wellbeing. These instruments are designed to be indicative of symptoms which may accompany disorders such as depression, but are not diagnostic in nature, and so do not necessarily provide information about the prevalence of disorders (Radloff, 1977). This approach also relies on participants having a level of self-awareness of their own symptoms, although this issue is relevant to all research which uses self-reporting methods.

## **6.6. Conclusion and Next Steps**

To summarise, the present study was the first to examine the regulation of specific negative emotions as mediators of gender differences in variables associated with mental health. Two mediation effects emerged from the analyses, which implicate the regulation of anger using distraction as playing an important role in gender differences in variables

associated with mental health. Specifically, females reduced anger using distraction more effectively than males, and this was associated with higher depressive symptoms and lower suicidal ideation. This finding indicates that using distraction to reduce anger may be an important mechanism for the higher rates of depression observed amongst females, but also shows that the adaptiveness of using distraction to regulate anger may depend on the context within which its used. These findings have important implications for therapeutic programmes, by enabling more individualised support to be developed based on gender and the specific emotional context.

The most important finding from this study is that what is known about the regulation of one emotion cannot be applied to all emotions. The regulation of specific emotions using the same strategy had a different relationship with variables associated with mental health. Therefore, it is crucial for future research in the ER literature to examine the relationships between gender, ER, and variables associated with mental health in an emotion-specific manner moving forward.

## KEY POINTS FOR CHAPTER 6

1. The aims of Study 2b were (1) to test if there are gender differences in depressive symptoms, self-harm behaviours, and suicidal ideation, in line with the wider literature, (2) to examine if the regulation of specific emotions using reappraisal and distraction mediated gender differences in variables associated with mental health, and (3) to investigate if social desirability or age had an impact on the results.
2. Females were found to have a greater reduction in anger using distraction, and this was associated with (1) higher depressive symptoms, and (2) lower suicidal ideation.
3. The results highlight that what is known about one emotion cannot necessarily be applied to all emotions, and so it is imperative for future studies to examine the relationships between gender, ER and mental health in an emotion-specific manner moving forward.
4. The clinical relevance of these findings is that the effectiveness of ER may depend on (1) gender, and (2) the specific emotional context, and these findings may help to guide the development of more personalised support.

## QUESTIONS FOR SUBSEQUENT CHAPTERS

1. Considering the findings of Study 1 and Study 2 together, what does this research tell us about gender differences in emotion-specific ER, and their impact on mental health?
2. What are the wider implications of this research?

## NEXT STEPS

The empirical studies of the present research were reported in Chapter 4 (Study 1), Chapter 5 (Study 2a) and Chapter 6 (Study 2b). There was evidence of emotion-specific gender differences, and the regulation of some emotions may be related to gender differences in mental health. This research highlighted the importance of investigating gender differences in ER in an emotion-specific manner.

Now that the empirical studies have been described, the final step is to consider the wider implications of this research, which will be discussed in the next chapter.

## Chapter 7: General Discussion

### 7.1. Summary of Research

In this thesis, (1) emotion-specific ER, (2) gender differences in emotion-specific ER, and (3) the relationship between gender, emotion-specific ER, and variables associated with mental health were investigated. As reported in Section 3.5.1, the present research was driven by five overarching research questions:

- RQ1. Is ER different for specific emotions?
- RQ2. Are there gender differences in the regulation of specific emotions, and do these gender differences vary across different emotions?
- RQ3. Are there gender differences in engagement and disengagement ER?
- RQ4. Does the effectiveness of reappraisal and distraction depend on the specific emotion being regulated?
- RQ5. Are gender differences in emotion-specific ER related to gender differences in mental health?

These questions were addressed using two empirical studies, which were reported in Chapter 4 (Study 1), Chapter 5 (Study 2a), and Chapter 6 (Study 2b). The unique contribution of the present research to the wider ER literature is summarised in Table 7.1, and these findings will be discussed in the following sections. In this chapter, these findings will be reflected upon within the context of the strengths and limitations of the present research, and for this reason a separate section on limitations will not be included in this chapter.

**Table 7.1***Unique Contribution of This Research to the Emotion Regulation Literature*

<b>Study</b>	<b>Findings</b>	<b>Unique Contribution to Literature</b>
Study 1	<ul style="list-style-type: none"> <li>• Females were more likely than males to report using reappraisal for fear, but this gender difference was not found for sadness or anger.</li> <li>• Females were more likely than males to vent/express their emotions when they feel sad or scared, but not angry.</li> <li>• Young adolescent females were more likely to use engagement for sadness and fear compared to their male counterparts.</li> </ul>	<ul style="list-style-type: none"> <li>• This study was the first to show that gender differences in the reporting of reappraisal and venting/expressing emotion are emotion-specific.</li> <li>• This study also demonstrated that gender differences in engagement as a broad type of ER may depend on age, and is emotion-specific.</li> </ul>
Study 2a	<ul style="list-style-type: none"> <li>• Females were more effective than males at reducing sadness and anger using distraction.</li> <li>• Females were more effective at reducing fear using both reappraisal and distraction.</li> <li>• Reappraisal was effective for anger and fear (but not sadness), and distraction was effective for sadness and anger (but not fear).</li> </ul>	<ul style="list-style-type: none"> <li>• This study was the first to show that gender differences in ER effectiveness were emotion-specific.</li> <li>• This study was also the first to demonstrate that the effectiveness of an ER strategy depends on the specific emotion being regulated.</li> </ul>
Study 2b	<ul style="list-style-type: none"> <li>• Females had a larger reduction in anger using distraction, and this was associated with higher depressive symptoms and lower suicidal ideation.</li> </ul>	<ul style="list-style-type: none"> <li>• This study showed that the regulation of anger using distraction has important implications for depressive symptoms and suicidal ideation</li> <li>• It was also the first to show that the mediating effect of ER on the relationship between gender and variables associated with mental health is emotion-specific.</li> </ul>



## **7.2. Emotion Regulation May Differ According to the Specific Emotion Being Regulated**

The first question in the present research pertained to whether ER is different for specific emotions. An important finding to emerge from the present research is that the specific emotion being regulated matters, and the ER strategies that individuals use depend on the emotional context. In Study 1, the percentage of the group that reported using each strategy was compared between sadness, anger, and fear situations. This was examined across a range of strategies, including some of the most commonly studied strategies in the literature – avoiding the situation, distraction, experiential avoidance, hostility to others, listening to music, passivity, problem solving by taking action, reappraisal, rumination, self-talk, social support, sports/exercise, taking time out, watching TV/movies, and expressing/venting emotion.

All of the strategies, except passivity, differed across the specific emotions. There is evidence in the wider literature that specific emotions tend to be regulated using different strategies (Dixon-Gordon et al., 2015a; Vishkin et al., 2020; Zimmermann & Iwanski, 2014), which is consistent with the findings of the present research. Specifically, individuals may be more likely to seek social support, or use passivity, or avoidance when they feel sad (Zimmermann & Iwanski, 2014). Although there was no emotion-specific difference for passivity in the present study, it did emerge that individuals are more likely to seek social support when they feel sad, which is consistent with previous research. It also emerged that individuals are more likely to avoid the experience of sadness, which is in line with Dixon-Gordon et al. (2015a) and Zimmermann and Iwanski (2014). It emerged in the present research that individuals may be more likely to physically leave or avoid a situation which involves fear or anger, which was also found in Rivers et al. (2007). This highlights an important distinction between experiential avoidance and physical avoidance (i.e., avoiding a situation) in terms of the specific emotional context in which these strategies are used.

Reappraisal was more often used to regulate sadness and fear than anger in the present study. Although different tactics of reappraisal were not measured in the present research, a previous study found that reappraisal tactics may also differ by emotion (Vishkin et al., 2020). Overall, the findings of the present research and previous studies indicate that specific emotions are regulated in different ways.

### ***7.2.1. Implications for Discrete Emotion Theory***

According to the discrete perspective of emotions, and specifically the functionalist approach (described in Section 1.2.2.1), emotions are often thought to serve different functions to aid survival (Lench et al., 2015). The findings of the present research (and other emotion-specific studies) support this functionalist approach. For example, sadness is believed to have a social function that involves eliciting sympathy and support from others after a loss (Balsters et al., 2013; Lench et al., 2015), and so it is fitting that more people seek social support to cope with this emotion. A fearful situation may represent a significant threat in the environment and so it is logical that individuals may regulate their emotions by avoiding the situation, which also has a self-preservation function, by removing the threat (Campos et al., 1994; Lench et al., 2016). Therefore, the Study 1 finding that reported ER differed across specific emotions indicates that ER may depend on the emotional context. This is consistent with a discrete perspective of emotions, particularly the functionalist view that emotions serve different adaptive functions.

### ***7.2.2. Developing Emotion-Specific ER Instruments***

Through conducting the present research, an important limitation in the field was highlighted – there are a lack of available instruments to measure ER in an emotion-specific manner. As described in Section 3.5.2, the current research used two key methodological

approaches – (1) measuring how many participants from different groups reported using ER strategies, and (2) measuring how effectively individuals reduced self-reported emotion during an experimental task. This yielded two useful metrics of ER, which were used to examine gender differences in ER. However, another approach is measuring the extent to which individuals use ER strategies habitually in their daily lives using traditional self-report questionnaires, such as the ERQ (Gross & John, 2003). This approach produces a mean score for different ER strategies, which can be used to examine group differences in ER.

There are a limited number of self-report instruments currently available in the literature that measure ER in an emotion-specific manner by measuring specific emotions on separate scales. Further, the emotion-specific questionnaires that are available often miss out important ER strategies. The two emotion-specific measures are the FEEL-KJ (Cracco et al., 2015) and the Negative Emotion Regulation Inventory (NERI; Zimmermann et al., 2008). The FEEL-KJ is used to measure ER to regulate sadness, anger, and anxiety amongst children and adolescents. Although the FEEL-KJ measures a wide range of strategies, it does not include some of the most common strategies in the literature, such as reappraisal and suppression. Similarly, the NERI also measures emotion-specific ER in adolescents and adults, but does not include reappraisal. This is problematic, because ER research has highlighted reappraisal as an important ER strategy for a range of different life outcomes (Aldao et al., 2010; Appleton et al., 2013; Appleton et al., 2014; Balzarotti et al., 2016; E. Davis & Levine, 2013; Gross & John, 2003; McRae et al., 2012b; Troy et al., 2010).

Although these emotion-specific measures represent a step forward for the field of ER, they are limited in that they do not allow for the impact of emotion-specific reappraisal on outcomes to be assessed. The findings of the present research have highlighted that the effectiveness of reappraisal depends on the specific emotion being regulated. Accordingly, it is also possible that using reappraisal to regulate specific emotions may have a different

impact on life outcomes. It is therefore crucial that emotion-specific instruments that include important strategies such as reappraisal are developed in the field of ER. This will also allow for comparisons to be made across different emotion-specific studies.

In addition, it is important that any future measures can be used with different age groups, to allow emotion-specific ER to be assessed across the lifespan. The present research has shown that ER, and gender differences in ER, may change with age. This is in line with other studies which demonstrate that gender differences in ER may change with development (Nolen-Hoeksema & Aldao, 2011). The open-ended questionnaire used in Study 1 was specifically designed to be used with both adolescents and adults – by wording the questions in plain English, without using jargon (as described in Section 3.5.2.1). This was found to be successful as all participants were able to provide meaningful responses in the study. Therefore, emotion-specific measures should be developed with a view of using these measures with a range of age groups to assess emotion-specific age differences in ER.

In sum, an important direction for future research is the development of self-report questionnaires which (1) measure ER in an emotion-specific manner, (2) measure a wide range of ER strategies, including important strategies such as reappraisal, (3) measure different aspects of ER, such as ER effectiveness and ER frequency, as the present research has shown that these are not interchangeable, and (4) can be used across different age groups. The findings of the present research have highlighted the key strategies that individuals report using for each emotion (e.g., seeking social support, sports/exercise, venting, listening to music, reappraisal, problem solving), and have shown the strategies that demonstrate gender differences (e.g., seeking social, support, venting, reappraisal, listening to music). These strategies, along with other common strategies in the literature (e.g., rumination, suppression, avoidance, distraction), should be included in any emotion-specific instrument. The development of such an instrument will add value to the field by allowing emotion-specific

ER research to become standard practice and will enable a deeper understanding of how regulating specific emotions may have a differential impact on a range of outcomes.

### ***7.2.3. Conducting Emotion-Specific Research in a More Naturalistic Setting***

In Study 1, a measure was used which relied on participants retrospectively reporting on their ER in different emotional contexts, and also depended on participants having an awareness of their ER processes. This self-report method is a valuable tool which allowed ER to be measured for specific emotions and a similar version of this approach has been used in previous ER studies (Dixon-Gordon et al., 2015a; Goubet & Chrysikou, 2019; Rivers et al., 2007). Although self-report methods which rely on retrospective accounts of ER are frequently used in the field with much success (Aldao et al., 2010; Gratz & Roemer, 2004; Gross & John, 2003), they can be subject to bias (Shiffman et al., 2008). Individuals can have difficulty recalling information from their autobiographical memory when reporting on surveys, which can result in inaccuracies in the information provided (Bradburn et al., 1987). Therefore, an important step for future research is to examine the use of ER strategies in specific emotional contexts in a more naturalistic way, which does not rely on these retrospective accounts of ER.

A useful method for measuring ER in a naturalistic setting is ecological momentary assessment (EMA). EMA includes a range of methods that involve repeatedly measuring a psychological phenomenon as it is happening in real-time (Shiffman et al., 2008). Using EMA to measure emotion-specific ER may involve participants completing a diary entry at regular intervals throughout the day, or when they experience an emotional episode, and reporting on what they are doing in the moment to try to reduce this feeling, if anything. Participants report on what they are feeling (i.e., the subjective experience of their specific emotion), and may select options from a range of items which represent different ER

strategies (e.g., 'I tried to change what I am thinking about to something more neutral or positive' represents the use of reappraisal). Participants may also be asked how effective the strategy has been for reducing that particular emotion during the emotional situation.

Using EMA would build on the findings of Study 1 by allowing emotion-specific ER to be examined in a real-world setting, which increases the ecological validity of the findings (Shiffman et al., 2008). It also allows both the use of ER strategies and the effectiveness of these strategies (as defined by the participant) to be assessed in a single study, as both momentary affect (i.e., level of subjective experience in the moment), and the ER strategy used are both reported. EMA has been used in studies of ER with success (Bai et al., 2020; Colombo et al., 2020; Stanley et al., 2021).

This method may be particularly useful for examining ER amongst groups who have less awareness of their ER processes. For example, in Study 1, adolescents had a higher percentage of missing data than older participants, and males had more missing data than females, which may indicate that adolescents and males had more difficulty recalling their ER strategies or had less awareness of their ER strategies. Some ER strategies are thought to occur implicitly, outside of conscious awareness (Gyurak et al., 2011), and so participants may have more difficulty reporting these strategies using the Study 1 approach. Using EMA may encourage accurate reporting of ER amongst these groups by offering examples of ER (e.g., 'I try to avoid feeling my emotion', which represents suppression). This may allow for these groups to more easily report on their ER in the moment, without having to rely on retrospectively recalling processes from a previous experience. This approach could be used to examine group differences in emotion-specific ER, such as gender or age differences. Using this EMA approach would therefore enable emotion-specific differences in ER to be examined in a more naturalistic setting and may increase the accuracy of ER data.

### **7.3. Gender Differences in Emotion Regulation Often Depend on the Specific Emotion**

A key aim of the present research was to examine if there are gender differences in ER, and if these gender differences depend on the specific emotion. Males and females express specific emotions differently (Chaplin, 2015; Chaplin & Aldao, 2013), and receive different cultural messaging about specific emotions (Root & Denham, 2010), and so it would be logical that gender differences in ER also depended on the specific emotion. It emerged that gender differences in ER often, but not always, depend on the specific emotion being regulated.

#### ***7.3.1. Gender Differences in Reappraisal***

One of the most important findings to emerge from the present research was that gender differences in reappraisal were emotion-specific. In previous research, there have been mixed findings regarding gender differences in reappraisal, with some studies finding that females use reappraisal more (Gullone et al., 2010; R. C. Martin & Dahlen, 2005; Nolen-Hoeksema & Aldao, 2011; Smrtnik-Vitulić & Prosen, 2016; Spaapen et al., 2014), others finding that males use reappraisal more (Esmailinasaba et al., 2016; Öngen, 2010), and some research showing no gender differences in reappraisal (Garnefski et al., 2004; Gross & John, 2003; Haga et al., 2009; Zlomke & Hahn, 2010). A reason for these mixed findings may be that previous research failed to examine gender differences in reappraisal in an emotion-specific manner, which was addressed in the present research.

Specifically, in Study 1, females were more likely than males to report using reappraisal to regulate fear, but this gender difference was not found for sadness or anger. Not only do females report using reappraisal more, but females were also more effective than males at reducing fear using reappraisal (as found in Study 2a). These findings indicate that females may be more effective at cognitively coping with a fearful situation, and may do so

more often than males. This finding brings clarity to an area which has been plagued with confusion and ambiguity, and demonstrates that clearer findings emerge when gender differences in ER are examined in an emotion-specific manner. Crucially, if reappraisal had been measured in the present research in an emotion-general manner, then these clear gender differences may not have been found.

Compared to males, females self-report experiencing more fear and are more likely to develop anxiety disorders (McLean & Anderson, 2009). Females may also have an attentional bias towards fearful stimuli (Conway et al., 2007). If it is the case that females experience more fear than males, then it is possible that females have developed effective ways of coping with this emotion, such as using reappraisal. This is in line with the findings of the present study that females are more likely to use reappraisal for fearful situations, and do so more effectively than males. According to appraisal theories (Lazarus & Folkman, 1984; Roseman & Evdokas, 2004), and the process model (Gross, 1998b), emotions arise from an appraisal of a situation. Females are thought to have more negative threat appraisals than males (Kucharska, 2017; Tamres et al., 2002) which may result in a larger fear response (Campbell & Muncer, 2017). Reappraisal involves changing an initial appraisal of a situation, and so it is possible that when females were asked to use reappraisal during the ERT they were able to effectively reduce their fear response by directly altering this negative threat appraisal. Females had a larger fear response than males when no ER strategy was instructed to be used (i.e., females reported higher fear levels in the no regulation condition). This means that females were able to use reappraisal to reduce their fear to a similar level to males'. This finding is in line with the proposal that females have developed a more effective way of coping with fear using reappraisal.



### ***7.3.2. Gender Differences in Distraction***

No gender differences in the reported use of distraction emerged in Study 1, either when this was a specific ER strategy reported as ‘distraction’ by the participant (e.g., I distracted myself), or when different forms of distraction (such as watching TV or listening to music) were combined into one wider distraction category. However, in Study 2a, important findings regarding gender differences in distraction effectiveness emerged. Compared to males, females were more effective at reducing sadness and anger using distraction.

These findings indicate that even though there are no gender differences in how often males and females use distraction as an ER strategy, when they have the opportunity to use distraction (such as in the ERT), females are more effective than males at regulating sadness and anger using distraction. These findings are in contrast with the wider literature, in which males are generally more likely than females to report using distraction, at least when they feel sad (Gomez-Baya et al., 2016; Trives et al., 2016).

This discrepancy between the present study and the wider literature is potentially due to two reasons. Firstly, cognitive distraction, which involves removing attention from an emotional stimulus, was measured in Study 2a. In contrast, a mix of cognitive distraction and behavioural distraction were measured in Gomez-Baya et al. (2016) and Trives et al. (2016) and Study 1. Therefore, it is possible that males may be more likely to use behavioural forms of distraction, whereas females may be more likely to use cognitive distraction, which is in line with research demonstrating that females use cognitive ER more than males (Garnefski et al., 2004).

Furthermore, previous studies of gender differences in distraction (e.g., Gomez-Baya et al., 2016; Trives et al., 2016) measured how often males and females used distraction (i.e., ER frequency). On the other hand, how effectively males and females were able to reduce specific negative emotions using distraction were measured in the present study (i.e., ER

effectiveness). This highlights the important point that how often a strategy is used is not necessarily the same as how skilfully it is used to reduce emotions. It is possible that males use distraction more in certain contexts, but females are able to implement this more effectively when they are instructed to do so (such as during the ERT). It should also be noted that although females were more effective at reducing distraction, males were also able to effectively reduce sadness and anger using distraction, albeit to a lesser extent than females.

### ***7.3.3. Gender Differences in Expressing Sadness and Fear***

Another important finding was that females were more likely than males to report venting or expressing their emotions, and this was found for sadness and fear, but not anger. This mirrors the findings from the wider literature that females express feelings of sadness and fear more than males (Allen & Haccoun, 1976; Chaplin, 2015; Chaplin & Aldao, 2013) and emotion-specific findings that females are more likely to verbally express emotions of sadness (Rivers et al., 2007).

Cultural messaging regarding the appropriate expression of emotion for males and females may contribute to gender differences in the expression of sadness and fear. Individuals are taught that sadness and fear are more ‘feminine’ emotions, whereas anger is thought to be a more ‘masculine’ emotion (Root & Denham, 2010). In the present research, conforming to ideals of femininity were found to be correlated with reporting higher sadness and fear during the ERT. This indicates that cultural messaging around appropriate emotional behaviour for males and females may influence emotional expression of sadness and fear, as well as self-reporting of this emotional expression.

Another important point is that expressing emotion is an emotional behaviour and may not be regarded as an ER strategy as such. The method used in Study 1 relies on participants having an awareness of their own ER strategies, and being able to accurately

self-report these strategies. When participants were asked what they did to try to feel less of an emotion in Study 1, participants generally reported emotional behaviours, rather than more cognitive ER such as rumination or suppression. The high percentage of participants reporting behaviours may indicate that participants had limited insight into their own ER strategies. This may have been a particular issue for males and adolescents, as these groups had higher levels of missing data in Study 1, which may indicate that they had difficulty reporting on their ER. This is in line with the dual process model of ER (Gyurak et al., 2011), which states that ER has both implicit and explicit components. It may be the case that individuals may be less able to provide information about the implicit aspect of ER, as this is outside of conscious awareness. In the present study, this limitation was addressed by using the ERT in Study 2, which does not rely on participants having this insight into their ER processes. Therefore, in future research, it may be useful to use complementary measures of emotion-specific ER – a measure which asks participants about their explicit ER (such as the Study 1 approach), and a measure which captures more implicit ER processes (such as the ERT).

#### ***7.3.4. Similarities Between Males and Females***

Although prominent gender differences in ER emerged in the present research, it should be noted that there were also some similarities between males and females. Females reported a higher number of strategies than males in Study 1, which is consistent with other studies (Goubet & Chrysikou, 2019; Rivers et al., 2007; Sanchis-Sanchis et al., 2020), and there was no evidence that males use any ER strategy more than females. This means that males and females use some of the same ER strategies to regulate their emotions, but females also have additional ER strategies available to them. There were no gender differences in the reporting of some ER strategies, such as avoiding the situation, or experiential avoidance,

which shows that a similar proportion of males and females use these strategies. Furthermore, in Study 2, males and females were often both effective at reducing their negative emotions using ER strategies during the ERT, but females were able to reduce their negative emotions to a greater extent than males (i.e., females were more effective at ER compared to males). For example, males were able to reduce feelings of sadness using distraction in the ERT, but females were able to do this to a larger extent than males. Therefore, the present research indicates that males and females share many aspects of ER, and yet differ in others.

### ***7.3.5. Potential Vulnerability of Males***

The gender differences in ER that emerged in the present research may also highlight some areas of vulnerability for males. In Study 1 fewer males than females reported using all ER strategies, which may indicate that males are underutilising ER strategies that could potentially be adaptive. Males were also less likely to engage in social support, which indicates that males may be less likely to reach out for support when they are experiencing negative emotions. Further, males were less effective at reducing negative emotions in Study 2a, and generally had lower ER effectiveness scores than females. This may indicate that males are less skilled at using cognitive ER strategies such as reappraisal and distraction for reducing their negative emotion. This is broadly in line with findings from previous research that males use cognitive ER less than females (Garnefski et al., 2004).

Compared to females, males have higher rates of substance use (R. K. McHugh et al., 2018), and are more likely to die by suicide (Dougall et al., 2017; Jordan & McNiel, 2020; S. Lee et al., 2019; Miranda-Mendizabal et al., 2019; P. L. Mok et al., 2012; Mościcki, 1994; National Records of Scotland, 2021; Stark et al., 2004). Cognitive ER strategies such as reappraisal and distraction generally have a positive impact on variables associated with mental health (Aldao et al., 2010; In et al., 2021; Polanco-Roman et al., 2015; Stanley et al.,

2021). For example, reappraisal helps to reduce negative emotion amongst individuals who engage in self-harm behaviours (In et al., 2021). Similarly, distraction is associated with fewer instances of self-harm with suicidal intent (Polanco-Roman et al., 2015), less intense suicidal ideation (Stanley et al., 2021), and reduces the urge to self-harm regardless of intention (In et al., 2021). Therefore, encouraging the use of adaptive cognitive ER strategies such as reappraisal and distraction amongst males may help to address these issues and aid in efforts for suicide prevention and promoting mental health.

### ***7.3.6. The Role of Culture***

It should be noted that it is difficult to know from the findings of the present research whether the pattern of gender differences found are culture-specific. The present research was conducted in Scotland, but there is evidence that ER, and gender differences in ER, may have cultural differences. For example, the use of reappraisal and suppression differs by country (Haga et al., 2009), and individuals from Western countries generally report disengaging less than individuals from Eastern countries (E. Davis et al., 2012). Reappraisal may have a stronger relationship with depressive symptoms in Eastern cultures, whereas anger suppression may be more strongly related to depressive symptoms in Western cultures (Kwon et al., 2013). Gender differences in ER have also been found to depend on the cultural context (E. Davis et al., 2012). Therefore, caution should be taken when generalising the findings of the present study to other cultures. Future research may wish to examine the role of culture in gender differences in the regulation of specific emotions.

### ***7.3.7. Conducting Emotion-Specific ER Research Amongst Other Groups***

The present research focused on differences between two groups – males and females. These groups were chosen because it was important that the studies had well-defined gender

groups to examine these differences. However, as discussed in Section 2.2.1, gender is a complex social concept which can change over time (J. L. Johnson et al., 2009), and different gender identities are becoming more commonplace (Hester et al., 2020). The individuals that took part in this research had a gender identity which matched the sex they were assigned at birth, but some people have a different gender identity to the gender they were raised and socialised as (Fausto-Sterling, 2018; J. L. Johnson et al., 2009). The findings of the present study cannot necessarily be applied to these individuals.

Although this research examined group differences between males and females, it is impossible to comment on the cause of these gender differences. The present research can only establish that these gender differences exist, not where they came from. Therefore, an important direction for future research in this field is to consider ER processes amongst individuals who identify with other gender categories, such as transgender, non-binary, or gender fluid individuals. Gender and ER processes are complex and may be influenced by both biological and social factors, and so it is important that these processes are examined amongst different groups.

These groups are often vulnerable to mental health problems, and are at a high risk of suicidal ideation and self-harm (McNeil et al., 2012). As ER has a relationship with variables associated with mental health (Brewer et al., 2016; S. L. Johnson et al., 2016; LeBlanc et al., 2020; Morris et al., 2015; Ranney et al., 2017), adaptive ER skills which can be developed through ER training may represent an important protective mechanism for these individuals. Furthermore, it is particularly important to conduct this research in an emotion-specific manner, because there is evidence that people receive different messages about specific emotions such as sadness and anger based on their gender (L. R. Brody, 1985; Root & Denham, 2010), which may play a role in how these emotions are regulated. Therefore, extending this gender research to other groups is an important direction for future research.

#### **7.4. Gender Differences May Exist in Engagement Emotion Regulation**

Based on a review of the ER literature, it was hypothesised in the present research that females may be more likely to use ER strategies which involve engaging with the emotional situation, and males may be more likely to use strategies which involve disengaging or distracting from the emotional situation, which is known as the engagement hypothesis. This hypothesis was largely based on the observation that females are more likely to use rumination (D. P. Johnson & Whisman, 2013; Nolen-Hoeksema & Aldao, 2011; Zlomke & Hahn, 2010), whereas males use avoidance and distraction more (Trives et al., 2016; Zimmermann & Iwanski, 2014). This engagement hypothesis was tested in Study 1, by categorising ER strategies into either engagement, disengagement, or distraction ER using a framework developed by Parkinson and Totterdell (1999). Gender differences emerged in the use of engagement, with females being more likely to report using engagement ER.

The engagement category largely consisted of expressing/venting emotion, and seeking social support, and so the gender differences in engagement were driven by these strategies. This means that gender differences in engagement in the present study were not due to rumination, as rumination made up only 2% of this category. Thus, it cannot be inferred that females used engagement as a strategy more generally, but rather females report using specific strategies such as venting and seeking social support more than males. In other words, it cannot be inferred from the results of the present research that females are more likely than males to engage with their emotions or the emotional situation during ER. But rather, females are more likely to use specific ER strategies such as seeking social support, or venting/expression emotions. However, it should also be noted that as ER was measured through self-report in Study 1, individuals may have had less insight into their cognitive ER

processes such as rumination, and so reported more behavioural strategies such as seeking social support that they are more familiar with.

#### ***7.4.1. Limitations of Parkinson & Totterdell Framework***

In Study 1, the taxonomy of ER strategies developed by Parkinson and Totterdell (1999) was used to code the ER strategies into wider categories. This framework was chosen because it provides valuable guidance on allocating ER strategies into broad categories of engagement, disengagement, and distraction ER, which enabled the engagement hypothesis to be tested. However, it is possible that this framework was not the most appropriate method for testing this hypothesis, as gender differences emerged in some strategies which were classed as engagement (e.g., social support, venting) but not others (e.g., problem solving, self-talk). It is possible that these categories were too broad to capture meaningful gender differences. Also, the level of intercoder agreement for categorising ER strategies into these wider categories was  $\kappa = .59$ . This represents moderate agreement between the coders (J. Cohen, 1960), but may indicate that there is an issue with the reliability of these categories. Therefore, rather than classing ER strategies into wider categories, it may be helpful in future research to examine gender differences in engagement and disengagement by measuring the individual ER strategies, as clearer gender differences emerged in the present research when ER strategies were examined separately.

#### ***7.4.2. Examining Engagement ER in Future Research***

To test the engagement hypothesis in future research, it may be useful to use the EMA approach described in Section 7.2.3. Using this approach, participants could be asked to report on their use of specific ER strategies that can be defined as engagement (e.g., rumination, reappraisal), or disengagement (e.g., avoidance, suppression, distraction) to



regulate their specific emotions as they experience them in their daily lives. Participants could also be asked to describe their intention or goal in regulating their emotions (e.g., attempting to distract themselves). Collecting information about a participant's intention when using ER may provide insight into whether an individual is attempting to engage or disengage with the emotion or emotional situation. Research has shown that attempting to avoid an emotional experience rather than accepting the experience may be maladaptive (Wolgast & Lundh, 2017), and so collecting this information using EMA is useful. Gender differences in engagement and disengagement ER could be tested using such an approach.

#### ***7.4.3. Limitations of the Adult Sample in Study 1***

It should also be noted that there were limitations with the adult sample in Study 1. The adult sample was smaller than the other age groups, and there were few adult males in the sample. This means that the ability to detect a gender difference in ER amongst the adult age group was reduced. There is a chance that gender differences in the age groups follow a similar pattern but have not been picked up in the analysis due to Type II error. It was surprising that no gender differences emerged in the adult age groups, as previous research has found gender differences in engagement, disengagement, and distraction strategies (D. P. Johnson & Whisman, 2013; Trives et al., 2016; Zimmermann & Iwanski, 2014). Therefore, it is possible that a Type II error occurred with the adult sample. When adults were included in Study 2, gender differences in ER effectiveness emerged. Furthermore, it is also possible that the ER categories used (engagement, disengagement, distraction) may have been too broad to detect any meaningful differences, and perhaps the specific ER strategies are more accurate for highlighting gender differences in ER.

## **7.5. The Effectiveness of Reappraisal and Distraction May Depend on the Specific Emotion Being Regulated**

It emerged in the present research that some strategies are more effective for reducing specific emotions compared to others. In Study 2a, reappraisal was more effective than distraction for reducing fear. On the other hand, distraction was more effective than reappraisal for reducing sadness and anger (although this also depended on gender). This demonstrates that not only does the ER strategy used differ by emotion (as found in Study 1), but also that certain strategies may be more effective at reducing specific emotions. These findings have important theoretical and practical implications, which will be discussed in Section 7.6.

### ***7.5.1. Implications for the Process Model of ER***

According to Gross's (1998b) process model of ER, distraction is thought to be a more effective ER strategy than reappraisal because it appears earlier in the unfolding of an emotional response (Gross, 1998b). Empirical evidence has shown that reappraisal and distraction are both effective at reducing negative emotion (Gross, 1998a; Hermann et al., 2017; Quinn & Joormann, 2020; Smoski et al., 2014; Thiruchselvam et al., 2011), and there is some evidence that distraction may be more effective than reappraisal in certain contexts (Sheppes et al., 2009; Sheppes & Meiran, 2007, 2008; Smoski et al., 2014; Thiruchselvam et al., 2011), which supports the premise of the process model.

However, a limitation of the process model, and research testing this model, is that it does not take into account the role of specific emotions in the effectiveness of reappraisal and distraction. The present research builds on previous work and provides value to the literature by demonstrating that not only is it the point at which the ER strategy appears in the emotion cycle, but also the specific emotion being regulated, that determines the effectiveness of the

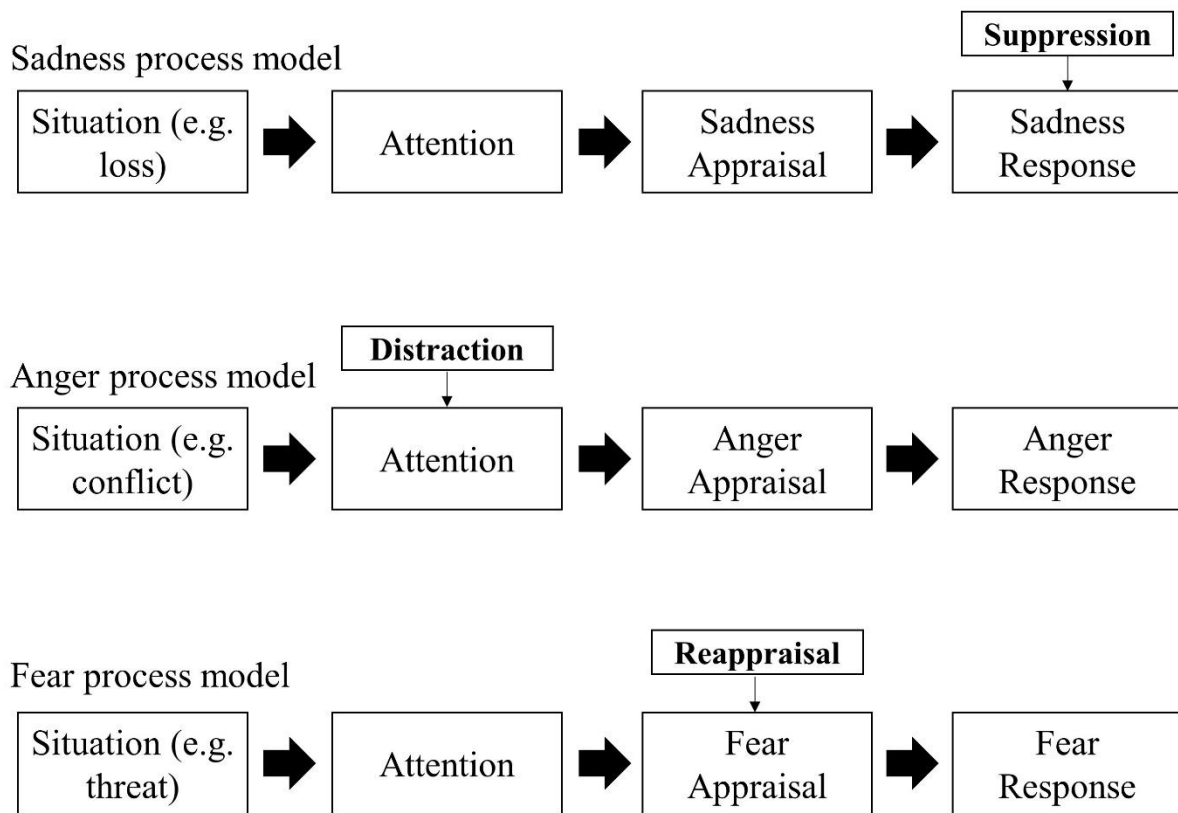
ER strategy. The present research indicates that reappraisal is more effective than distraction within the context of a fear response, but is perhaps less effective than distraction for reducing sadness or fear. Thus, the specific emotion being regulated influences the effectiveness of a particular strategy, which is not taken into account in the process model.

The process model describes the unfolding of an emotional response, and the strategies that can be used to intervene in this process, in terms of general emotion. However, the present research demonstrates that what we know about one emotion cannot necessarily be extrapolated to all emotions, or negative emotion in general. The process model has the potential to provide a theoretical framework to emotion-specific ER.

The process model could aid in understanding emotion-specific ER by allowing the regulation of specific emotions to be conceptualised as individual process models, as shown in Figure 7.1. This would involve an emotional situation occurring which is likely to induce a specific emotion, such as losing something important (sadness), interference with an important goal (anger), or a threatening situation (fear; Ekman & Cordaro, 2011). The individual pays attention to this situation, and then has an appraisal which will give rise to the specific emotion of sadness, anger, or fear (Scherer & Moors, 2019). Importantly, different ER strategies may intervene in the separate process models for these specific emotions, and their effectiveness may depend on the specific emotion being regulated. Therefore, the use of reappraisal in a fear process model may have a different effect on the emotion than the use of reappraisal in the sadness model.

**Figure 7.1**

*The Process Model of ER as a Framework for Emotion-Specific ER*



Describing ER using this emotion-specific approach will provide researchers with a theoretical framework for conceptualising the regulation of specific emotions, and examining the use and effectiveness of ER strategies within different emotional contexts. This would enable a range of issues to be examined, including individual differences in ER, group differences in ER (such as gender), comparing different ER strategies, comparing the regulation of different emotions using the same strategy, and investigating the relationship between emotion-specific ER and other outcomes (i.e., ER adaptiveness). Therefore, the process model has the potential to be a useful framework for understanding ER in an emotion-specific manner.

### ***7.5.2. Implications for Emotion Theory***

The findings of the present research also have implications for wider emotion theory. As discussed in Chapter 1, an area of debate in the literature is whether emotions can be thought of as discrete categories, such as sadness, anger, or fear, or are more continuous in nature and differ only on dimensions such as valence and arousal. The findings of the present research demonstrate that the use of ER (Study 1) and the effectiveness of ER (Study 2a) often depend on the specific emotion being regulated. These findings support a more discrete perspective of emotions, because they indicate that the way emotions are regulated depends on the specific emotional response. If emotions only differed in terms of broad dimensions, then emotion-specific differences in ER would not be likely to emerge.

The present research used subjective experience as the measure of specific emotions, and so the findings of this research indicate that individuals understand their emotional experience in terms of specific emotions, such as sadness, anger, and fear, as individuals were able to accurately report on their emotional experience. This is in line with research which shows that there are emotion-specific differences in reported emotional experience (Lench et al., 2011). This means that regardless of whether emotions are conceptualised as a product of social learning (as with the social constructivist approach; L. F. Barrett, 2017) or a hardwired innate response (as with discrete emotion theory; Panksepp, 1982), the present research demonstrates that individuals understand and categorise their emotional experience using discrete emotion labels, such as sadness, anger, and fear. Therefore, it is important to continue to examine ER in an emotion-specific manner, so that nuances between these specific emotions are not overlooked.

### ***7.5.3. Implications for Therapeutic Interventions***

The emotion-specific findings of the present research also have implications for therapeutic interventions for mood and anxiety disorders. ER is amenable to change, and there is evidence that ER training can improve mental health (Bomyea et al., 2020; Denny, 2020; Goldin et al., 2012). Training programmes that build skills in adaptive ER strategies such as reappraisal have been shown to improve ER and have a positive impact on mental health (Denny, 2020), such as lowering symptoms of anxiety (Kivity & Huppert, 2016), and reducing self-reported negative emotion over time (Denny et al., 2015; Denny & Ochsner, 2014).

The findings of the present research indicate that the emotional context within which a strategy is used may have an impact on its effectiveness. If reappraisal is indeed a more effective strategy for regulating feelings of fear, as the Study 2a findings suggest, then this strategy may be utilised in therapies aiming to treat more fear-based disorders, such as anxiety disorder or phobias (Hermann et al., 2013; Langeslag & van Strien, 2018). Reappraisal involves cognitively changing the meaning of a situation, and is similar to some of the key tenets of cognitive behavioural therapy (CBT). Indeed, CBT is useful for treating anxiety disorders (Goldin et al., 2017; Goldin et al., 2012).

Distraction emerged as being more effective for reducing sadness and anger. From a therapeutic perspective, using distraction to regulate sadness may be a useful strategy for sadness-based problems such as depression, or may be effective in addressing anger-based problems such as aggressive behaviour. Distraction is a key component of Dialectical Behavioural Therapy (DBT), and this therapy has been useful for treatment of aggressive behaviour, predominantly amongst individuals with a diagnosis of borderline personality disorder (Frazier & Vela, 2014). Distraction is also useful for reducing aggression more generally (Gallagher & Parrott, 2011; Subramani et al., 2019). It may also be beneficial in

reducing negative emotion in individuals with clinical depression (Smoski et al., 2014).

Therefore, the present research indicates that it may be helpful to use different approaches to address disorders that are characterised by specific emotional challenges.

## **7.6. The Relationships Between Gender, Emotion-Specific ER, and Variables Associated With Mental Health**

An aim of the present research was to examine whether gender differences in emotion-specific ER were related to gender differences in variables associated with mental health (depressive symptoms, self-harm behaviours, and suicidal ideation). These variables were chosen because they have prominent gender differences. Specifically, compared to males, females have higher rates of depression (H. Chen et al., 2019; Girgus & Yang, 2015; Nolen-Hoeksema & Aldao, 2011), and are more likely to engage in self-harm behaviours, irrespective of motivation (Hawton et al., 2012; Knudson et al., 2020; Madge et al., 2008; O'Connor et al., 2009). However, compared to females, more males die by suicide (National Records of Scotland, 2021).

ER is associated with variables relating to mental health (Aldao et al., 2010; Huffziger et al., 2009; Polanco-Roman et al., 2015), and there is evidence that ER may mediate gender differences in depressive symptoms (Nolen-Hoeksema et al., 1999). This has been investigated in previous research in an emotion-general manner, but the present research was the first to examine this issue in an emotion-specific manner, by measuring the regulation of sadness, anger, and fear individually. In the present research, females had a larger reduction in anger using distraction, and this was associated with higher depressive symptoms, and lower suicidal ideation. These findings implicate the regulation of anger as being related to depressive symptoms and suicidal ideation, and demonstrates that distraction as an ER strategy may be involved in gender differences in mental health.

### *7.6.1. Distracting From Anger is Associated with Gender Differences in Depressive Symptoms*

Effectively reducing anger using distraction, but not sadness or fear, was related to gender differences in depressive symptoms. This may highlight an important mechanism for explaining gender differences in depression. Response Styles Theory (RST; Nolen-Hoeksema, 1987) attempts to explain the observed gender differences in depression in terms of ER. According to RST, responding to a low mood by using distraction or problem solving is adaptive and leads to fewer depressive symptoms. Using rumination is thought to be maladaptive and may contribute to increased depressive symptoms. According to RST, females are more likely to use rumination, whereas males use distraction more, and this contributes to gender differences in depression (Nolen-Hoeksema, 1987, 1991; Nolen-Hoeksema et al., 1999; Nolen-Hoeksema et al., 1993; Nolen-Hoeksema et al., 2008).

The findings of the present research are in contrast with two of the key tenets of RST. Firstly, females were more effective at using distraction to reduce anger, which is in contrast with the proposal of RST that males use distraction more. As previously discussed, males often report using distraction more often than females when they feel sad or depressed (Gomez-Baya et al., 2016; Trives et al., 2016). It may be the case that males use distraction more often, but females are more effective at implementing this strategy when they do so within the context of experiencing anger.

Secondly, the reduction of anger using distraction was associated with higher depressive symptoms in the present research, which is in contrast with the tenet of RST that distraction has an adaptive relationship with depression and leads to reduced depressive symptoms (Nolen-Hoeksema, 1987). In the present study, distraction from anger had a maladaptive relationship with depressive symptoms. The relationship between anger



distraction and depressive symptoms was examined using a cross-sectional design, which means that these variables were measured at the same time point. This means that it is equally plausible that anger distraction impacts on depressive symptoms, but also that higher depressive symptoms contribute to anger distraction.

It is possible that distracting from feelings of anger is a maladaptive response to anger which leads to increased depressive symptoms over time. Experiencing problematic anger is associated with depressive symptoms (Abdolmanafi et al., 2011). In terms of general negative emotion, being more effective at reducing negative emotion using distraction during the ERT was associated with higher depressive symptoms amongst depressed individuals (Smoski et al., 2014), which is in line with the present findings. Females may be more effective than males at reducing anger using distraction because they are more practiced at doing so. When given a choice, females choose to distract from feelings of anger (Rusting & Nolen-Hoeksema, 1998). Females may distract from anger in an attempt to avoid this emotion, as anger is perceived as less acceptable for females to express (Brescoll & Uhlmann, 2008). This is in line with research which has found that females are more likely to suppress their emotions (Cox et al., 2000), which is similar to distraction as it involves disengaging with the emotion. There are many factors which contribute to the gender differences in depression (Nolen-Hoeksema, 1987; Nolen-Hoeksema et al., 1999), but the findings of the present research highlight anger distraction as a factor which may contribute to these gender differences.

It is also possible that individuals with higher depressive symptoms are more drawn to using anger distraction as an ER strategy. Distraction is less cognitively demanding than other strategies such as reappraisal (Sheppes et al., 2009; Sheppes & Meiran, 2008), and so may be a more attractive option for individuals coping with higher depressive symptoms. There is evidence that depressed people are likely to use distraction to avoid negative

emotion (Wolgast & Lundh, 2017). However, to more fully understand the relationship between anger distraction and depressive symptoms, this must be investigated using a longitudinal study design, to assess the causal relationships between these variables over time, as discussed in Section 7.6.5.

In sum, the findings of the present study implicate anger distraction in explaining gender differences in depression. Building on RST, it is possible that when females distract from feelings of anger, they are effective at reducing anger using this strategy, but this may have a maladaptive relationship with depression. This may be because distracting from anger exacerbates depressive symptoms, or it may also indicate that people with higher depressive symptoms are more likely to distract from feelings of anger and are perhaps more practiced in using distraction when they feel angry. This finding would indicate that within the context of anger, distraction is not an adaptive strategy, which is in contrast with RST, in which distraction is regarded as an adaptive way to cope with feelings. There is evidence that when using distraction to avoid emotion, it is maladaptive, but when using distraction while also accepting an emotion, it is adaptive (Wolgast & Lundh, 2017).

### ***7.6.2. Distracting from Anger is Associated with Gender Differences in Suicidal Ideation***

In relation to suicidal thoughts, it was found in the present study that females were more effective at reducing anger using distraction, and this was associated with lower suicidal ideation. Problematic anger predicts suicidal ideation and self-harm with suicidal intention (Dillon et al., 2020). Using distraction to cope with negative emotions more generally is associated with a lower risk of engaging in self-harm behaviours with or without suicidal intention (Polanco-Roman et al., 2015), and so it may be the case that distracting from anger is adaptive in this context, at least for females. However, it should be noted that although anger distraction was related to suicidal ideation, anger distraction was not related to self-

harm behaviour in the present research. This may be due to the measure of self-harm used, which measured self-harm behaviours using questions which specified no suicidal intent, and some questions which did not specify intent, and this measure likely captured a mix of intentions. It may be the case that as ER is related to suicidal ideation, if self-harm with suicidal intent was measured, then anger distraction may have been associated with this.

The finding that more effective anger distraction was associated with lower suicidal ideation is also in line with a study by Stanley et al. (2021). The use of distraction and positive activities to cope with negative emotions was found to lower the intensity of suicidal thoughts amongst individuals with a diagnosed mood disorder or borderline personality disorder (Stanley et al., 2021). Although females generally report higher levels of suicidal ideation (Barzilay et al., 2019; Lu et al., 2020; Stephenson et al., 2006), the findings of the present research may represent an important mechanism for reducing suicidal thoughts, by utilising the use of distraction to reduce anger. Reducing anger using distraction may have an adaptive relationship with suicidal ideation.

Suicidal ideation is one of the biggest risk factors for future self-harm with suicidal intention (García-Vega et al., 2018; Reinherz et al., 2006), and so it is important to understand the factors which may be associated with suicidal ideation. The findings of the present study indicate that being skilled in using distraction to reduce feelings of anger may have an adaptive relationship with suicidal ideation, which may highlight a potential protective factor for future suicide risk.

Dialectical behavioural therapy (DBT) was originally developed for individuals with borderline personality disorder (BPD) who engaged in self-harming behaviours, particularly females (Linehan et al., 1993). The aim of DBT is to train individuals in a range of coping skills. A key component of DBT is about teaching individuals how to accept strong feelings, while at the same time being able to distract from these in positive ways, such as doing

something else, imagining pleasant events, stop thinking about it, think about something else, remind yourself of positive experiences, ask others for help, count your breath, and take a break (Perepletchikova et al., 2011). Therefore, distraction is an important aspect of DBT.

There is mounting empirical evidence that DBT reduces self-harm and suicidal ideation (Feigenbaum, 2007; Flynn et al., 2020; Geddes et al., 2013; Guillén Botella et al., 2021; Perepletchikova et al., 2011; Rizvi & Fitzpatrick, 2021; Walton et al., 2020; Westad et al., 2021; Yang et al., 2020). The findings of the present research build on this evidence by demonstrating that emotional context may also play a role in the effectiveness of distraction during DBT. Specifically, being able to effectively use distraction when experiencing anger may be adaptively related to suicidal ideation (i.e., lower suicidal ideation). However, the results of the present research indicate that using distraction when experiencing sadness or fear may be less important in relation to suicidal ideation. In addition, it was also found that being able to effectively reduce anger using distraction was particularly important for females. Therefore, the findings of the present research may contribute to DBT practice by highlighting that experiencing anger and being able to effectively use distraction to reduce anger is important for suicidal ideation, particularly for females with high suicidal ideation.

### ***7.6.3. Why Does Anger Distraction Have a Different Relationship With Depressive Symptoms and Suicidal Ideation?***

Although distraction is generally regarded as an adaptive strategy, it has been acknowledged in the literature that whether or not distraction is adaptive depends on how it is used. When individuals distract from their emotions but also accept their emotion, distraction is adaptive in that it is associated with greater wellbeing, but when people use distraction in an attempt to avoid feeling an emotion, then it has maladaptive consequences, such as lower wellbeing (Wolgast & Lundh, 2017). This paradox is reflected in the finding that anger

distraction has a different relationship with depressive symptoms and suicidal ideation, which are generally positively correlated with one another, both in the present research (see Section 6.4.2.4) and the wider literature (De Beurs et al., 2020; Gilchrist & Sadler, 2019; Mars et al., 2019). It is possible that using distraction helps to draw attention away from suicidal thoughts (Simon et al., 2016; Stanley et al., 2021), but a consequence of this is an increase in depressive symptoms (Smoski et al., 2014).

#### ***7.6.4. Implications for Personalising Mental Health Interventions***

There is evidence that ER training can improve mental health (Bomyea et al., 2020; Denny, 2020; Goldin et al., 2012), and these interventions can have a positive impact on variables associated with mental health over time (Gratz et al., 2015; Kiosses et al., 2018; LeBlanc et al., 2020; LeBlanc et al., 2017; Morris et al., 2015; Ranney et al., 2017). Recently, there has been a move towards developing increasingly personalised interventions to train adaptive ER skills (Denny, 2020). The findings of the present research may help to guide tailoring these interventions. Specifically, it was highlighted that both gender and the emotional context may have an impact on the clinical utility of ER. Females may be more effective at using anger distraction than males, which may indicate that therapies which focus on developing these skills, such as Dialectical Behavioural Therapy or Attentional Bias Modification, may be better suited for females. However, it also highlights that males may need more support in this area.

Similarly, the present research demonstrates that the effectiveness of therapies may also depend on the emotional context and the specific problem being targeted. For example, using anger distraction may be helpful for individuals who are predisposed to having suicidal thoughts, but perhaps not individuals with depression. Distraction is regarded as a less cognitively demanding strategy than reappraisal (Sheppes et al., 2009; Sheppes & Meiran,

2008), and so it may be the case that distraction is more appropriate for certain individuals, such as individuals who are impaired (Smoski et al., 2014). In sum, the findings of the present research indicate that the effectiveness of ER may depend on gender and the emotional context, and so may help to guide personalising mental health interventions.

#### ***7.6.5. Testing Causal Relationships Between Gender, ER, and Variables Associated with Mental Health Prospectively***

It should be noted that in Study 2, variables associated with mental health were measured at the same time as ER processes, using a cross-sectional design. As a result, claims cannot be made about the causal relationships between the study variables. Theoretically, the assumption is that the way that individuals regulate their emotions has an impact on their mental health. This is the key premise of RST for example, and this has been supported with some empirical evidence (Huffziger et al., 2009; Nolen-Hoeksema et al., 1999). However, it is equally likely that individuals struggling with poor mental health may be more inclined to use certain strategies, particularly if they require less cognitive effort than other strategies, such as distraction (Sheppes et al., 2009; Sheppes & Meiran, 2008).

Thus, an important direction for future research is to examine the relationships between gender, emotion-specific ER, and variables associated with mental health prospectively. This will help to establish if the regulation of specific emotions contributes to mental health outcomes over time, or if an individual's mental health determines the ER strategies that they use. Further, examining whether males and females have a different trajectory of emotion-specific ER over time and how this relates to mental health is important, as the findings of the present research indicate that the regulation of some emotions may mediate the relationship between gender and variables associated with mental health. Therefore, by examining these variables longitudinally, the longer-term impact of

gender differences in emotion-specific ER on various mental health outcomes can be examined.

## **7.7. Some Further Methodological Considerations of this Research**

### ***7.7.1. Sampling Methodology***

There are some limitations of the sampling methodology and generalisability of the findings. As with most psychological research, it can be a challenge to recruit participants to take part in research studies. As a result, opportunity sampling methods are often used, which involve selecting participants from a target group to take part in a study and then selecting anyone who is available and willing to take part providing they meet these criteria (Brondolo, 2021). This means that it is not a random sampling approach which is used.

The samples in the present research involved a large number of student participants, as well as Government analysts in Study 2. There is some evidence that undergraduate students can differ from the wider population on some measures (Gordon et al., 1986). It emerged in the present research that the student participants had higher levels of depressive symptoms, suicidal ideation, rumination, and were more likely to self-harm than the rest of the sample. However, this does not mean that valuable insights cannot emerge from research conducted with student participants (Druckman & Kam, 2009; Greenberg, 1987), but simply indicates that caution should be exercised when generalising these findings to the general population. Similarly, different age groups were used in the present research – adolescents and young adults in Study 1, and adults of all ages in Study 2, and so it is important to exercise caution when generalising these results to people of different ages and in making comparisons between the studies.

### ***7.7.2. Applying the Results of the Emotion Regulation Task to a Real-World Setting***

In research, there is often tension between balancing ecological validity with maintaining experimental control (Parsons, 2015). An important consideration when conducting experimental research is the extent to which any findings can be applied to a real-world setting. In the present research, participants viewed images that were carefully chosen to elicit specific emotions during the ERT. Although these images reliably induce specific emotions in a laboratory setting (Mikels et al., 2005; Riegel et al., 2016), it must be acknowledged that viewing an image of a particular situation during an experiment may not have the same emotional impact as experiencing this situation in person. For example, many of the images in the present research depicted threatening animals such as snakes. However, an emotional response is thought to arise from an appraisal of the significance of a situation to the individual's personal wellbeing (Lazarus, 1991). As the participant had the knowledge that they were in a safe environment during the ERT, they may not have had the same threat appraisal that gives rise to a genuine fear response as if they had encountered the snake in the wild.

However, the ERT has been used extensively in ER research (Albanese et al., 2019; Douw et al., 2020; Fitzgerald et al., 2019; Goldin et al., 2008; Gross, 1998a; Gross & Levenson, 1997; Jackson et al., 2000; Lazarus & Alfert, 1964; McRae et al., 2012b; Notarius & Levenson, 1979; Ochsner et al., 2002; Richards & Gross, 2000; Sheppes & Meiran, 2007; Sheppes et al., 2014; Sullivan & Kahn, 2020), and many important findings have emerged from this approach. The present research is a useful starting point for examining emotion-specific gender differences in ER. However, it may be helpful for future research to build on these findings by implementing measures which may have increased ecological validity and allow for ER in naturalistic emotion-inducing situations to be observed, such as EMA (as discussed in Section 7.2.3).



### ***7.7.3. Range of Specific Emotions***

Further, the present research examined the regulation of three specific emotions – sadness, anger, and fear. As reported in Section 1.3.3.2, these emotions were chosen because they are three of the key emotions described in Ekman’s (1992) basic emotion theory, and are the main emotions focused upon in previous emotion-specific studies (Boland et al., 2019; Bujor & Turliuc, 2020; Endrerud & Vikan, 2007; Perchtold et al., 2019; Vishkin et al., 2020; Wong et al., 2018). The number of emotions examined was limited to three, because inducing emotions experimentally becomes increasingly challenging as more emotions are included in the study design. However, as highlighted in this chapter, what we now know through the present research about these three emotions cannot necessarily be generalised to other specific emotions. It is important that future research also captures other important emotions, such as shame, disgust, and surprise, as well as positive emotions such as joy and love (as discussed in Section 7.7.4). This will involve integrating these other specific emotions into ER theory, as well as developing new tools for measuring these emotions experimentally.

### ***7.7.4. The Role of Positive Emotion***

In the present research, negative emotion (specifically sadness, anger, and fear) was focused upon. The reason for examining negative emotion is that chronic negative emotion, and difficulties with regulating negative emotion, is a hallmark of many clinical disorders (Aldao et al., 2016; Aldao & Nolen-Hoeksema, 2010; Aldao et al., 2010; Cludius et al., 2020). An initial step in efforts to tackle poor mental health is examining the factors which contribute to adaptive (and maladaptive) regulation of negative emotions, and the relationship this has with mental health outcomes.

However, an important next step for future research is to also investigate the role of positive emotion in mental health. According to the broaden-and-build theory of positive emotions (Fredrickson, 2001), discrete positive emotions such as joy, interest, pride, love, and contentment have a beneficial effect by widening the range of thoughts and actions that are available to individuals. For example, experiencing the emotion of interest may help individuals to process information and new experiences, and build self-esteem and creativity (Fredrickson, 1998). Similarly, experiencing positive emotions such as enjoyment and pride predicts subsequent academic achievement amongst children (Lichtenfeld et al., 2012; Pekrun et al., 2017). Positive emotions may also build resilience and help to manage future threats (Fredrickson, 2001), and has a positive impact on the ability to process information (Kuhbandner et al., 2011).

Consequently, the broaden-and-build theory highlights a potential future direction for ER research – to examine the factors which may allow for increased positive emotion to be experienced. As with ER research examining negative emotions, relatively few studies have examined the regulation of positive emotions, such as love, joy, affection, contentment etc., in an emotion-specific manner. Therefore, future ER researchers may wish to examine emotion-specific ER processes amongst positive emotions which have been found in previous research to impact on wellbeing, such as joy, interest, pride, love, and contentment (Fredrickson, 2001). Research on the regulation of negative emotions predominantly focuses on how to reduce negative emotions (Gross & John, 2003). However, research on positive emotions may examine the ER strategies that increase levels of these positive emotions, which may have an adaptive impact on wellbeing.

## **7.8. Conclusion**

The most important message to take away from this research is that when it comes to ER, it cannot be assumed that what is known about one specific emotion, or negative emotion in general, can be applied to all emotions. The findings of the present research have provided clarity to a literature which is plagued by ambiguous findings. A reason for these unclear findings may be that previous research had not investigated these issues in an emotion-specific manner.

In the present research, it emerged that the ER strategy used depends on the specific emotional context. Similarly, gender differences in reported ER often depend on the specific emotion. Compared to males, females are more likely to use reappraisal when they are experiencing fear, and are more effective at doing so. Previous research into gender differences in reappraisal has produced mixed findings, and so the present research provides clarity to this issue.

Furthermore, there was some evidence that females may use engagement ER more than males, although this was driven by gender differences in seeking social support, and venting/expressing emotion. Gender differences in the reporting of ER strategies may change with age, although further emotion-specific research may be needed in this area. Similarly, young adults reported using engagement ER, and distraction to regulate sadness, more than adolescents, which may suggest that ER becomes more adaptive as people get older.

Additionally, the effectiveness of an ER strategy depended on the specific emotion being regulated. Reappraisal was more effective for reducing fear, whereas distraction was more effective for reducing sadness and anger (although this also varied by gender). It also emerged that ER may be associated with gender differences in depressive symptoms and suicidal ideation, but this depends on the specific emotion and the ER strategy being used.

Specifically, females were more effective at reducing anger using distraction, and this was associated with higher depressive symptoms but lower suicidal ideation.

This research has highlighted limitations with theories of ER, which presently do not take into account emotion-specific differences. It also provides support for discrete accounts of emotion. In relation to therapeutic interventions, the present research shows that emotional context, and the gender of the individual, may play an important role in the clinical utility of ER. These findings may help to develop increasingly personalised interventions to train adaptive ER skills and contribute to efforts in tackling poor mental health.

To conclude, the present research has demonstrated that the specific emotion being regulated matters, and that gender differences in ER, and the relationship between gender, ER, and variables associated with mental health, are often emotion-specific. Therefore, it may be beneficial for future research to adopt an emotion-specific approach when examining ER.

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## Appendix A

### Study 1 Information Sheet

## Participant Information Sheet

**Name of department: School of Psychological Sciences and Health**

**Title of the study: Dealing with Feelings**

### Introduction

Hello, my name is Michelle Patrick and I am a post-graduate researcher at the University of Strathclyde. I am inviting you to take part in my research study which will contribute towards my PhD in Psychology. Please carefully read the information provided on this sheet before you decide whether or not you would like to take part. If you have any questions about the study, please feel free to contact me using the email address below.

### What is the purpose of this investigation?

The purpose of this study is to investigate the different ways that people deal with three negative emotions – sadness, anger and fear. I'm interested in finding out about the different strategies that individuals use in their day-to-day lives when they experience these three emotions.

### Do you have to take part?

No, you do not have to take part in this study. Taking part is completely voluntary and you may leave at any time without judgement. Please note that not taking part will have no effect on the services that the school provides.

### What will you do in the project?

If you decide you would like to take part, you will be provided with a paper copy of a questionnaire. The questionnaire will ask about a time when you felt sad, angry or scared, and it will ask you to describe this event. It will then ask about what you did during this time to help yourself feel less sad, angry or scared. The purpose of this study is to find out more about the different strategies people use to manage these three emotions. The questionnaire should take approximately 30 minutes to complete.

### Why have you been invited to take part?

You have been invited to take part because I am interested in finding out how people of different ages manage their emotions.

### What are the potential risks to you in taking part?

There are no anticipated risks to taking part in the study. However, helpline information will be provided to you at the end of the questionnaire should this research raise any personal issues.

### What happens to the information in the project?

The information you provide in this study will be stored anonymously, which means that you cannot be linked to the data you provide. For this reason, once you have completed the study, your data cannot be removed at a later date as there will be no way of identifying it. Data will be stored in a password-protected computer and the questionnaires will be stored in a locked cabinet at the University of Strathclyde and will only be accessed and analysed by the named researchers (me and my supervisor). Data will be kept for a period of at least 5 years after which it will be securely destroyed.

The University of Strathclyde is registered with the Information Commissioner's Office who implements the Data Protection Act 1998. All personal data on participants will be processed in accordance with the provisions of the Data Protection Act 1998.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

**What happens next?**

If you are happy to be involved in the study, you will be provided with a copy of the questionnaire. If you do not wish to participate then thank you for your time. When you have completed the study, you will receive a Debrief Sheet which provides additional information about the study. If you have any questions about any aspect of the study, please contact me or Dr Rasmussen using the details below.

The results of this study will be written up in my PhD thesis and may be presented at conferences. The results of this research may also be written up in a paper which I will aim to publish in a scientific research journal. A brief report of my findings will be sent to your school.

**Researcher contact details:**

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This investigation was granted ethical approval by the University of Strathclyde Ethics Committee. If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

**Secretary to the University Ethics Committee**

Research & Knowledge Exchange Services  
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## Appendix B

### Study 1 Consent Form

# Consent Form

**Name of department: School of Psychological Sciences and Health**

**Title of the study: Dealing with Feelings**

- I confirm that I have read and understood the information sheet for the above project and the researcher has answered any questions to my satisfaction.
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, without having to give a reason and without any consequences
- I understand that anonymised data (i.e. data which do not identify me personally) cannot be withdrawn during or at the end of the study as they cannot be identified
- I consent to being a participant in the project

(PRINT NAME)	
Signature of Participant:	Date:

**Appendix C**  
Study 1 Demographic Questions

First of all, I need some more information about you. Please answer the following questions.

What is your age? (Please type into box)

What is your gender?

- Male
- Female

Can you read and write in English?

- Yes
- No

Adult SES Measure (to measure SES for adults)

What is the highest level of education you have completed?

- 1 = university or college or equivalent
- 2 = intermediate between secondary level and university (e.g., technical training)
- 3 = secondary school
- 4 = primary school only (or less)

Family Affluence Scale (to measure SES for adolescents)

Does your family own a car, van or truck?

Do you have your own bedroom for yourself?

During the past 12 months, how many times did you travel away on holiday with your family?

How many computers does your family own?



## Appendix D

### Study 1 Dealing with Feelings Questionnaire

Please answer the following questions.

Think about a time recently when you felt sad, and you did something to try to make yourself feel less sad. Describe what happened to make you feel sad in the box below.

When you felt sad during this time, what did you do to try to make yourself feel less sad? Describe this in the box below.

Can you think of any other things you have done in the past to make yourself feel less sad? Describe this in the box below.

Think about a time recently when you felt angry, and you did something to try to make yourself feel less angry. Describe what happened to make you feel angry in the box below.

When you felt angry during this time, what did you do to try to make yourself feel less angry? Describe this in the box below.

Can you think of any other things you have done in the past to make yourself feel less angry? Describe this in the box below

Think about a time recently when you felt scared, and you did something to try to make yourself feel less scared. Describe what happened to make you feel scared in the box below.

When you felt scared during this time, what did you do to try to make yourself feel less scared? Describe this in the box below.

Can you think of any other things you have done in the past to make yourself feel less scared? Describe this in the box below.

## **Appendix E**

### Study 1 Velten Mood Induction

Please read through the following sentences. As you are reading, try to let the sentences change how you feel.

I feel pretty good right now.

I feel happy.

I feel cheerful, confident.

I can think quickly and clearly right now.

Right now, I feel very contented.

Right now, I feel like smiling.

I feel alert, happy and full of energy.

I have a feeling of lightness and joy.

I really like this light-hearted feeling.

I can feel a smile on my face.

I feel so good I almost feel like laughing.

It feels great to be alive!

## Appendix F

### Debriefing Sheet

## Dealing with Feelings

Thank you for taking part in this study!

Emotion regulation (ER) refers to the ways that people manage their emotions, including how and when emotions are experienced (Gross & Thompson, 2007). The purpose of this study was to find out more about the different methods that people of different ages use to regulate three negative emotions – sadness, anger and fear.

There are many different ways that people can regulate their emotions. Some of these involve controlling our thoughts (such as reappraisal) and some of these may involve activities that we take part in (such as chatting to friends), which is known as behavioural emotion regulation. Few studies to date have explored how our behaviours can help us to regulate our emotions, which was one of the aims of the present study. Also, there is currently no reliable way to measure external emotion regulation. The data from this study will be used to inform the development of a questionnaire which measures external emotion regulation.

The data from this study will be stored in a password-protected computer and the questionnaires will be stored in a locked cabinet at the University of Strathclyde and will only be accessed and analysed by the named researchers. Data will be kept for a period of at least 5 years after which it will be securely destroyed.

**If you are concerned or worried about anything that was brought up in the study, then you may wish to talk to someone about this.**

You may find it helpful to talk to your GP. There are also services available which can let you discuss your concerns about depression, anxiety and stress (or anything else you are worried about).

### Young Minds

Young Minds is a charity dedicated to the mental health and well-being of young people. Their website (<http://www.youngminds.org.uk/>) has lots of helpful information about a whole range of mental health issues, including depression and self-harm. If you are worried about an issue, this can be a good place to find out more about it.

### Breathing Space

Breathing Space is a free, confidential, phone service for anyone in Scotland experiencing low mood, depression or anxiety. The aim of Breathing Space is to be there for people in times of difficulty, to provide a safe and supportive space by

listening, offering advice and providing information. You can phone Breathing Space on 0800 83 85 87, or find out information about a range of issues on their website (<http://breathingspace.scot/>).

If you have any questions or concerns about this project, please feel free to contact me or my supervisor. Your participation in this study is greatly appreciated.

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#### References

Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. *Handbook of emotion regulation*, 3, 24.

## Appendix G

### Study 1 ER Strategies Included in Each ER Category

<b>ER strategy</b>	<b>Broader categories of ER</b>
Acceptance	Engagement
Act happy/be happy/smile	Engagement
Attentional deployment	Disengagement
Avoid situation	Disengagement
Be in a happy environment	Engagement
Be less scared	Engagement
Breathing techniques	Engagement
Calmed down	Engagement
Change attitude	Engagement
Change conversation	Distraction
Cleaning/tidying	Distraction
Clubbing/partying	Distraction
Collect thoughts	Engagement
Comfort eating	Distraction
Confront emotion	Engagement
Confront situation	Engagement
Contact people from past	Multi-purpose
Control situation	Engagement
Counselling/therapy	Engagement
Counting	Distraction
Crack knuckles	Distraction
Creative/relaxing activity	Distraction
Deal with it	Engagement
Distance myself from emotion/situation	Disengagement
Distraction	Distraction
Do a detox	Multi-purpose
Do my best	Engagement
Do something fun	Distraction
Don't dwell on it	Multi-purpose
Don't let it affect me	Multi-purpose
Don't talk to anyone	Disengagement
Don't talk about it	Disengagement
Dress nice/put on make-up	Multi-purpose
Drink water	Distraction
Eat healthy	Multi-purpose
Experiential avoidance	Disengagement
Express/vent emotion	Engagement
Expressive suppression	Disengagement
Focus on others	Multi-purpose
Focus on school	Multi-purpose
Focus on the outcome	Multi-purpose
Focus on what I can control	Engagement
Force myself to vomit	Multi-purpose

Get fresh air	Multi-purpose
Get over it	Engagement
Go for a day out	Distraction
Go for a drive	Distraction
Go get a drink	Distraction
Go home	Disengagement
Go out	Distraction
Go to room	Disengagement
Gratitude	Engagement
Grip onto something	Engagement
Hide	Disengagement
Hit myself	Engagement
Hold on to something	Engagement
Holiday	Distraction
Hostility to others	Distraction
Humour	Distraction
Internet	Distraction
Just did it	Engagement
Keep a routine	Engagement
Keep going	Engagement
Keep out of it	Disengagement
Kindness to others	Multi-purpose
Leave emotional situation	Disengagement
Listen to music	Distraction
Look for opportunities	Engagement
Make a plan	Distraction
Make up with others	Engagement
Man up	Engagement
Medication	Multi-purpose
Meditation/yoga	Engagement
Memories	Distraction
Mindfulness	Engagement
Move on	Engagement
Move on to another task	Distraction
Observe others	Engagement
Pace up and down	Distraction
Paid respect	Engagement
Passivity	Multi-purpose
Photography	Distraction
Pinched myself	Multi-purpose
Ping a bobble to feel pain	Multi-purpose
Plan/organise	Distraction
Play well	Engagement
Prayer/religion	Engagement
Problem solving (action)	Engagement
Problem solving (thinking)	Engagement
Put a pillow over my face	Disengagement
Put earphones in	Distraction



Put it behind me	Multi-purpose
Rationalization	Engagement
Read letters	Distraction
Reappraisal	Engagement
Rumination	Engagement
Seek comfort	Distraction
Self-calming	Engagement
Self-harm	Multi-purpose
Self-talk	Engagement
Sex	Distraction
Shopping	Distraction
Shrug it off	Multi-purpose
Shut people out	Disengagement
Sleep	Distraction
Social support	Engagement
Sports/exercise	Distraction
Stay alert	Engagement
Stay away from someone	Disengagement
Stay inside	Disengagement
Stay out of trouble	Disengagement
Stick up for myself	Engagement
Stop talking to someone	Disengagement
Suicidal behaviour	Disengagement
Take positive action	Engagement
Take time out	Multi-purpose
Think about future	Multi-purpose
Training	Distraction
Travelling	Distraction
Treat myself	Distraction
Trust my instincts	Engagement
Trust people	Engagement
Trust the universe	Engagement
Try hard	Engagement
Try not to care what others think	Engagement
Try not to worry	Engagement
Try to eat nothing	Multi-purpose
TV/movies	Distraction
Use computer	Distraction
Use substances	Distraction
Video games	Distraction
Writing/journaling	Engagement

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## Appendix H

### Study 1 Cross-Tabulations used in Chi-Square Analyses

#### Gender differences in emotion regulation strategies

<b>Gender x Social Support for Sadness</b>			
	Male	Female	Total
No	141	135	276
Yes	58	134	192
Total	199	269	468
<b>Gender x Sports/Exercise for Sadness</b>			
	Male	Female	Total
No	157	225	382
Yes	42	44	86
Total	199	269	468
<b>Gender x Listen to Music for Sadness</b>			
	Male	Female	Total
No	178	204	382
Yes	21	65	86
Total	199	269	468
<b>Gender x TV/Movies for Sadness</b>			
	Male	Female	Total
No	177	227	404
Yes	22	42	64
Total	199	269	468
<b>Gender x Venting/Expressing Emotion for Sadness</b>			
	Male	Female	Total
No	188	220	408
Yes	11	49	60
Total	199	269	468
<b>Gender x Reappraisal for Sadness</b>			
	Male	Female	Total
No	184	237	421
Yes	15	32	47
Total	199	269	468
<b>Gender x Distraction for Sadness</b>			
	Male	Female	Total
No	186	236	422
Yes	13	33	46
Total	199	269	468
<b>Gender x Avoidance for Sadness</b>			
	Male	Female	Total

No	174	244	418
Yes	25	25	50
Total	199	269	468

**Gender x Venting/Expressing for Anger**

	Male	Female	Total
No	154	184	338
Yes	45	85	130
Total	199	269	468

**Gender x Social Support for Anger**

	Male	Female	Total
No	177	193	370
Yes	22	76	98
Total	199	269	468

**Gender x Sports/Exercise for Anger**

	Male	Female	Total
No	172	220	392
Yes	27	49	76
Total	199	269	468

**Gender x Hostility to Others for Anger**

	Male	Female	Total
No	185	232	417
Yes	14	37	51
Total	199	269	468

**Gender x Take Time Out for Anger**

	Male	Female	Total
No	179	241	420
Yes	20	28	48
Total	199	269	468

**Gender x Reappraisal for Anger**

	Male	Female	Total
No	188	255	443
Yes	11	14	25
Total	199	269	468

**Gender x Social Support for Fear**

	Male	Female	Total
No	172	189	361
Yes	27	80	107
Total	199	269	468

**Gender x Problem Solving for Fear**

	Male	Female	Total
No	174	224	398
Yes	25	45	70

Total	199	269	468
<b>Gender x Reappraisal for Fear</b>			
	Male	Female	Total
No	190	221	411
Yes	9	48	57
Total	199	269	468
<b>Gender x Self-Talk for Fear</b>			
	Male	Female	Total
No	190	242	432
Yes	9	27	36
Total	199	269	468
<b>Gender x Venting/Expressing for Fear</b>			
	Male	Female	Total
No	194	237	431
Yes	5	32	37
Total	199	269	468
<b>Gender x Removing Attention for Fear</b>			
	Male	Female	Total
No	191	259	450
Yes	8	10	18
Total	199	269	468
<b>Gender x Avoid the Situation for Fear</b>			
	Male	Female	Total
No	188	246	434
Yes	11	23	34
Total	199	269	468
<b>Gender x Rumination for Fear</b>			
	Male	Female	Total
No	194	262	456
Yes	5	7	12
Total	199	269	468

**The relationship between gender and engagement, disengagement, and distraction  
(engagement hypothesis)**

<b>Gender x Engagement for Sadness</b>			
	Male	Female	Total
No	101	89	190
Yes	82	175	257
Total	183	264	447

<b>Gender x Engagement for Anger</b>			
	Male	Female	Total
No	71	73	144
Yes	98	176	274
Total	169	249	418

<b>Gender x Engagement for Fear</b>			
	Male	Female	Total
No	66	67	133
Yes	66	161	227
Total	132	228	360

<b>Gender x Disengagement for Sadness</b>			
	Male	Female	Total
No	153	229	382
Yes	30	35	65
Total	183	264	447

<b>Gender x Disengagement for Anger</b>			
	Male	Female	Total
No	126	170	296
Yes	43	79	122
Total	169	249	418

<b>Gender x Disengagement for Fear</b>			
	Male	Female	Total
No	92	160	252
Yes	40	68	108
Total	132	228	360

<b>Gender x Distraction for Sadness</b>			
	Male	Female	Total
No	74	99	173
Yes	109	165	274
Total	183	264	447

<b>Gender x Distraction for Anger</b>			
	Male	Female	Total
No	106	145	251
Yes	63	104	167

Total	169	249	418
<b>Gender x Distraction for Fear</b>			
	Male	Female	Total
No	101	165	266
Yes	31	63	94
Total	132	228	360

**Relationship Between Age Groups (Younger Adolescents, Older Adolescents, Adults) and each Category of ER – Engagement, Disengagement, and Distraction (Yes, No) Across Both Genders (Main effect of age)**

<b>Age Group x Engagement for Sadness</b>				
	Younger Ad	Older Ad	Adults	Total
No	111	51	26	188
Yes	145	49	60	254
Total	256	100	86	442

<b>Age Group x Engagement for Anger</b>				
	Younger Ad	Older Ad	Adults	Total
No	94	39	11	144
Yes	145	55	71	271
Total	239	94	82	415

<b>Age Group x Engagement for Fear</b>				
	Younger Ad	Older Ad	Adults	Total
No	90	29	14	133
Yes	112	53	58	223
Total	202	82	72	356

<b>Age Group x Disengagement for Sadness</b>				
	Younger Ad	Older Ad	Adults	Total
No	208	94	75	377
Yes	48	6	11	65
Total	256	100	86	442

<b>Age Group x Disengagement for Anger</b>				
	Younger Ad	Older Ad	Adults	Total
No	169	66	58	293
Yes	70	28	24	122
Total	239	94	82	415

<b>Age Group x Disengagement for Fear</b>				
	Younger Ad	Older Ad	Adults	Total

No	138	58	52	248
Yes	64	24	20	108
Total	202	82	72	356
<b>Age Group x Distraction for Sadness</b>				
	Younger Ad	Older Ad	Adults	Total
No	117	38	14	169
Yes	139	62	72	273
Total	256	100	86	442
<b>Age Group x Distraction for Anger</b>				
	Younger Ad	Older Ad	Adults	Total
No	151	58	40	249
Yes	88	36	42	166
Total	239	94	82	415
<b>Age Group x Distraction for Fear</b>				
	Younger Ad	Older Ad	Adults	Total
No	154	63	46	263
Yes	48	19	26	93
Total	202	82	72	356

**Relationship Between Gender (Males, Females) and each Category of ER –  
Engagement, Disengagement, and Distraction (Yes, No), Broken Down by Age Group**

<b>Gender x Sadness Engagement for Young Adolescents</b>			
	Male	Female	Total
No	65	46	111
Yes	56	89	145
Total	121	135	256
<b>Gender x Sadness Engagement for Older Adolescents</b>			
	Male	Female	Total
No	26	25	51
Yes	13	36	49
Total	39	61	100
<b>Gender x Sadness Engagement for Adults</b>			
	Male	Female	Total
No	9	17	26
Yes	10	50	60
Total	19	67	86
<b>Gender x Sadness Disengagement for Young Adolescents</b>			
	Male	Female	Total
No	97	111	208

Yes	24	24	48
Total	121	135	256
<b>Gender x Sadness Disengagement for Older Adolescents</b>			
	Male	Female	Total
No	36	58	94
Yes	3	3	6
Total	39	61	100
<b>Gender x Sadness Disengagement for Adults</b>			
	Male	Female	Total
No	16	59	75
Yes	3	8	11
Total	19	67	86
<b>Gender x Sadness Distraction for Young Adolescents</b>			
	Male	Female	Total
No	51	66	117
Yes	70	69	139
Total	121	135	256
<b>Gender x Sadness Distraction for Older Adolescents</b>			
	Male	Female	Total
No	17	21	38
Yes	22	40	62
Total	39	61	100
<b>Gender x Sadness Distraction for Adults</b>			
	Male	Female	Total
No	2	12	14
Yes	17	55	72
Total	19	67	86
<b>Gender x Anger Engagement for Young Adolescents</b>			
	Male	Female	Total
No	51	43	94
Yes	61	84	145
Total	112	127	239
<b>Gender x Anger Engagement for Older Adolescents</b>			
	Male	Female	Total
No	15	24	39
Yes	22	33	55
Total	37	57	94
<b>Gender x Anger Engagement for Adults</b>			
	Male	Female	Total
No	5	6	11
Yes	13	58	71
Total	18	64	82



<b>Gender x Anger Disengagement for Young Adolescents</b>			
	Male	Female	Total
No	84	85	169
Yes	28	42	70
Total	112	127	239
<b>Gender x Anger Disengagement for Older Adolescents</b>			
	Male	Female	Total
No	28	38	66
Yes	9	19	28
Total	37	57	94
<b>Gender x Anger Disengagement for Adults</b>			
	Male	Female	Total
No	12	46	58
Yes	6	18	24
Total	18	64	82
<b>Gender x Anger Distraction for Young Adolescents</b>			
	Male	Female	Total
No	69	82	151
Yes	43	45	88
Total	112	127	239
<b>Gender x Anger Distraction for Older Adolescents</b>			
	Male	Female	Total
No	27	31	58
Yes	10	26	36
Total	37	57	94
<b>Gender x Anger Distraction for Adults</b>			
	Male	Female	Total
No	8	32	40
Yes	10	32	42
Total	18	64	82
<b>Gender x Fear Engagement for Young Adolescents</b>			
	Male	Female	Total
No	54	36	90
Yes	37	75	112
Total	91	111	202
<b>Gender x Fear Engagement for Older Adolescents</b>			
	Male	Female	Total
No	9	20	29
Yes	16	37	53
Total	25	57	82
<b>Gender x Fear Engagement for Adults</b>			
	Male	Female	Total

No	3	11	14
Yes	10	48	58
Total	13	59	72
<b>Gender x Fear Disengagement for Young Adolescents</b>			
	Male	Female	Total
No	58	80	138
Yes	33	31	64
Total	91	111	202
<b>Gender x Fear Disengagement for Older Adolescents</b>			
	Male	Female	Total
No	19	39	58
Yes	6	18	24
Total	25	57	82
<b>Gender x Fear Disengagement for Adults</b>			
	Male	Female	Total
No	12	40	52
Yes	1	19	20
Total	13	59	72
<b>Gender x Fear Distraction for Young Adolescents</b>			
	Male	Female	Total
No	70	84	154
Yes	21	27	48
Total	91	111	202
<b>Gender x Fear Distraction for Older Adolescents</b>			
	Male	Female	Total
No	20	43	63
Yes	5	14	19
Total	25	57	82
<b>Gender x Fear Distraction for Adults</b>			
	Male	Female	Total
No	8	38	46
Yes	5	21	26
Total	13	59	72

## Appendix I

### Study 2 Information Sheet

# Participant Information Sheet (Online)

**Name of department: School of Psychological Sciences and Health**

**Title of the study: Dealing with feelings: An emotional picture study**

#### **Introduction**

My name is Michelle Patrick and I am a PhD researcher at the University of Strathclyde. I am inviting you to take part in my research study which will contribute towards my PhD in Psychology. Please carefully read this information before deciding whether or not you would like to take part. If you have any questions about the study, please feel free to contact me using the email address below before taking part.

#### **What is the purpose of this investigation?**

The aim of this study is to explore the different ways that people manage their emotions, and to see if managing emotions is associated with mental health and wellbeing. Although it is known that managing negative emotion in general is related to positive mental health, it is unclear if how we deal with specific emotions such as sadness and fear is also important, which is the aim of this study.

#### **Do you have to take part?**

You do not have to take part in this study, and you can stop taking part at any time. If you feel uncomfortable answering any questions, then you may leave these blank. At the time of data collection, if you do not want your data to be included, then this can be destroyed.

#### **What will you do in the project?**

There are two parts to this study. The first part takes place online, and involves completing questionnaires. These questionnaires will ask questions about a range of issues, such as well-being, and the different ways that you cope with difficult situations. Some of the questions will ask about sensitive issues, such as self-harm, thinking about suicide, and depression. If you feel uncomfortable answering these questions, then you may leave them blank. The questionnaires are not diagnostic, which means that they cannot tell you if you have a disorder such as depression. However, if you are worried about how you have answered the questions, then you may wish to talk to your GP about this.

At the end of the online session, you will be invited to take part in an experiment in person, approximately one week later. This experiment will take place at the Graham Hills Building on George Street in Glasgow. The task will involve looking at emotional pictures, and you will be asked to either (1) look at the picture as you normally would, (2) try to change the meaning of what is happening in

the picture, or (3) try to think about something unrelated to what is happening in the picture. After viewing each picture, you will be asked to rate how you feel, and then briefly describe what you thought about while looking at the picture. Some of these pictures contain emotional content which may be upsetting, and you will be free to stop the task at any time if you feel uncomfortable. The task should take no longer than 30 minutes, and you will be provided with additional information at the end of the study. All participants will receive £5 for their time.

### **Why have you been invited to take part?**

You have been invited to take part because I am interested in finding out more about how adults regulate their emotions, and the relationship this has with mental health. I am looking for individuals (1) aged 16 or over, (2) who can read and write in English, (3) who identify as either male or female (4) whose gender identity is the same as the biological sex they were born as (i.e., male or female) and (5) who do not have a clinical diagnosis of depression.

### **What are the potential risks to you in taking part?**

There are no anticipated risks to taking part in the study. However, if you feel uncomfortable at any time during the study, then you may stop at any time. If you feel upset during the picture task, please let the researcher know, and she will end the task. Also, you will be provided with helpline information at the end of the session should you need any additional support. If you feel worried about anything that is raised during the study, we encourage you to reach out to one of these helplines for support.

### **What happens to the information in the project?**

You will be asked to provide your name and email address at the end of the online survey to arrange a time to take part in the second part of the study. This information will be used to link your data from each part of the study, and once this data has been linked, this personal information will be deleted. This means that you cannot ask to have your data deleted after the point of data collection, because it will be impossible to identify your data. Any personal information will be confidential, which means that only the named researchers will have access to this information, and no identifying information will be included in my thesis or in any published work. Data will be stored on a password-protected computer and will only be accessed and analysed by the named researchers (me and my supervisors). Data will be kept for a period of at least 5 years after which it will be securely destroyed.

The University of Strathclyde is registered with the Information Commissioner's Office who implements the Data Protection Act 1998. All personal data on participants will be processed in accordance with the provisions of the Data Protection Act 1998.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

### **What happens next?**

If you would like to take part, please read the consent form on the next page and tick the box if you are happy to take part. If you do not wish to participate then thank you for your time so far. If you have any questions about any aspect of the study, please contact me or my supervisors using the details below.

The results of this study will be written up in my PhD thesis and may be presented at conferences. The results of this research may also be written up in a paper which I will aim to publish in a scientific research journal.

**Researcher contact details:**

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**Dr Susan Rasmussen (Supervisor)**

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Phone: 0141 548 2575

This investigation was granted ethical approval by the University of Strathclyde Ethics Committee.

If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

**Secretary to the University Ethics Committee**

Research & Knowledge Exchange Services

University of Strathclyde

Graham Hills Building

50 George Street

Glasgow

G1 1QE

Telephone: 0141 548 3707

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

# Participant Information Sheet (Emotion Regulation Task)

**Name of department: School of Psychological Sciences and Health**

**Title of the study: Dealing with feelings: An emotional picture study**

## **Introduction**

My name is Michelle Patrick and I am a PhD researcher at the University of Strathclyde. You have been invited to take part in this follow-up to the study entitled 'Dealing with feelings: An emotional picture study'. The first part of the study took place online. If you did not complete the first part of the study, please let the researcher know. This research study will contribute towards my PhD in Psychology. Please carefully read this information before deciding whether or not you would like to participate in this part of the study. If you have any questions, please feel free to ask the researcher before continuing.

## **What is the purpose of this investigation?**

The aim of this study is to explore the different ways that people manage their emotions, and to see if managing emotions is associated with mental health and wellbeing. In this part of the study, we are interested in finding out how you feel after looking at emotional pictures during a task.

## **Do you have to take part?**

You do not have to take part in this study, and you can stop taking part at any time. If you feel uncomfortable answering any questions, then you may leave these blank. At the time of data collection, if you do not want your data to be included, then this can be destroyed.

## **What will you do in the project?**

There are two parts to this study. The first part took place online, and involved answering some questionnaires. You were invited to take part in this session after answering these questionnaires. If you did not take part in the online session, please let the researcher know before continuing.

During this session, you will take part in an emotional picture task. The task will involve looking at emotional pictures, and you will be asked to either (1) look at the picture as you normally would, (2) try to change the meaning of what is happening in the picture, or (3) try to think about something unrelated to what is happening in the picture. After viewing each picture, you will be asked to rate how you feel, and then briefly describe what you thought about while looking at the picture. Some of these pictures contain emotional content which may be upsetting, and you will be free to stop the task at any time if you feel uncomfortable. The task should take no longer than 30 minutes, and you will be provided with additional information at the end of the study. All participants will receive £5 for their time.

**Why have you been invited to take part?**

You have been invited to take part because I am interested in finding out more about how adults regulate their emotions, and the relationship this has with mental health. I am looking for individuals (1) aged 16 or over, (2) who can read and write in English, (3) who identify as either male or female (4) whose gender identity is the same as the biological sex they were born as (i.e., male or female) and (5) who do not have a clinical diagnosis of depression.

**What are the potential risks to you in taking part?**

There are no anticipated risks to taking part in the study. However, if you feel uncomfortable at any time during the study, then you may stop at any time. If you feel upset during the picture task, please let the researcher know, and she will end the task. Also, you will be provided with helpline information at the end of the session should you need any additional support. If you feel worried about anything that is raised during the study, we encourage you to reach out to one of these helplines for support.

**What happens to the information in the project?**

You were asked to provide your name and email address at the end of the online survey to arrange a time to take part in the second part of the study. This information will be used to link your data from each part of the study, and once this data has been linked, this personal information will be deleted. This means that you cannot ask to have your data deleted after the point of data collection, because it will be impossible to identify your data. Any personal information will be confidential, which means that only the named researchers will have access to this information, and no identifying information will be included in my thesis or in any published work. Data will be stored on a password-protected computer and will only be accessed and analysed by the named researchers (me and my supervisors). Data will be kept for a period of at least 5 years after which it will be securely destroyed.

The University of Strathclyde is registered with the Information Commissioner's Office who implements the Data Protection Act 1998. All personal data on participants will be processed in accordance with the provisions of the Data Protection Act 1998.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

**What happens next?**

If you would like to take part, please read and sign the consent form on the next page. If you do not wish to participate then thank you for your time so far.

At the end of this session, you will receive a debrief sheet which contains additional information about the study. If you have any questions about any aspect of the study, please contact me or my supervisors using the details below.



The results of this study will be written up in my PhD thesis and may be presented at conferences. The results of this research may also be written up in a paper which I will aim to publish in a scientific research journal.

**Researcher contact details:**

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This investigation was granted ethical approval by the University of Strathclyde Ethics Committee. If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

**Secretary to the University Ethics Committee**

Research & Knowledge Exchange Services  
University of Strathclyde

Graham Hills Building  
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Telephone: 0141 548 3707  
Email: [ethics@strath.ac.uk](mailto:ethics@strath.ac.uk)

## Appendix J

### Study 2 Consent Form

# Consent Form

**Name of department: School of Psychological Sciences and Health**

**Title of the study: Dealing with feelings: An emotional picture study**

- I confirm that I have read and understood the information sheet for the above project and the researcher has answered any queries to my satisfaction.
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, up to the point of completion, without having to give a reason and without any consequences.
- I understand that I can withdraw from the study any personal data (i.e., data which identify me personally) up until the point of data collection.
- I understand that anonymised data (i.e., data which do not identify me personally) cannot be withdrawn once they have been included in the study.
- I understand that any information recorded in the investigation will remain confidential and no information that identifies me will be made publicly available.
- I consent to being a participant in the project

## **Appendix K**

### Study 2 Demographic Questions

#### **Age**

How old are you? (Please type your answer into the box)

#### **Sex and Gender**

What is your sex? (Please type your answer into the box)

What gender do you identify as? (Please type your answer into the box)

#### **Ethnic Background**

Please select the option that best describes your ethnic group or background.

White

- English/Welsh/Scottish/Northern Irish/British
- Irish
- Gypsy or Irish Traveller
- Any other White background, please write in the box

Mixed/Multiple Ethnic Groups

- White and Black Caribbean
- White and Black African
- White and Asian
- Any other Mixed/multiple ethnic background, please write in the box

Asian/Asian British

- Indian
- Pakistani
- Bangladeshi
- Chinese
- Any other Asian background, please write in the box

Black/African/Caribbean/Black British

- African
- Caribbean
- Any other Black/African/Caribbean background, please write in the box

Other Ethnic Group

- Arab
- Any other ethnic group, please write in the box

**Socioeconomic Status**

What is the highest level of education you have completed?

- University or College or Equivalent
- Intermediate between Secondary Level and University (e.g. Technical Training)
- Secondary School
- Primary School only (or less)

**Student Status**

Are you currently a student?

- Yes
- No

## Appendix L

### Study 2 Emotion-General ER Questionnaires

#### **Emotion Regulation Questionnaire (ERO) (Reappraisal and Suppression)**

##### **Instructions and Items**

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1-----2-----3-----4-----5-----6-----7

strongly neutral strongly

disagree agree

1. \_\_\_ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
2. \_\_\_ I keep my emotions to myself.
3. \_\_\_ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
4. \_\_\_ When I am feeling *positive* emotions, I am careful not to express them.
5. \_\_\_ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
6. \_\_\_ I control my emotions by *not expressing them*.
7. \_\_\_ When I want to feel more *positive* emotion, I *change the way I'm thinking about the situation*.
8. \_\_\_ I control my emotions by *changing the way I think about the situation I'm in*.
9. \_\_\_ When I am feeling *negative* emotions, I make sure not to express them.
10. \_\_\_ When I want to feel less *negative* emotion, I *change the way I'm thinking about the situation*.

#### **Ruminative Response Scale (Rumination)**

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you *generally* do, not what you think you should do.

1 almost never 2 sometimes 3 often 4 almost always

1. think about how alone you feel
2. think "I won't be able to do my job if I don't snap out of this"
3. think about your feelings of fatigue and achiness
4. think about how hard it is to concentrate
5. think "What am I doing to deserve this?"
6. think about how passive and unmotivated you feel.
7. analyze recent events to try to understand why you are depressed
8. think about how you don't seem to feel anything anymore
9. think "Why can't I get going?"
10. think "Why do I always react this way?"
11. go away by yourself and think about why you feel this way
12. write down what you are thinking about and analyze it
13. think about a recent situation, wishing it had gone better

14. think "I won't be able to concentrate if I keep feeling this way."
15. think "Why do I have problems other people don't have?"
16. think "Why can't I handle things better?"
17. think about how sad you feel.
18. think about all your shortcomings, failings, faults, mistakes
19. think about how you don't feel up to doing anything
20. analyze your personality to try to understand why you are depressed
21. go someplace alone to think about your feelings
22. think about how angry you are with yourself

### **Brief COPE (Distraction)**

These items deal with ways you've been coping with the stress in your life since you found out you were going to have to have this operation. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

- 1 = I haven't been doing this at all
- 2 = I've been doing this a little bit
- 3 = I've been doing this a medium amount
- 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.

19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.



## Appendix M

### Study 2 Variables Associated with Mental Health Questionnaires

#### **Center for Epidemiologic Studies Depression Scale (CES-D) (Depressive Symptoms)**

Instructions: Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way **during 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)

1. I was bothered by things that usually don't bother me.
2. I did not feel like eating; my appetite was poor.
3. I felt that I could not shake off the blues even with help from my family or friends.
4. I felt I was just as good as other people.
5. I had trouble keeping my mind on what I was doing.
6. I felt depressed.
7. I felt that everything I did was an effort.
8. I felt hopeful about the future.
9. I thought my life had been a failure.
10. I felt fearful.
11. My sleep was restless.
12. I was happy.
13. I talked less than usual.
14. I felt lonely.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people disliked me.
20. I could not get "going."

#### **Deliberate Self-Harm Inventory (Gratz, 2001) (Self-harm behaviours)**

This questionnaire asks about a number of different things that people sometimes do to hurt themselves. Please be sure to read each question carefully and respond honestly. Often, people who do these kinds of things to themselves keep it a secret, for a variety of reasons. However, honest responses to these questions will provide us with greater understanding and knowledge about these behaviours and the best way to help people. Please answer yes to a question only if you did the behaviour intentionally, or on purpose, to hurt yourself. Do not respond yes if you did something accidentally (e.g., you tripped and banged your head by accident). Also, please be assured that your responses are completely anonymous.

1. Have you ever intentionally (i.e., on purpose) cut your wrist, arms, or other area(s) of your body (without intending to kill yourself)? (select one):

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

2. Have you ever intentionally (i.e., on purpose) burned yourself with a cigarette?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

3. Have you ever intentionally (i.e., on purpose) burned yourself with a lighter or a match?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

4. Have you ever intentionally (i.e., on purpose) carved words into your skin?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

5. Have you ever intentionally (i.e., on purpose) carved pictures, designs, or other marks into your skin?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

6. Have you ever intentionally (i.e., on purpose) severely scratched yourself, to the extent that scarring or bleeding occurred?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

7. Have you ever intentionally (i.e., on purpose) bit yourself, to the extent that you broke the skin?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

8. Have you ever intentionally (i.e., on purpose) rubbed sandpaper on your body?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

9. Have you ever intentionally (i.e., on purpose) dripped acid onto your skin?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

10. Have you ever intentionally (i.e., on purpose) used bleach, comet, or oven cleaner to scrub your skin?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

11. Have you ever intentionally (i.e., on purpose) stuck sharp objects such as needles, pins, staples, etc. into your skin, not including tattoos, ear piercing, needles used for drug use, or body piercing?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

12. Have you ever intentionally (i.e., on purpose) rubbed glass into your skin?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

13. Have you ever intentionally (i.e., on purpose) broken your own bones?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

14. Have you ever intentionally (i.e., on purpose) banged your head against something, to the extent that you caused a bruise to appear?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

15. Have you ever intentionally (i.e., on purpose) punched yourself, to the extent that you caused a bruise to appear?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

16. Have you ever intentionally (i.e., on purpose) prevented wounds from healing?

1. Yes            2. No

If yes,

How old were you when you first did this? \_\_\_\_\_

How many times have you done this? \_\_\_\_\_

When was the last time you did this? \_\_\_\_\_

How many years have you been doing this? (If you are no longer doing this, how many years did you do this before you stopped?) \_\_\_\_\_

Has this behaviour ever resulted in hospitalization or injury severe enough to require medical treatment? \_\_\_\_\_

17. Have you ever intentionally (i.e., on purpose) done anything else to hurt yourself that was not asked about in this questionnaire? If yes, what did you do to hurt yourself?

\_\_\_\_\_

### **Suicidal Ideation Attributes Scale (SI-DAS) (Suicidal Ideation)**

1. In the past month, how often have you had thoughts about suicide?  
Never            0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10            Always
  
2. In the past month, how much control have you had over these thoughts?  
No control      0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10            Full control
  
3. In the past month, how close have you come to making a suicide attempt?  
Not at all close 0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10            Have made an attempt
  
4. In the past month, to what extent have you felt tormented by thoughts about suicide?  
Not at all        0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10            Extremely
  
5. In the past month, how much have thoughts about suicide interfered with your ability to carry out daily activities, such as work, household tasks or social activities?  
Not at all        0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10            Extremely

**Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (Psychological Wellbeing)**

Below are some statements about feelings and thoughts.

Please tick the box that best describes your experience of each over the last 2 weeks

<b>STATEMENTS</b>	<b>None of the time</b>	<b>Rarely</b>	<b>Some of the time</b>	<b>Often</b>	<b>All of the time</b>
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been feeling interested in other people	1	2	3	4	5
I've had energy to spare	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling good about myself	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been feeling confident	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5
I've been feeling loved	1	2	3	4	5
I've been interested in new things	1	2	3	4	5
I've been feeling cheerful	1	2	3	4	5

## Appendix N

### Study 2 Other Questionnaires

#### Personal Attributes Questionnaire (Spence, Helmreich & Stapp, 1973) (Gender roles)

**Instructions:**

The items below inquire about what kind of person you think you are. Each item consists of a PAIR of characteristics, with the letters A-E in between. For example,

Not at all artistic A.....B.....C.....D.....E Very artistic

Each pair describes contradictory characteristics - that is, you cannot be both at the same time, such as very artistic and not at all artistic.

The letters form a scale between the two extremes. You are to choose a letter which describes where YOU fall on the scale. For example, if you think that you have no artistic ability, you would choose A. If you think that you are pretty good, you might choose D. If you are only medium, you might choose C, and so forth.

M-F	1.	Not at all aggressive	A.....B.....C.....D.....E	Very aggressive*
M	2.	Not at all independent	A.....B.....C.....D.....E	Very independent*
F	3.	Not at all emotional	A.....B.....C.....D.....E	Very emotional*
M-F	4.	Very submissive	A.....B.....C.....D.....E	Very dominant*
M-F	5.	Not at all excitable in a major crisis*	A.....B.....C.....D.....E	Very excitable in a major crisis
M	6.	Very passive	A.....B.....C.....D.....E	Very active*
F	7.	Not at all able to devote self completely to others	A.....B.....C.....D.....E	Able to devote self completely to others*
F	8.	Very rough	A.....B.....C.....D.....E	Very gentle*
F	9.	Not at all helpful to others	A.....B.....C.....D.....E	Very helpful to others*
M	10.	Not at all competitive	A.....B.....C.....D.....E	Very competitive*
M-F	11.	Very home oriented	A.....B.....C.....D.....E	Very worldly*
F	12.	Not at all kind	A.....B.....C.....D.....E	Very kind*
M-F	13.	Indifferent to others= approval*	A.....B.....C.....D.....E	Highly needful of others' approval
M-F	14.	Feelings not easily hurt*	A.....B.....C.....D.....E	Feelings easily hurt
F	15.	Not at all aware of feelings of others	A.....B.....C.....D.....E	Very aware of feelings of others*
M	16.	Can make decisions easily*	A.....B.....C.....D.....E	Has difficulty making decisions
M	17.	Gives up very easily	A.....B.....C.....D.....E	Never gives up easily*



M-F	18.	Never cries*	A.....B.....C.....D.....E	Cries very easily
M	19.	Not at all self-confident	A.....B.....C.....D.....E	Very self-confident*
M	20.	Feels very inferior	A.....B.....C.....D.....E	Feels very superior*
F	21.	Not at all understanding of others	A.....B.....C.....D.....E	Very understanding of others*
F	22.	Very cold in relations with others	A.....B.....C.....D.....E	Very warm in relations with others*
M-F	23.	Very little need for security*	A.....B.....C.....D.....E	Very strong need for security
M	24.	Goes to pieces under pressure	A.....B.....C.....D.....E	Stands up well under pressure*

### MCSDS (Social Desirability)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true* or *false* as it pertains to you personally. It is best to answer the following items with your first judgment without spending too much time thinking over any one question.

Please circle "True" if the statement is true, and circle "False" if the statement is false to you personally.

1. It is sometimes hard for me to go on with my work if I am not encouraged.  
**True      False**
2. I sometimes feel resentful when I don't get my way.  
**True      False**
3. On a few occasions, I have given up doing something because I thought too little of my ability.  
**True      False**
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.  
**True      False**
5. No matter who I'm talking to, I'm always a good listener.  
**True      False**
6. There have been occasions I took advantage of someone.  
**True      False**
7. I'm always willing to admit it when I make a mistake.  
**True      False**
8. I sometimes try to get even rather than forgive and forget.  
**True      False**
9. I am always courteous, even to people who are disagreeable.  
**True      False**
10. I have never been irked when people expressed ideas very different from mine.  
**True      False**
11. There have been times when I was quite jealous of the good fortune of others.  
**True      False**
12. I am sometimes irritated by people who ask favors of me.  
**True      False**
13. I have never deliberately said something that hurt someone's feelings.  
**True      False**

## Appendix O

### Study 2 Velten Mood Induction

Please read through the following sentences. As you are reading, try to let the sentences change how you feel.

I feel pretty good right now.

I feel happy.

I feel cheerful, confident.

I can think quickly and clearly right now.

Right now, I feel very contented.

Right now, I feel like smiling.

I feel alert, happy and full of energy.

I have a feeling of lightness and joy.

I really like this light-hearted feeling.

I can feel a smile on my face.

I feel so good I almost feel like laughing.

It feels great to be alive!

## Appendix P

### Study 2 Debriefing Sheet

## Debrief Sheet

### Dealing with feelings: An emotional picture study

Thank you for taking part in this study.

Emotion regulation (ER) refers to the different ways that people manage their emotions, including how and when emotions are experienced. There is evidence that there are differences in the way that men and women regulate their emotions. The purpose of this study was to find out if emotion regulation is associated with mental health, wellbeing, and behaviours such as self-harm, and to find out if this association is different for men and women. When you took part in the picture task, this helped us to find out how well you can use different emotion regulation strategies, such as distraction, to manage your emotions in response to emotional pictures.

**If you are concerned or worried about anything that was brought up in the study, then you may wish to talk to someone about this.**

You may find it helpful to talk to your GP. If you can't or don't want to talk to your GP, then it can be helpful to phone a helpline. Helplines can provide expert advice, information or a friendly ear. Phone numbers for some helplines are listed below, along with their websites:

#### Samaritans

Samaritans is a charity which focuses on providing emotional support to anyone in emotional distress. They can provide excellent support if you are feeling suicidal, or if you are finding it difficult to cope. They have information on their website about signs to look for if you're struggling to cope (<http://www.samaritans.org/how-we-can-help-you/what-speak-us-about/signs-you-may-be-struggling-cope>). They provide a 24-hour, confidential phone service, and you can contact them for free by phoning 116 123 from any phone. If you are worried about anything, this is a safe space to talk about it.

#### Breathing Space

Breathing Space is a free, confidential, phone service for anyone in Scotland experiencing low mood, depression or anxiety. The aim of Breathing Space is to be there for people in times of difficulty, to provide a safe and supportive space by listening, offering advice and providing information. You can phone Breathing Space on 0800 83 85 87, or find out information about a range of issues on their website (<http://breathingspace.scot/>).

If you have any questions or concerns about this project, please feel free to contact me or my supervisor. Your participation in this study is greatly appreciated.

The data from this study will be stored in a password-protected computer and will only be accessed and analysed by the named researchers. Data will be kept for a period of at least 5 years after which it will be securely destroyed.

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