

EMOTION REGULATION PROCESS
IN DISTRESS AND FEAR LIABILITIES:
MALADAPTIVE EVALUATION OF REGULATORY STRATEGIES

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The contribution of emotion regulation in the development and maintenance of psychopathology has repeatedly been highlighted in the literature and a substantial amount of work has been conducted about the specific regulatory strategies individuals with different forms of psychopathology employ (Gross, 2015). However, current research has focused attention on the relationship between emotion regulation and specific mental disorders as they are defined in the predominant nosological system (*Diagnostic and Statistical Manual of Mental Disorders, 5th edition [DSM-5]*; APA, 2013). However, this method of conceptualizing mental illness has received criticism due to its categorical view of psychopathology (Krueger & Markon, 2006a). Additionally, empirical research has largely disregarded the mechanism through which emotion generation leads to the use of specific regulatory strategies and the contribution of this mechanism to the expression of psychopathology (Sheppes, Suri, & Gross, 2015). These gaps in existing literature motivated the current study, which aimed to examine how emotion regulation is manifested in individuals with strong liability toward internalizing difficulties (e.g., depression and specific phobias). The liberation from the diagnostic categories of the current nosological system may provide a better understanding of the mechanism through which emotion regulation is expressed in the broad range of internalizing psychopathology and how the emotion regulation process manifests in the higher-order liabilities underlying internalizing disorders (Krueger & Markon, 2006a).

Conceptualization of Psychopathology

Current nosological systems. Most psychopathology research to date is guided by the conceptualization of psychopathology adopted by the current nosological systems, the

Diagnostic and Statistical Manual of Mental Disorders (DSM) and the *International Classification of Diseases (ICD)*. These nosological systems conceptualize mental disorders as discrete categorical entities. In these diagnostic manuals, several categories of mental disorder are listed, the membership in which depends on whether an individual meets a number of suggested criteria (APA, 2013; WHO, 2016). Thus, an individual is either a member or nonmember of these categories (Krueger & Markon, 2006a). The DSM-5 acknowledged the limitations of this approach and provided several assumptions that needed to be met in order for this categorization to be valid. Specifically, they said that a categorical approach to classification works best when there is diagnostic group homogeneity, when the boundaries between diagnostic categories are clear, and when the different diagnostic categories are mutually exclusive (APA, 2013).

However, research has shown that the assumptions guiding these classification systems are problematic. First, diagnostic categories are highly heterogeneous with individuals classified similarly despite wide differences in the number and nature of their symptoms (Sanislow et al., 2010). Second, evidence from taxometric analyses suggests that most of the DSM disorders are underpinned by dimensions, not categories (Rowa, Hood, & Antony, 2013). Consequently, the boundaries imposed across the different categories may be arbitrary cut-offs on domains of functioning (Widiger & Samuel, 2005). Third, the high levels of comorbidity (or covariation) of mental disorders, with the rate dramatically increasing across the lifespan, raises questions about the core features of the multiple diagnoses (Widiger & Samuel, 2005). Although discussions in the scientific community urged a departure from this conceptualization of psychopathology, a categorical classification system prevailed again with the introduction of the DSM-5 (APA, 2013). This impedes not only scientific research on the etiology and nature of

psychopathological difficulties, but also the effective treatment of these difficulties in clinical settings.

Alternative conceptualizations: dimensional models. Limitations of the dominant categorical conceptualization of psychopathology have led to the consideration of alternative conceptualizations. A dimensional approach has been proposed as an attempt to overcome the problems of comorbidity between- and heterogeneity within the diagnostic categories. Specifically, conceptualizing psychopathology as variations in multiple dimensions of disordered thought, affect, and behavior, allows for modeling comorbidity as a pattern of elevations in different dimensions (Krueger, Watson, & Barlow, 2005). Additionally, adopting a dimensional approach could better address issues of heterogeneity by isolating correlates of specific dimensions in models that control for the influence of other psychopathological dimensions (Krueger, Watson, & Barlow, 2005).

In order to explain the comorbidity of mental disorders, Neale and Kendler (1995) developed several multifactorial models. The associated liabilities model that they proposed, in which comorbidity arises as a result of the correlation of the risk factors of these disorders, was the starting point for the hierarchical dimensional approach in psychopathology. Krueger (1999), adopting a dimensional approach, performed confirmatory factor analyses in patterns of comorbidity among ten common mental disorders and found that a two-factor model had the best fit. The first factor reflected externalizing difficulties and was composed of alcohol dependence, drug dependence, and antisocial personality disorder. The second factor was an internalizing factor composed of internalizing problems. This factor bifurcated to two subdimensions including fear (social phobia, simple phobia, agoraphobia, panic disorder) and anxious-misery (major depression, dysthymia, generalized anxiety disorder). Kendler and colleagues (2003)

confirmed the same factors and demonstrated that the comorbidity in internalizing and externalizing disorders, and within anxious-misery and fear disorders are driven primarily by shared genetic factors.

Internalizing-externalizing transdiagnostic factor model. The model proposed by Krueger (1999) and Kendler and colleagues (2003) is a liability spectrum model in which the multiple disorders are understood as manifestations of latent liability factors (Eaton, Rodriguez-Seijas, Carragher, & Krueger, 2015; Krueger & Markon, 2006b). Krueger and Markon's (2006b) meta-analysis of multivariate studies supported the two-factor liability model for internalizing and externalizing dysfunctions with internalizing bifurcating in fear and distress liabilities. These liabilities were conceived as indirectly observed or latent natural tendencies to develop directly observed or manifest disorders, and evidence for their continuity was provided (Krueger & Markon, 2006b). This model allows for the transcendence of the distinction between normal and abnormal phenomena and views psychopathology as variations in normal-range personality traits (Krueger et al., 2007). The externalizing liability is thought to underlie disorders, such as conduct disorder, antisocial personality disorder, and addictive disorders, linked to disinhibitory traits (Krueger & Markon, 2006b). The distress liability of the internalizing spectrum is thought to underlie major depression, dysthymia, and generalized anxiety disorder, whereas the fear liability is thought to underlie social anxiety disorder, panic disorder, and specific phobias (Krueger & Markon, 2006b).

The two subordinate liabilities of the internalizing spectrum, which will be the focus of the proposed study, are thought to be correlated but separable factors. They are linked to high levels of distress/negative affect and trait neuroticism (Barlow et al., 2014; Brown et al., 1998; Griffith et al., 2010; Zinbarg & Barlow, 1996; Watson, 2009). The distress liability has been

strongly related to demoralization, characterized by unhappiness, dysphoric mood, sense of helplessness and inability to cope with one's current circumstances, and general dissatisfaction with one's condition (Sellbom et al., 2008). The fear liability, on the other hand, has been strongly linked to negative activation or dysfunctional negative emotions and fearfulness related to avoidance (Sellbom et al., 2008). Thus, emotional dysfunctions are thought to be the core of both of these liabilities.

Emotion and Emotion Regulation

Emotions have been studied in a wide range of mental disorders, and especially in internalizing disorders (Berenbaum et al., 2003; Kring, 2008). They have been defined as internal processes that attempt to promote adaptation. They are generated through stages, including attending to a situation, giving a valenced meaning, and responding experientially, behaviorally, and physiologically (Berenbaum et al., 2003; Sheppes, Suri, & Gross, 2015). According to Gross (2015), emotions are under the umbrella of affect, a general category including stress responses (i.e., unspecified affective responses to situations perceived as unmanageable), moods (i.e., diffuse, long lasting, valenced states), and emotions (i.e., short-lived valenced states elicited by specific events). Since emotions were developed through human evolution to prepare for action in response to environmental stimuli, they generally have adaptive nature and serve important inter- and intra-personal functions (Kring, 2008). However, emotions can become maladaptive depending on the degree of emotional valence, emotional intensity, and disconnection (e.g., facial expressions are not compatible with the subjective experience of emotion) disturbances (Berenbaum et al., 2003). Generally, in order to regulate maladaptive emotional experiences, individuals modify them through emotion regulation processes.

Various conceptualizations of emotion regulation have been proposed (Bloch, Moran, &

Kring, 2010). Several scholars conceptualize emotion generation and emotion regulation as inseparable processes and suggest that all types of emotion are likely regulated to some extent (e.g. Campos, Frankel, & Camras, 2004; Davidson, 2000). Others support that differentiating between emotion generation and emotion regulation is important to understand the nature of emotion-related problems, and emotion-related disturbances in psychopathology (Bloch, Moran, & Kring, 2010). Gross et al. (1998, p. 275), who aligns with the latter group of scholars, proposed the most influential definition which views emotion regulation as the “processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions.” Again, emotion regulation can be seen as part of the general umbrella of affect regulation which involves our efforts to influence our negative or positive states (Gross, 2015). Affect regulation includes coping (i.e., long lasting efforts directed to the alleviation of stress), mood regulation (i.e., efforts to alter subjective feeling states), and emotion regulation (i.e., efforts to alter specific emotions and the related behavioral responses). Emotion regulation is thought to take place when there is an activation of a goal that recruits one or more processes to influence emotion generation (Fernandez, Jazaieri, & Gross, 2016; Sheppes, Suri, & Gross, 2015) with ultimate goal to appropriately respond to environmental demands (Campbell-Sills & Barlow, 2007; Cole, Martin, & Dennis, 2004; Gratz & Roemer, 2004; Gross, 1998; Thompson, 1994). The target of this regulatory goal can be intrinsic, aiming at a change in the person who experiences the emotion, or extrinsic, targeting a change to someone else (Gross, 1998). The motivation can be short-term or long-term and aim to a decrease or increase of the facets of the emotional responding (intensity, duration, frequency; Gross, 1998).

Emotion regulation is not inherently adaptive or maladaptive (Gratz & Roemer, 2004). It is considered adaptive when the person achieves to influence emotion generation in the desired

way, containing the emotion experience sufficiently to continue engaging in goal-directed behaviors (Fernandez, Jazaieri, & Gross, 2016). On the other hand, emotion regulation can become maladaptive, when the person fails to influence the emotion generation process, either by failing to engage in emotion regulation or by using inadequate strategies for the situation leading to under-regulation or over-regulation of emotion (Fernandez, Jazaieri, & Gross, 2016).

The role of emotion regulation deficits in the development of psychopathology has long been emphasized in the literature (Gross, 2015). Previous studies attempting to identify the mechanisms through which emotion regulation contributes to the emergence or maintenance of psychopathology primarily focused attention on the regulatory strategies that individuals with psychopathology tend to use (Sheppes, Suri, & Gross, 2015). Emotion regulation strategies are the approach that individuals adopt in order to up-regulate (increase magnitude of the emotional response) or down-regulate (decrease the magnitude of the emotional response) their emotions (Kooze, 2009). Over the years, different theoretical models have highlighted different specific strategies with respect to their efficacy to regulate emotion, that often have been classified as adaptive or maladaptive (Aldao et al., 2010). However, adaptiveness and maladaptiveness of regulatory strategies seem to highly depend on contextual factors (Aldao, 2013; Troy, Shallcross, Mauss, 2013).

Theoretical models of emotion regulation. The most prominent theory for emotion regulation is the process model of emotion regulation (Gross, 1998). This model is based on an information processing framework and describes five general regulatory strategies that individuals use to regulate emotion in a specific time point during the emotion generation process. Specifically, the person might choose to regulate at a very early stage of the generation process aiming to change the complete course of an emotional situation (e.g., avoid situations;

situation selection). At a later stage, the person may choose to change external features of the situation to modify its emotional impact (e.g., shorten the exposure time to the situation; situation modification). Alternatively, the person may decide to change focus to another aspect of a situation and to modify information processing (e.g., distract oneself from the situation; attentional deployment) or he/she may change the meaning of a situation (e.g., reappraisal of the emotional meaning; cognitive change). Finally, the person may choose to regulate at the latest stage of the emotion generation process, through response modulation, i.e. to modify experiential, behavioral, physiological components of the elicited responses (e.g., expressive suppression; Gross, 1998).

This model has two important strengths. First, it identifies distinct processes in the emotion regulation framework which can be studied separately in psychopathology research (Bloch, Moran, & Kring, 2010). Second, this model allows for consideration of deficits in self as well as deficits related to influences in others (Bloch et al., 2010). These advantages have led researchers who study the relationship between emotion regulation and psychopathology to prefer the process model conceptualization of emotion regulation (Bloch et al., 2010). However, accumulated research in the field of emotion regulation demonstrated that between emotion generation and the implementation of specific strategies other processes take place (Gross, 2015; Sheppes et al., 2015). These processes need to be incorporated in the theoretical model in order to more fully understand emotion regulation and its influence on adaptive and maladaptive behavior (Bonanno, & Burton, 2013). Based on this premise, Sheppes, Suri, and Gross (2015) developed the extended process model.

According to the extended process model, emotion generation leads to emotion regulation through a valuation process, in other words a process involving the determination of value of a

number of available, emotionally charged, options (Sheppes, Suri, & Gross, 2015). This process involves multiple valuation systems, each of which includes an initial stimulus, and the elements of Perception, Valuation, and Action. Specifically, internal or external stimuli (World) give rise to Perception. After perceived, these stimuli are valued as either positive or negative (Valuation) and activate specific Actions (Sheppes, Suri, & Gross, 2015). The output of one Valuation cycle becomes the initial stimulus for another. Thus, the mechanism of emotion regulation involves the alternation of several valuation systems (regulatory stages) that give rise to one another through the processes of perception, valuation and action (Sheppes, Suri, & Gross, 2015).

The regulatory stages that lead from emotion generation to emotion change are three interacting valuation systems (i.e., identification, selection, and implementation regulatory stages) iterating across time enabling the monitoring of the process (Gross, 2015). Each of these stages results in a regulatory decision (Sheppes, Suri, & Gross, 2015). Specifically, the identification valuation system involves the decision to regulate or not; the selection stage involves the decision of which available general regulatory category to use; and, the implementation valuation system entails the decision to implement a specific regulatory tactic. Each of these Valuation systems includes the basic elements of Perception, Valuation, and Action, allowing for more process specificity (Sheppes, Suri, & Gross, 2015). Sheppes, Suri, and Gross (2015) suggested that the different psychopathological problems might relate to deficits in the three basic elements in each of the three regulatory stages.

An example of this process in real life is the following. A person is being fired by her supervisor. This situation elicits sadness, which is the result of her emotion-generative process (world). In the identification stage this emotion, i.e., sadness, is being detected (perception step). After its detection, through an evaluation process (valuation step), the person determines whether

this emotion is adequately negative and, thus, whether it needs to be regulated. If sadness elicited by the person's firing is valued sufficiently negative, a regulation goal will be activated (action step). The output of the identification stage (i.e., the activation of the sadness regulation goal) constitutes the world step for the selection stage. Sadness will be regulated via an emotion regulation strategy. Attentional deployment and cognitive change are the available strategies for sadness regulation represented in this person's working memory (perception step). She decides that attentional deployment is the most suitable strategy to use, because the level of her sadness is too intense (valuation step). Therefore, the goal of using attentional deployment is being activated (action step) and the output of this process constitutes the input for the implementation stage. In the perception step, this person perceives the different tactics that would help her shift her attention, such as distracting herself by watching a movie or reading her favorite novel. In the valuation step, she assigns values to these available tactics and decides that watching a movie would more effectively distract her and, thus, better help her regulate her sadness. Through the implementation of this tactic her sadness is being regulated (action step). After the initial implementation of the regulatory tactic, this person monitors its effectiveness across time and activates new regulation goals if necessary.

Emotion Regulation Process and Psychopathology

Thus far, research regarding the role of emotion regulation on psychopathology disregards two main points. First, current empirical research has focused attention on the action element of the implementation stage in the regulatory process, which is the application of inappropriate regulatory strategies (Sheppes, Suri, & Gross, 2015). For example, the maladaptive use of rumination (a repetitive focus on the experience of the emotion and its causes and consequences as a strategy to understand and solve an individuals' problems), as well as

avoidance (the avoidance of emotions and thoughts to reduce distress) have been implicated in the etiology of several internalizing disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010). However, although valuable, research focusing solely on the implementation stage of emotion regulation (i.e., studying the specific strategy that the individual implements) overlooks the mechanism leading to the use of this strategy. Second, current research has put effort on explicating the relationships between emotion regulation and several DSM-defined mental disorders, with scarce study on the commonalities within psychopathology liabilities (i.e., internalizing and externalizing spectra). Restricting research to specific disorders deters from identifying an emotion regulation mechanism that disorders with common underlying liabilities share. In an effort to contribute to this line of research and address these gaps in the literature, the current study attempted to isolate the valuation element in the selection stage of emotion regulation and its relationship with the distress and fear liabilities.

Adaptive valuation in the selection stage. An adaptive valuation element in the selection stage involves the accurate assignment of weights in the different general regulatory strategies based on the perceived benefits and costs of each strategy that were acquired through past experience (Sheppes et al., 2014; 2015). Several factors that influence the assignment of specific weights are cognitive resources (e.g., cognitive control abilities; Urry & Gross, 2010), physiological resources (e.g. availability of blood glucose; Baumeister, 2003; Beedie & Lane, 2012), type and strength of the emotional impulse (e.g., increased stress exposure; Raio, Orederu, Palazzolo, Shurick, & Phelps, 2013; Sheppes & Gross, 2011), and motivational factors (e.g., short-term versus long-term goals; Sheppes & Gross, 2011).

Choosing to regulate emotion in an earlier or later temporal point in the emotion generation process has different costs and benefits. For example, Sheppes et al. (2011, 2014)

using the emotion regulation choice paradigm tested factors that influence the selection of two major strategies: reappraisal, as a form of cognitive change, and distraction, as a form of attentional deployment (Sheppes et al. 2011, 2014). This paradigm isolated the Valuation element in the selection regulatory stage by examining how differential weights are assigned to the two regulatory strategies, based on a cost-benefit analysis. Distraction, which involves the inhibition of emotional information (and, thus, early disengagement from the emotional information) before it escalates, provides the advantage of successful modification of high-intensity emotional information (Sheppes et al. 2011, 2014). Additionally, in the cognitive domain, distraction entails the activation of relatively simple processes, since the content of the alternative thoughts generated to distract attention from the situation is neutral and, therefore, not conflicting with the original emotional information. However, a disadvantage of this regulatory strategy is that, motivationally, it does not enable processing, evaluating, and preserving emotional information in the long-term memory. Such emotional information could potentially promote one's long-term goals and adaptation (Sheppes et al. 2011, 2014).

On the other hand, the benefits of reappraisal, which involve engagement with emotional information, motivationally include the enabling of processing, evaluating, and remembering emotional information, which are crucial for long-term goals and adaptation (Sheppes et al. 2011, 2014). One cost of reappraisal is that it is emotionally costly, as it can less successfully inhibit high-intensity emotional information. This is because it requires elaborated semantic processing that occurs prior to late modulation. In the cognitive domain, a cost of reappraisal is that it requires the activation of relatively complex processes due to the requirement of producing alternative interpretations of a situation which are in conflict with the initial emotional information. Thus, according to Sheppes et al. (2011, 2014) an adaptive Valuation profile

sensitive to the costs and benefits of each regulatory category involves selecting cognitive change when the intensity of the emotional information is low, when cognitive generation is simple, and when long-term relief is the goal of the emotion regulation. By contrast, individuals favor attentional deployment to cognitive change when emotional intensity is high, when cognitive generation is complex, and when short-term relief is the ultimate goal. A correct cost-benefit analysis increases the likelihood of effective regulation of maladaptive emotion (Gross, 2015; Sheppes et al., 2015).

Maladaptive valuation in fear and distress disorders. Gross (2015) and Sheppes et al. (2015) suggested that deficits in emotion regulation related to psychopathology may arise from problems in the valuation process of the available general regulatory categories. More specifically, a valuation problem may involve erroneous analysis of the costs and benefits of engagement and disengagement emotion regulation strategies depending on contextual factors.

Deficits in valuation in fear disorders. Regarding fear disorders, there is evidence to suggest that individuals who are prone to fear may have the tendency to deviate from choosing to engage in low-intensity emotional information when long term relief is the ultimate goal (or, in other words, maladaptive weighing of the motivational costs of distraction). Research has demonstrated that individuals diagnosed with specific phobias, social anxiety, and panic disorder have a tendency to disengage from fear-provoking emotional information (Cisler & Koster, 2010; Garner et al., 2006; Mogg et al., 2004; Pflugshaupt et al., 2005). Specifically, there is evidence to suggest that individuals with fear disorders tend to demonstrate attentional bias toward threat, which refers to the differential allocation of attention in threatening versus neutral stimuli (Cisler & Koster, 2010). For the purposes of this discussion, it is useful to differentiate between early stage information processing biases, that occur early in the processing of threat

cues, and late stage processing biases that occur later in the process (Cisler & Koster, 2010). Individuals with fear disorders tend to direct attention toward the threatening information at an early stage of the process, but increased exposure to this information results in shifting attention away from it (Cisler & Koster, 2010; Koster et al., 2005). Attentional avoidance is the tendency to allocate attention to aspects of experience in the opposite direction of the threat cue (Koster et al., 2005; Mogg et al., 2004). Attentional avoidance of threat in specific and social phobias, and panic disorders have been demonstrated through measuring eye fixations in studies using the dot probe task, the exogenous cueing task, and the visual search task (Garner et al., 2006; Mogg et al., 2004; Pflugshaupt et al., 2005). Thus, attentional avoidance among fearful individuals may reflect an attempt to strategically regulate negative affect through disengaging from fear-provoking stimuli (Cisler & Koster, 2010).

Research has also shown that individuals with fear disorders often demonstrate an overreliance on experiential avoidance, which involves an effort to avoid, escape, or hide unpleasant emotions or thoughts (Hayes et al., 1996), as a regulation strategy in fear provoking situations. For example, Kashdan and colleagues (2013) found that participants with social anxiety disorder adopted experiential avoidance more often in social interactions in their daily life compared to control participants. Additionally, individuals with panic disorder have been found to adopt experiential avoidance related to bodily arousal (Kashdan & Rottenberg, 2010).

Lastly, it has been suggested that individuals diagnosed with fear disorders tend to overgeneralize their disengagement responses to emotional stimuli of lower emotional intensity and to situations involving emotional information, attendance of which is required for goal-directed behavior (e.g., when a socially anxious person needs to attend an interview – a fear provoking situation – to secure a job) (Campbell-Sills, & Barlow, 2007; Foa, & Kozak, 1986).

Although useful for short-term relief, disengagement strategies like distraction from an emotional experience can perpetuate fear (Sheppes et al., 2014). For example, in the case of social anxiety disorder, it has been suggested that socially anxious individuals tend to overvalue avoidance, even when the short-term relief associated with avoiding a social engagement comes at a longer-term price (Gross, 2015).

Deficits in valuation in distress disorders. Deviation from choosing to disengage from high-intensity emotional stimuli may be seen in individuals who are prone to distress, who may not be sensitive to the costs of engagement in high-intensity emotional information (i.e., it is less successful in blocking high-intensity emotional information). The increased preference for engagement with high-intensity emotional information in individuals with disorders characterized by high distress is evident by the increased use of rumination as a strategy to regulate negative emotion (Sheppes et al. 2012).

Rumination is the tendency to over-attend to an emotional experience and process its meaning and consequences repetitively (Nolen-Hoeksema, 1991). Cognitive reappraisal is the process by which an individual attends to an emotion arousing experience and attempts to transform its meaning, as a result of changing the way that an individual thinks about this experience (Gross, 1998). A common characteristic of rumination and reappraisal is the involvement of attending to the emotional information elicited by a situation and the active processing of its negative meaning (Cohen et al., 2014). Therefore, in both reappraisal and rumination a focus on the emotional information is central, in which distressed individuals engage in excess. Although seemingly very different, research has suggested that a shared cognitive mechanism and neural basis may underlie these two strategies (Cohen et al., 2014; Ray et al., 2005). This mechanism might include the participation of inhibition, working memory

updating, and set shifting (Cohen et al., 2014; McRae et al., 2012; Whitmer and Gotlib, 2013).

However, the literature suggests that rumination is a maladaptive strategy that perpetuates negative emotion, whereas reappraisal is generally adaptive and related to successful emotion regulation (Aldao, Nolen-Hoeksema, & Schweizer, 2010). It has been suggested that individuals diagnosed with distress-related disorders may remain trapped in a cycle of rumination in an effort to understand themselves and their emotional experience (Papageorgiou & Wells, 2003; Simpson & Papageorgiou, 2003), failing, therefore, to effectively implement reappraisal and alter the emotional response. Thus, it is plausible that high in distress individuals attempt to use reappraisal to downregulate emotion (and potentially in excess since they tend to seek engagement in the emotional experience), but they may not succeed in their effort to successfully implement it and this failure may happen through a difficulty in breaking the vicious cycle of rumination.

Cohen et al. (2014), based on existing research, proposed a bidirectional relationship between the ability to inhibit negative emotion and the two emotion regulation strategies. Specifically, it is thought that inhibition, defined as the ability to suppress automatic responses with purpose the effective engagement in goal-directed behavior (Friedman & Miyake, 2004), has a causal relationship with these strategies, positive with reappraisal (Cohen et al., 2012; Joormann and Gotlib, 2010; Ochsner & Gross, 2005) and negative with rumination (Salas et al., 2014). In turn, habitual use of these two strategies may lead to enhanced or impaired inhibition (Philippot & Brutoux, 2008). Thus, impaired inhibition may be the link between distress disorders and failure to implement reappraisal.

Additionally, although cognitive reappraisal is mainly utilized to reduce the unpleasant emotional arousal evoked by a stressful event, in high-intensity emotion it may lead to the

increase of negative emotions by allowing an individual to overthink the negative stimulus and perceive it worse than initially (Sheppes et al., 2014). Reappraisal, as a type of cognitive change, generally has been studied as an adaptive emotion regulation strategy, which individuals with emotional disorders usually fail to use. However, literature has for the most part evaluated the implementation of this strategy in individuals with distress-related disorders (Gross, 2015; Sheppes et al., 2015). Individuals with emotional difficulties might indeed fail to use reappraisal. However, this failure might come from the fact that they are trying to use it when in high distress (a usual phenomenon for these individuals) where it is not effective in blocking negative emotion (Raio et al., 2013). What is not clear yet is whether these individuals, and especially those with a strong liability toward distress, have the intention, and attempt, to reappraise as well as under what circumstances. Based on the evidence supporting an excessive preference of persons with distress difficulties to engage in thinking over emotions, one would expect that the distress liability may be associated with lack of differentiation between costs and benefits of engaging with emotion. As a result individuals with higher proneness to distress are expected to use reappraisal more frequently than those with lower proneness to distress, regardless of the intensity of the stimulus and motivational goal.

Current Study

The adoption of specific regulatory strategies in different disorders has been well studied in previous research (Gross, 2015). However, how individuals reach a decision as to what regulatory strategy to employ and how this decision relates to internalizing psychopathology has scarcely been studied. Additionally, existing research studying emotion regulation in the context of psychopathology is restricted to DSM-defined categorical entities, which is related to two problems. First, research has demonstrated that the assumptions guiding the DSM classification

system are problematic and that this categorical system has a limited ability to fully explain psychopathology. Second, restricting research to specific disorders deters from identifying an emotion regulation mechanism that disorders with common underlying liabilities share. In order to address these gaps in the literature, the current study attempted to examine a potential mechanism through which the higher-order internalizing liability may be linked to deficits in the emotion regulation process. More specifically, this study aimed to investigate whether there are deficits in the valuation element of the selection stage of the regulatory process within the internalizing spectrum.

Based on the literature just discussed several specific hypotheses were formulated. First, the literature reviewed previously provides compelling evidence that individuals diagnosed with fear disorders have a tendency to disengage from fear-provoking emotional information, which is shown by their frequent adoption of experiential or attentional avoidance in situations involving these fear provoking stimuli (Cisler & Koster, 2010; Kashdan et al., 2013; Kashdan & Rottenberg, 2010). Additionally, it seems that they overgeneralize these responses to less intense emotional stimuli (Campbell-Sills, & Barlow, 2007; Foa, & Kozak, 1986). Based on this evidence, it was hypothesized that the fear liability is associated with a maladaptive evaluation of available regulatory strategies. More specifically, it was hypothesized that the fear liability would moderate the effect of emotional intensity on strategy selection, such that the effect of emotional intensity on strategy selection would become smaller as standing on the fear liability increased. In other words, at higher levels of the fear liability, the odds of choosing distraction would remain elevated across all levels of emotional intensity. It was also hypothesized that the fear liability would moderate the effect of goal proximity on the odds of choosing distraction, such that the effect of goal proximity on strategy selection would become smaller as standing on

the fear liability increased. In other words, at higher levels of the fear liability, the odds of choosing distraction would remain elevated in both goal proximity conditions.

Second, the research summarized above shows that individuals with disorders characterized by high distress demonstrate an increased preference for excessive engagement in high-intensity emotional information that is evident by their increased use of rumination as a strategy to regulate negative emotion (Sheppes et al., 2012). Given that rumination is thought to share a common mechanism with reappraisal the implementation of which might fail in individuals high in distress because of impaired inhibition (Cohen et al., 2014), it was hypothesized that the distress liability is associated with a maladaptive evaluation of available regulatory strategies. More specifically, it was hypothesized that the distress liability would moderate the effect of emotional intensity on strategy selection such that the effect of emotional intensity on strategy selection would become smaller with the increase of the distress liability. In other words, at higher levels of the distress liability, the odds of choosing reappraisal would remain elevated across all levels of emotional intensity. It was also hypothesized that the distress liability would moderate the effect of goal proximity on the odds of choosing distraction such that the effect of goal proximity on strategy selection would become smaller as standing on the distress liability increased. In other words, at higher levels of the distress liability, the odds of choosing reappraisal would remain elevated in both goal proximity conditions.

To test these hypotheses, the emotion regulation choice paradigm developed by Sheppes and colleagues (2011) was employed. This paradigm isolates the Valuation element in the selection stage of the regulatory process by enabling the investigation of the emotional and motivational factors that play a role in the selection of two regulatory categories: reappraisal (as an engagement regulatory strategy) and distraction (as a disengagement regulatory strategy).

Previous research has shown that individuals from the general population value positively engagement strategies when the intensity of the emotional information is low, and the long-term relief is the goal of the emotion regulation, while they favor disengagement strategies when emotional intensity is high, and short-term relief is the ultimate goal (Sheppes et al., 2014). Therefore, by demonstrating that individuals with strong liability toward internalizing difficulties are not sensitive to the costs and benefits of these strategies, this study can identify deficits in the valuation element of the selection stage in their regulatory process.

Methods

Participants

Participants in the current study were undergraduate students studying at Ball State University. They were selected through the university research pool. In order to ensure that individuals representing the full range of the internalizing liability were solicited for participation, a screening procedure was conducted. Specifically, in order to avoid over-selection of participants in one pole of the internalizing continuum (e.g., participants with very low levels of internalizing), candidate participants completed online self-report measures assessing internalizing-related problems, including the *Beck Depression Inventory* (BDI-II) and the *Beck Anxiety Inventory* (BAI; see description below). Their scores on these measures indicated the level of anxiety or depressive symptomatology that they experience. An effort was made to identify a final sample pool in which half of the participants were closer to the lower end of the continuum and the other half were closer to the higher end of the continuum. Subsequently, an invitation was sent to this final sample pool through email to come to the lab and complete the next phase of the study.

In the first part of the study (online portion), the sample consisted of 675 participants

with mean age = 19 (SD= 1.90, range = 18-49). From those 675 participants, 458 (68%) identified as female, 203 (30%) as male, and 7 (1%) selected “other” in the gender question. Additionally, 526 (78%) participants identified as Caucasian, 73 (11%) identified as African American, 29 (4%) as Hispanic, 3 (0.4%) as Asian and 25 (4%) identified with other nationalities. Finally, the mean BDI-II score for this sample was 14.92 (SD = 10.42) and mean BAI score 11.46 (SD = 9.52).

The final sample that completed the full procedure for the study was 127 participants (28% of the invited students) (mean age = 19.12, SD = 3.02, range = 18-49). From this final sample, 90 (71%) participants identified as female, 34 (27%) as male, and 2 (1.59%) selected “other” in the gender question. Additionally, 93 (74%) participants identified as Caucasian, 15 (12%) as African American, 7 (6%) as Hispanic, 3 (2%) as Asian, and 8 (6%) identified with other nationalities. Finally, the mean BDI-II score for this sample was 16.6 (SD = 10.37) and mean BAI score 12.72 (SD = 9.51).

Materials

Internalizing liability measures. Temperamental as well as fear- and distress-related symptomatology measures were used to create composite scores of the fear and distress liabilities based on the obtainment of factor scores from Confirmatory Factor Analysis (CFA) models (see statistical analysis section for more information about the composite scores creation). The measures used in CFAs to model the two internalizing liabilities are described below. Additionally, the calculated internal consistencies of these scales are presented in Table 1.

Positive and Negative Affect Schedule (PANAS-X). PANAS-X is a 20-item self-report questionnaire measuring levels of dispositional positive (PA) and negative affect (NA) (Watson, Clark, & Tellegen, 1988). It consists of two lists of mood descriptors, ten for PA (e.g., attentive,

interested, alert, excited) and ten for NA (e.g., distressed, upset, hostile) and participants are asked to rate the extent to which they experience each of these feelings. The NA dimension represents levels of subjective distress and unpleasurable engagement subsuming feelings of anger, contempt, disgust, guilt, fear, and nervousness (low NA involves states of calmness and serenity), while PA represents levels of engagement in pleasurable experiences subsuming feelings of enthusiasm, activity, and alertness (low PA involves states of sadness and lethargy; Watson, Clark, & Tellegen, 1988). Each item is rated on a scale ranging from 1 (very slightly or not at all) to 5 (extremely). Previous research has shown that PANAS-X has adequate levels of internal consistency ($\alpha = 0.84-0.90$) and test-retest reliability in non-clinical samples (Crawford & Henry, 2004; Watson et al., 1988). Additionally, research has provided evidence for the validity of this scale. Specifically, confirmatory factor analysis with a large non-clinical sample has shown good fit for the structure of the two factors corresponding to PA and NA (Crawford & Henry, 2004). Evidence for external validity has also been provided, with PANAS-X being correlated with different measures of distress and psychopathology [e.g., Hopkins Symptom Checklist (HSCL), Beck Depression Inventory (BDI), and STAI State Anxiety Scale (A -State) (Watson, Clark, & Tellegen, 1988)]. Moreover, PANAS-X has demonstrated measurement invariance across different demographic groups (Crawford & Henry, 2004).

Minnesota Multiphasic Personality Inventory (MMPI-2). The MMPI-2 is a 567-item self-report questionnaire on which participants are asked to indicate whether statements apply to them by answering “true” or “false” (Butcher et al., 2001). Three scales from the MMPI-2 were used in the proposed study: Demoralization (RCd), Dysfunctional Negative Emotions (RC7), and Fears (FRS) scales. RCd consists of 24 items and represents general distress (Tellegen et al., 2003). RC7 consists of 24 items and is strongly related to stress reactivity, fear, and anger-

hostility. FRS consists of 23 items and assesses several specific fears and a general tendency toward fearfulness. RCd and RC7 correspond to Watson and Tellegen's (1985) pleasantness-unpleasantness and NA affect dimensions, respectively. Research has shown that RCd is a primary marker of distress disorders, whereas RC7 is a primary marker of fear disorders (Sellbom et al., 2008). Previous research has supported the reliability and validity of these scales. More specifically, these scales have shown good internal consistency ($\alpha = 0.72-0.95$; Sellbom et al., 2008; Graham, 2011). Additionally, evidence for convergent validity has been provided by studies showing high correlations with normal range personality traits and symptom measures, such as the Multidimensional Personality Questionnaire (MPQ; Sellbom, & Ben-Porath, 2005) and the Symptom Checklist 90-Revised (SCL-90-R; Ben-Porath, McCully, & Almagor, 1993). Finally, evidence for incremental validity has been provided as large studies have shown that these scales highly predict internalizing-related conditions; Sellbom et al., 2008; Ben-Porath, McCully, & Almagor, 1993).

Beck Hopelessness Scale (BHS). BHS is a 20-item self-report questionnaire measuring three aspects of hopelessness: feelings about the future, loss of motivation, and expectations (Beck & Steer, 1988). The measure comprises 11 negatively phrased and 9 positively phrased items. Participants are asked to indicate whether the statements apply to them or not. The total score is the sum of the individual item scores. Previous research had demonstrated that BHS has adequate internal consistency ($\alpha = 0.82-0.93$) in clinical and nonclinical populations, general psychiatric, forensic psychiatric, and college samples (Beck & Steer, 1988; Chang et al., 1994). Evidence for concurrent validity of BHS has been provided by comparing scale scores of outpatient and hospitalized patients with clinical ratings of hopelessness and with other tests designed to measure negative attitudes about the future ($r = 0.63-0.74$; Beck et al., 1974).

Evidence for predictive validity has been provided by findings showing high correlation between hopelessness scores and depression in college and clinical populations (Alford et al., 1995).

Finally, convergent and discriminant validity has been supported by studies investigating its correlations with selected MMPI-2 scales (Thackston-Hawkins et al., 1994), the Optimism and Pessimism subscales of the Life Orientation Test (Scheier & Carver, 1985), and the Optimism and Pessimism Scale (Dember, Martin, Hummer, Howe, & Melton, 1989).

Beck Depression Inventory (BDI). BDI is a 21-item questionnaire measuring depressive thoughts and attitudes (Beck et al., 1961). In each item participants are asked to choose between four statements of increasing severity. High scores indicate high levels of depression. BDI was used in the screening process of the study to assess the levels of depression symptomatology of participants. This instrument has been widely used in research and clinical practice to assess the intensity of depression in clinical populations and detect depression in non-clinical populations. BDI has demonstrated good psychometric properties. Specifically, a meta-analysis of the BDI's internal consistency estimates yielded a Cronbach's alpha of 0.86 for psychiatric patients and 0.81 for non-clinical samples (Beck, Steer, & Carbin, 1988). Good test-retest reliability has been demonstrated in psychiatric and non-psychiatric populations with estimates in different studies ranging from $r = 0.62$ to 0.90 . Convergent validity has also been supported with BDI scores of psychiatric patients highly correlating with clinical ratings and the Hamilton Psychiatric Rating Scale for Depression (HRSD; 0.72 and 0.73, respectively). In non-clinical samples the correlations with clinical ratings and HRSD scores were 0.60 and 0.74 respectively. Finally, research indicates that the BDI discriminates among different types of depression, and differentiates depression from anxiety (Beck, Steer, & Carbin, 1988).

Beck Anxiety Inventory (BAI). BAI is 21-item self-report questionnaire measuring

symptoms of anxiety, in somatic and cognitive areas (Beck et al., 1988). Participants are asked to indicate the degree to which they agree or disagree with a given statement. Participant responses range from 0 (not at all) to 3 (severely, I could barely stand it). The total score ranges from 0 to 63. This instrument was developed in response to the need for a measure of clinical anxiety that would adequately differentiate from depression compared to other anxiety measures such as the State-Trait Anxiety Inventory (STAI) and the Self-Rating Anxiety Scale (SRAS). The BAI was also used in the screening process of this study. This scale has demonstrated good psychometric properties. Based on psychiatric and outpatient samples BAI has demonstrated high internal consistency ($\alpha = 0.92-0.94$). Additionally, good test-retest reliability has been shown as indicated by the high correlation of the scores of patients from the intake and several days later ranging from $r = 0.67$ to 0.75 (Beck et al., 1988; Fydrich et al., 1992). Concurrent and discriminant validity has also been supported by previous research. Specifically, the BAI was moderately correlated with the revised Hamilton Anxiety Rating Scale ($r = 0.51$) and less correlated with the revised Hamilton Depression Rating Scale ($r = 0.25$; Beck et al., 1988). Additionally, the BAI have been found to discriminate between anxious and non-anxious diagnostic groups.

Fear Questionnaire (FQ). FQ is a 15-item self-report measure consisted of three subscales, each of which includes five items measuring levels of phobic avoidance related to agoraphobia, social phobia, and blood/injury phobia (Marks & Mathews, 1979). Participants are asked to rate each item based on a 9-point scale (0 = would not avoid it, 8 = would always avoid it). Scores range from 0-40 in each subscale and the total score is the sum of the subscales (ranging from 0 to 120). Previous research with clinical samples of phobic patients indicates that FQ has good internal consistency ($\alpha = 0.83$ for the total scale and $0.71-0.81$ for the subscales; Marks & Mathews, 1979; Oei et al., 1991). The test-retest reliability of this scale has been found

adequate ranging from $r = 0.79$ to 0.96 . Factor analysis in a clinical sample of phobic patients has supported the three-factor structure of FQ (Oei et al., 1991).

Adult Temperament Questionnaire-Short Form (ATQ). ATQ-short form is a 77-item self-report measure assessing four dimensions of temperament: effortful control, negative affect, extraversion/surgency, and orienting sensitivity (Evans & Rothbart, 2007). Participants are asked to give their best estimate of how well each statement describes them on a 7-point scale (0 = extremely untrue of you, 7 = extremely true of you). Scores range from 0-7 in each subscale, which is the average of item scores. Each of these dimensions include sub-constructs. Negative affect, which includes the sub-constructs of fear, sadness, discomfort, and frustration, was included in the current study. This instrument has shown good internal consistency ($\alpha = 0.72$ - 0.78 for the scales used in the current study) (Evans & Rothbart, 2007). Additionally, evidence for its structural validity has been provided through Exploratory and Confirmatory Factor Analyses, and for its convergence validity through the examination of its associations with other temperament and personality measures (Evans & Rothbart, 2007).

Demoralization Scale (DS-II). DS-II is a self-report questionnaire intended to measure feelings of hopelessness, helplessness, pessimism, and motivation to cope (Robinson et al., 2016). It consists of 16 items divided into two subscales (8 items each): distress and coping subscale, and meaning and purpose subscale. Participants are asked to report how often they feel a number of feelings in a 3-point scale, including 0 (never), 1 (sometimes), and 2 (often). The total score is calculated by summing individual item scores and it ranges from 0 to 32. Previous research has demonstrated good internal consistency (meaning and purpose in life subscale: $\alpha = 0.84$; distress and coping subscale: $\alpha = 0.82$; total DS: $\alpha = 0.89$) and test-retest reliability (meaning and purpose in life subscale: $r = 0.68$; distress and coping subscale: $r = 0.82$; total DS: r

= 0.80) (Robinson et al., 2016). Additionally, DS-II has shown convergent validity with measures of psychological distress and quality of life and discriminant validity as evidenced by its moderate correlation with depression (Robinson et al., 2016).

Emotion-regulation choice. Participants viewed pictures included in the widely used in affective science *International Affective Picture System* (IAPS; Lang, Bradley, & Cuthbert, 2008). IAPS was developed to provide a set of standardized emotional stimuli that would be used in experimental studies of emotion and attention (Lang, Bradley, & Cuthbert, 2008). A dimensional conceptualization of emotion was used for the development of this pictorial system. The pictures included in IAPS variate depending on normative ratings of elicited emotions based on three dimensions: affective valence (ranging from pleasant to unpleasant), arousal (ranging from calm to excited), and dominance (Lang, Bradley, & Cuthbert, 2008). For this study, instead of categorizing pictures in low and high intensity groups, we selected 80 pictures with ratings in the full range of the arousal dimension (mean = 5.53, SD = 1.03, range = 3.46-7.35) and differing levels of negative valence (mean = 2.73, SD = 0.66, range = 1.51-3.92). This way, we were able to assess emotional intensity dimensionally in the main analyses maximizing the statistical information contained in this variable. Additionally, two picture contents from the IAPS were used, one evoking fear and one evoking sadness, as these contents are more relevant to individuals with a tendency to develop internalizing psychopathology.

Procedure

First, an Institutional Review Board (IRB) approval was acquired before data collection. Before initiating the study procedures, participants were provided with a description of the purposes of the research, the expected duration of the participation, as well as a description of the procedures to be followed. Participants were then asked to provide a written consent for their

participation. The study was conducted in a research laboratory at Ball State University.

The procedures used to test the research hypotheses were similar to Sheppes et al. (2014). Participants were randomly assigned in two conditions – long-term goal and short-term goal condition – and in each condition they viewed pictures of differing levels of emotional intensity. In the short-term goal condition, participants were told to consider for each picture both strategies (distraction and reappraisal) and select the one that is expected to make them feel less negative. In the long-term goal condition, participants were informed that they would encounter all pictures more than one time in the study. Participants clicked on an icon labeled with their preferred strategy to make their selection. Participants were randomly assigned to complete either the experimental task or the self-report measure first to avoid order effects.

Regarding the experimental procedure, first, a four-trial training phase was conducted, during which participants viewed emotionally charged pictures and were given instructions on how to use distraction or reappraisal. The instructions were the same used in Sheppes' et al. (2014) study. Specifically, regarding distraction, participants were asked to reduce their initial emotionally negative response toward a picture by attempting to think something unrelated to the picture. In the case of reappraisal, participants were asked to reduce their negative emotional experience toward the picture by changing its meaning. Specific examples were presented to ensure complete comprehension of the task. An extended description of the instructions can be found in Appendix A.

In the second phase, participants had eight practice trials. In the first four trials, they practiced both strategies and in the second four, they were given the opportunity to freely choose among strategies. During the trials, participants were told to talk out loud when implementing the strategies, in order to ensure adherence with the instructions. In the main phase of the

experiment, participants were presented with each picture for 500 ms. After the initial presentation of each picture participants were given the choice to select the strategy they preferred, distraction or reappraisal. After the selection, they implemented the strategy viewing the picture for 5000 ms.

After the completion of the experimental procedure, the participants were given the self-report measures of internalizing difficulties. After the completion of instruments, any questions or concerns were properly addressed.

Statistical Analysis

Descriptive statistics of the measured variables were first obtained, including means and standard deviations for the quantitative variables and frequencies/ percentages for the categorical variables. Then, bivariate analyses were performed by calculating correlations between the quantitative variables of the study using Spearman's *rho*. The Spearman's *rho* coefficient was preferred compared to the parametric Pearson's *r* (Pearson, 1896), because the assumption of normality was violated in the distributions of several variables included in the study. The univariate normality assumption was assessed through the evaluation of skewness and kurtosis (see *Table 1*), and graphically through Q-Q plots.

Confirmatory Factor Analysis (CFA) was conducted to model the fear and distress liabilities. Factor scores of the two liabilities were obtained and later used in the main analyses. The estimator used was the Robust Maximum Likelihood (MLR) estimator (Muthén & Muthén, 2010). This estimator was preferred to the regular Maximum Likelihood estimator because of evidence of violations of univariate normality of some of the scales used as indicators. A two-factor model was initially considered with the distress and fear liabilities as latent factors with the observed indicators: BDI-II, BAI, RCd, BHS, and DS for the distress liability, and NA of

PANAS-X, RC7, FQ, and NA of ATQ for the fear liability. A model fit to the data via CFA has to have a good fit. The fit of the CFA model is assessed through fit indices. In the absence of good fit, model respecification can be conducted (Brown, 2014). In this study, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker–Lewis fit Index (TLI), and Standardized Root Mean Square Residual (SRMR) were examined to evaluate the fit of each of the proposed models. Good fit of the model was defined as a value of TLI and CFI indices > 0.95 and a value of RMSEA < 0.06 (Hu & Bentler, 1999).

Given the suboptimal fit indices of the original model, an alternate model was also assessed focusing on the fear piece of negative affectivity in the fear liability. Specifically, the measures used as indicators of the distress liability were RCd, BHS, DS, BDI-II and BAI, and the measures used as indicators of the fear liability were the fear subscale of ATQ, FQ, and FRS. One-factor models were also evaluated constraining all scale indicators to load on one factor, the internalizing liability. Akaike Information Criterion (AIC; Akaike, 1974) was used to compare the different fitted models. AIC is a measure of the relative quality of a given model. Lower values of AIC indicate better fit of the model.

The study hypotheses were tested by fitting logistic regression models, using the Generalized Estimating Equations (GEE) method for parameter estimation (Liang & Zeger, 1986). This method enables the modeling of categorical outcomes, while taking into account the potential association of the repeated observations within a given participant. In this study each participant chose an emotion regulation strategy in response to emotion-provoking pictures, 80 different times. Therefore, the strategy selection observations were expected to be correlated within each participant.

The two general study hypotheses, that is, maladaptive evaluation of regulatory strategies

in fear and distress liabilities, were tested by evaluating the moderation effects of distress and fear liabilities on the effect of emotional intensity and goal proximity on strategy selection (binary dependent variable: distraction vs. reappraisal). Two models were fit to the data. In the first model, the moderating effects of the two liabilities on the relationship between emotional intensity and strategy selection were tested. In the second model, the moderating effects of the two liabilities on the relationship between goal proximity and strategy selection were tested. In the emotional intensity analysis, the goal proximity variable was included in the model to control for its potential effects on strategy selection. Similarly, in the goal proximity analysis, the emotional intensity variable was included in the model. All continuous predictors were mean centered to avoid multicollinearity. Post hoc analyses were conducted to evaluate differences in the assessed relationship across different picture contents (i.e., fear vs. sad content). More specifically, two separate analyses were conducted containing either responses to only fear-provoking pictures or only sadness-provoking pictures.

Results

Descriptive Statistics

Descriptive statistics of the distress (DISTRESS) and fear (FEAR) liability scores obtained by modeling Internalizing liability, as well as other measures included in the study are shown in *Table 1*. In this table, means and standard deviations of the study variables are presented.

Bivariate Correlations

Bivariate correlations between continuous variables were computed using Spearman's *rho*. The results are presented in *Table 2*. All correlations were statistically significant. The calculated correlation between variables varied from weak (e.g., $rho = 0.19$ between FRS and

DS) to strong (e.g., $\rho = 0.85$ between BDI and DS) in size. These results provided some initial evidence for a common vulnerability that would give rise to the observed associations between variables.

Confirmatory Factor Analysis (CFA) and Factor Scores Acquisition

Subsequently, the hypothesized two-factor model of distress and fear liabilities that give rise to the observed temperamental and symptom measure scores was fit to the data. Fit indices for all tested models are presented in Table 3. As shown in Table 3, the initial model did not fit the data well (RMSEA = 0.146 [90% CI = 0.116-0.176], CFI = 0.908, TLI = 0.873, SRMR = 0.049). A potential reason for this suboptimal fit was the very high correlation of distress and fear factors ($b = 0.977, p < 0.001$). Given this finding, a revised two-factor model was considered excluding measures of general negative affectivity, which likely inflated the association observed between the distress and fear factors. This is justifiable because negative affectivity is shared between distress and fear liabilities, although more characteristic of fear (Sellbom et al., 2008). The revised model better fit the data (RMSEA = 0.072 [90% CI = 0.017-0.114], CFI = 0.978, TLI = 0.967, SRMR = 0.034). One-factor models were also considered as baseline models to check whether they had a better fit compared to the examined two-factor models. The revised two-factor model had the lowest AIC and for this reason it was the one used in further analyses. The Bartlett's approach was used to extract the distress and fear factor scores. This procedure is a refined method of factor score extraction and is found to produce unbiased estimates of the true factor scores (Hershberger, 2005). The revised model is depicted in *Figure 1*, along with the item loadings and error variances.

Fear and Distress Moderation Models

For the main analyses, two logistic regression models, estimated using GEE, were fit to

the data. In the first model (*Table 4*), the moderating effects of DISTRESS and FEAR on the relationship between emotional intensity and strategy selection were tested. Smaller effects of emotional intensity on strategy selection as levels of the two liabilities increased were hypothesized. Results indicated that the moderation effect of FEAR on the relationship between emotional intensity and strategy selection was statistically significant (p -value <0.001). In contrast to the initial hypothesis, as shown in *Figure 2*, as FEAR increased, the effect of emotional intensity on odds of distraction came more pronounced. In other words, higher levels of FEAR (shown as +1 SD in *Figure 2*) were associated with a higher likelihood of choosing distraction in response to emotionally intense stimuli compared to lower levels of FEAR (shown as -1 SD in *Figure 2*). The significance of the effect of emotional intensity on strategy selection in mean, -1 SD, and +1 SD levels of FEAR assessed with Wald tests. The results from these tests showed that the effect was significant across all levels of FEAR (all p -values <0.001). Results also indicated that the moderating effect of DISTRESS on the effect of emotional intensity on strategy selection was not statistically significant (p -value = 0.351). However, the effect of DISTRESS on the odds of choosing distraction was significant ($OR = 0.89$, p -value <0.001). More specifically, as DISTRESS increased the selection of distraction became less likely and the selection of reappraisal became more likely.

In the second model (*Table 5*), the moderating effects of DISTRESS and FEAR on the relationship between goal proximity and strategy selection were tested. Smaller effects of goal proximity on strategy selection as levels of the two liabilities increased were hypothesized. Neither DISTRESS (p -value = 0.204) nor FEAR (p -value = 0.678) moderated the relationship between goal proximity and strategy selection. However, the main effects of DISTRESS ($OR = 0.92$, p -value = 0.024) and FEAR ($OR = 1.26$, p -value <0.001) were statistically significant

(*Figure 3*). More specifically, higher levels of DISTRESS were associated with an increased chance of selecting reappraisal, although the effect was small (i.e., for one unit increase of DISTRESS, the likelihood of choosing to reappraise increased by 8%). On the other hand, higher levels of FEAR were associated with increased chance of choosing to distract. This effect was larger, as for one unit increase on FEAR the likelihood of choosing to distract increased by 26%. Additionally, goal proximity was associated with strategy selection. In fact, participants in the long-term condition were 17% less likely to choose distraction over reappraisal than in the short-term condition ($OR = 0.83$, p -value <0.001).

Post-hoc Analyses

To assess whether the picture content affected the findings of the main analyses, separate post hoc analyses were conducted including responses to either only fear- or only sadness-provoking pictures. The first set of subgroup analyses evaluated the moderating effect of DISTRESS and FEAR on the relationship between emotional intensity and strategy selection separately in different picture contents (*Table 6*). FEAR significantly moderated the effect of emotional intensity on odds of distraction in both subgroup analyses. However, the moderation effect was larger when only fear-provoking pictures were included in the analysis (fear content: p -value <0.001 ; sadness content: p -value <0.001). The moderation effect of distress was nonsignificant in both subgroup analyses.

The second set of subgroup analyses evaluated the moderating effect of DISTRESS and FEAR on goal proximity and strategy selection separately in different picture contents (*Table 7*). Moderating effects were nonsignificant in both FEAR (fear content: p -value = 0.384; sadness content: p -value = 0.827) and DISTRESS (fear content: p -value = 0.075; sadness content: p -value = 0.875).

Discussion

The goal of this study was to examine a mechanism through which fear and distress liabilities are linked to deficits in the emotion regulation process. More specifically, this study addressed four research questions. The first question was whether the evaluation process of emotion regulation strategy selection differs across different levels of stimuli emotional intensity as a function of the fear liability. That is, does a tendency toward fearfulness affect the relationship between emotional intensity of emotion provoking pictures and the selection of early versus late disengagement emotion regulation strategies? The second question was whether the evaluation process of strategy selection differs across different levels of emotional intensity as a function of the distress liability. That is, does a tendency toward experiencing distress affect the relationship between emotional intensity and the selection of early versus late disengagement emotion regulation strategies? The third question was whether the evaluation process of strategy selection differs across different goal proximity conditions as a function of the fear liability. That is, does fear proneness affect the relationship between goal proximity (long- versus short-term goals) and the selection of emotion regulation strategies? The fourth question was whether the evaluation process of strategy selection differs across different goal proximity conditions as a function of the distress liability. That is, does the distress liability affect the relationship between goal proximity (long- versus short-term goals) and the selection of early versus late disengagement emotion regulation strategies? The research hypotheses were assessed by testing the moderating effects of the distress and fear liabilities on the relationship between: 1) emotional intensity and strategy selection, and 2) goal proximity and strategy selection.

The first research hypothesis was partially supported by the data. Specifically, the fear liability significantly moderated the effect of emotional intensity on the odds of choosing to

distract. Indeed, increased standing on the fear liability was associated with an increased preference for early disengagement distraction. However, the moderating effect had the opposite direction to that hypothesized. Additionally, post hoc analysis revealed a larger moderation effect among fear- provoking picture content compared to sadness-provoking content. The second hypothesis of a moderating effect of the distress liability in the relationship between emotional intensity and strategy selection was not supported by the data. However, higher standing on the distress liability was associated with a stronger tendency to use late disengagement reappraisal in general. Post hoc subgroup analyses on different picture contents (i.e., fear- and sad-related content) did not show a significant moderation effect in either of picture contents. The third and fourth research hypotheses were not supported, since the moderation effects of the fear and distress liabilities on the relationship between goal proximity and strategy selection were not statistically significant in either the main or the content subgroup analyses. However, significant main effects were found between the liabilities and strategy selection. The odds of distraction increased as standing on the fear liability increased, while the odds of reappraisal increased as standing on the distress liability increased. Additionally, the effect of goal proximity on strategy selection was significant. People were more likely to choose reappraisal, if the goal was long term.

According to the research findings, the fear liability was a significant moderator in the relationship between emotional intensity and strategy selection. As hypothesized, individuals with higher levels of fear liability were, on average, more likely to choose early disengagement distraction over late disengagement reappraisal. This finding is in line with previous research suggesting a tendency of individuals with fear disorders to disengage from fear-provoking emotional information (Cisler & Koster, 2010; Garner et al., 2006; Mogg et al., 2004;

Pflugshaupt et al., 2005). This tendency has been linked to attentional biases toward threat which affect emotion regulation goals and elicit attentional avoidance (Cisler & Koster, 2010).

However, in contrast to the initial hypothesis, the effect of emotional intensity on the odds of choosing distraction became larger as the fear liability increased, instead of smaller as hypothesized. In other words, the odds of selecting distraction were not elevated across all levels of the fear liability as expected, but increased from low to high odds, and even more steeply compared to lower levels of the liability. Therefore, the fear liability had a synergistic effect on the relationship between emotional intensity and distraction selection, intensifying this association. This suggests that individuals with a higher tendency toward fearfulness are able to recognize that different types of strategies have differential costs and benefits depending on the levels of emotional intensity. However, it seems that emotional intensity makes the selection of distraction even more likely at higher levels compared to lower levels of the fear liability. This finding was further probed with subgroup analyses across different picture contents. This set of analyses identified a larger moderation effect of fear in the relationship between emotional intensity and odds of choosing distraction, when only fear-provoking pictures were included in the analysis. This result is in line with findings showing selective attention of individuals with fear-related disorders toward concern-relevant external stimuli (or fear-provoking stimuli; Harvey et al., 2004), which might trigger increased use of distraction to protect themselves from them. However, it is worth mentioning that when only sad-provoking pictures were included in the analysis, the selection of distraction was still more frequent across high levels of fear proneness as emotional intensity increased. This finding points to a general tendency of individuals with fear liability to select distraction in response to negative emotional stimuli (although this choice is more pronounced in response to fear-relevant stimuli).

The second study hypothesis was not supported by the data. That is, distress liability did not have a moderating effect on the relationship between emotional intensity and strategy selection as hypothesized. Although the moderation effect was not supported, the main effect of the distress liability on the odds of choosing late disengagement reappraisal was significant. This suggests that individuals with distress proneness might not have a difficulty in understanding that the two types of strategies are differentially beneficial across different levels of emotional intensity. However, they do have a tendency to consider reappraisal as more beneficial than distraction compared to individuals with lower levels of distress proneness. The results showed that as proneness to distress increased the odds of reappraisal selection increased as well (although the effect was small). This is in line with literature suggesting that individuals with distress-related disorders, such as depression or generalized anxiety, are more likely to choose to excessively engage with emotion (Sheppes et al., 2014). However, the specific engagement strategy that was used in this study has generally been considered as an adaptive strategy that individuals with distress-related disorders tend not to use (Aldao, Nolen-Hoeksema, & Schweizer, 2010). The logic behind the initial hypothesis (which was supported by the results of the study) that individuals with high distress proneness would be more likely to choose reappraisal was based on several interesting past research findings. Specifically, it has been suggested that reappraisal shares a cognitive mechanism and neural basis with rumination, as well as a tendency to attend to the emotional information elicited by a situation and the active processing of its negative meaning (Cohen et al., 2014; Ray et al., 2005). However, the successful execution of reappraisal depends on intact executive functioning (Raio et al., 2013). A potential explanation of why individuals with distress-related disorders do not end up using this strategy is that its implementation might fail due to an entrapment in a cycle of rumination. This

could be due to impaired response inhibition, an executive function facet (Papageorgiou & Wells, 2003; Simpson & Papageorgiou, 2003). This impairment could be caused by increased levels of distress, which make the effective application of the strategy less likely (Raio et al., 2013). This would be an interesting route for future research.

The finding that long-term goals were associated with higher chance of choosing reappraisal was in accordance with past literature. Reappraisal enables engagement with emotional information, which makes it highly effective in regulating emotion when long-term relief is sought (Sheppes et al. 2011, 2014). Distraction, on the other hand, is less adaptive for long term goals, because it does not allow engagement and dealing with the emotional information at hand (Sheppes et al. 2011, 2014). Therefore, an adaptive emotion regulation choice profile involves choosing reappraisal when the goal is long-term. This hypothesis was supported by the data, since the choice of reappraisal was significantly more frequent in the long-term condition. However, the last two research hypotheses stating that the distress and fear liabilities would be related to a suboptimal cost-benefits analysis with a result the lack of differentiation between strategies in the goal proximity conditions was not supported by the data. This nonsignificant result could be attributed to aspects of how we tested this question. Namely, low statistical power could lead to inability to detect an existing effect. Also, the levels of internalizing liability were relatively low, because the sample consisted of students and did not come from a clinical population. As a result, there was a restricted range of liability values in the sample which might have resulted in attenuated estimated effects. However, it may be that individuals with high distress and fear liabilities do not have difficulties differentiating between the costs and benefits of strategies in short versus long-term goals. This would mean that individuals with high standing in the internalizing liability are able to take into account how

proximal or distal their emotion regulation goal is, when making decisions among regulatory strategies. If this hypothesis is true, it would mean that other steps in the emotion regulation process are responsible for the poor emotion regulation often observed in individuals with a tendency toward internalizing difficulties (Aldao et al., 2013). For example, it could be that individuals prone to fear or distress have difficulties implementing the selected regulatory tactic or have deficits in monitoring the effectiveness of their selected strategy across time, and modify it as necessary (Sheppes et al., 2015). One reason for this could be low emotion regulation-related self-efficacy. That is, individuals with high levels of internalizing might not be as confident in their abilities to successfully use a certain strategy that they consider adaptive, resulting in a premature stopping of an activated emotion regulation response (Sheppes et al., 2015).

This study has several limitations that are worth noting. This study considered emotional intensity and goal proximity as two contextual factors that influence the assignment of specific weights when evaluating available regulatory strategies. Although people with high fear and distress liabilities might not have difficulties in identifying costs and benefits of emotion regulation strategies based on these contextual factors, they might have difficulties to take into account other factors in their emotion regulation decision-making process. Some of those factors identified as central when making a decision as to what strategy would be more beneficial in regulating emotion are cognitive and physiological resources (Baumeister, 2003; Beedie & Lane, 2012; Urry & Gross, 2010) and the beliefs that someone has about their ability to effectively use a given emotion regulation strategy (low emotion regulation-related self-efficacy; Sheppes et al., 2015). The study of the evaluation of these factors might lead to different conclusions about the ability of individuals with high distress and fear proneness to differentiate among strategies.

Similarly, a different set of emotion regulation strategies might also lead to different results. Although individuals high in the distress and fear liabilities might be able to adequately discern the costs and benefits of distraction relative to reappraisal, they might have difficulties with other disengagement versus engagement strategies. Further examination of additional contextual factors, in combination with different strategies would be an interesting route for future research. This would help us develop a more comprehensive picture about the difficulties that individuals prone to experience fear and distress have in their emotion regulation decision-making. This investigation would also help clinicians to identify where problems in the regulation of emotion lie for these individuals, with a resulting ability to create and apply more suitable treatment plans.

Moreover, due to time and resources constraints, this study focused on a specific element of the selection stage of the emotion regulation process. Emotion regulation is a complex, dynamic process encompassing a number of valuation systems that iterate across time (Gross, 2015, Sheppes et al., 2015). It involves decisions on what emotions individuals choose to regulate, with what available strategies and specific tactics, and how they implement these tactics. To create a more accurate picture of how individuals high in distress and fear vulnerability make these decisions, a study design that enables researchers to capture the dynamic aspects of this phenomenon and how it changes over time would be appropriate. Such a design would enable the isolation of difficulties specific to a given stage controlling for difficulties carried through from earlier stages of the emotion regulation process. For example, the finding that individuals high in fear liability are more likely to choose distraction over reappraisal when emotional intensity is high might be a product of dysfunctions in the emotion generation process or the identification stage of emotion regulation and not a dysfunction in later

stages of the process. A research design that incorporates all of these stages measured sequentially could help resolving such ambiguities.

Finally, some methodological limitations should be mentioned. First, the study sample was relatively small. This might account for the lack of significant moderating effects in the goal proximity analysis. Also, due to this limitation, we were not able to fit structural equation models to evaluate the moderating role of the internalizing liabilities in the relationship of emotional intensity and goal proximity with strategy selection. Instead, we had to run logistic regressions using factor scores to represent the liabilities. Obtainment and use of factor scores in further analyses has raised objections in the literature (DiStefano, Zhu, & Mindrila, 2009). Therefore, in the future, the results of this study should be replicated using a more refined, latent variable modeling approach.

In conclusion, this study had two general objectives. Driven by criticisms of the predominant nosological system (Krueger & Markon, 2006a), the first objective was to direct emotion regulation and psychopathology research away from specific, DSM-defined, mental disorders. This was achieved by conceptualizing and operationalizing internalizing psychopathology as variations in a spectrum. The second objective was driven by a movement in the field of emotion regulation to incorporate other emotion regulation processes, beyond strategy use, in its definition (Sheppes, Suri, & Gross, 2015). This enables the consideration of difficulties in stages that precede strategy implementation and, thus, potentially mediate the relationship between emotion generation and successful regulation of emotion. Therefore, this study aimed to identify deficits in the valuation element of the selection stage that individuals within the fear and within the distress spectrum share. Although no evidence was provided indicating an inability of people standing high on the internalizing liabilities to recognize that the

two types of strategies are differentially beneficial as a function of contextual factors, there was evidence for differential consideration of emotional intensity across levels of the fear liability. Additionally, a differential selection of the two strategies was shown depending on the type of liability. Specifically, the results of the study pointed to a tendency for over-selection of the early disengagement distraction in high levels of fear proneness and an over-selection of the late disengagement reappraisal in high levels of distress proneness. These results expanded our understanding of emotion regulation decision making in the internalizing psychopathology by identifying common tendencies of individuals who share dispositions toward fear and distress proneness. This provides some initial evidence that challenges in emotion regulation are not disorder-specific, but common among shared higher-order liabilities underlying internalizing psychopathology. This is important from a clinical perspective, because given that transdiagnostic treatments are more and more frequently applied in clinical settings, it gives clinicians direction as to what specific strategy to target in treatment that would alleviate difficulties related to multiple disorders in the internalizing spectrum.

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Table 1

Descriptive measures

	Mean (SD)	Mean (SD)	Mean (SD)	<i>p</i> -value	Alpha	Skewness/ Kurtosis
	<u>Total</u>	<u>Female</u>	<u>Male</u>			
DISTRESS	0.00 (1.03)	0.09 (1.03)	-0.34 (0.90)	0.030	-	0.28/ 1.97
FEAR	0.00 (1.17)	0.21 (1.10)	-0.59 (1.17)	0.001	-	0.02/ 2.98
BHS	5.76 (4.61)	6.07 (4.60)	4.44 (4.17)	0.070	0.87	0.84/ 2.62
DS	12.17 (7.41)	12.84 (7.51)	9.43 (6.33)	0.020	0.94	0.12/ 1.93
MMPI-2						
RCd	11.42 (7.41)	11.50 (7.14)	10.60 (7.87)	0.600	0.93	0.03/ 1.67
RC7	11.5 (5.65)	11.90 (5.33)	10.00 (6.19)	0.100	0.87	-0.14/ 1.98
FRS	6.09 (3.38)	6.90 (3.34)	4.03 (2.56)	<0.001	0.68	0.15/ 1.92
BDI	17.03 (10.71)	17.40 (10.30)	14.40 (10.30)	0.200	0.93	0.65/ 2.73
BAI	13.62 (9.91)	14.70 (10.30)	10.00 (8.14)	0.020	0.91	0.90/ 3.28
FQ	37.52 (17.94)	40.30 (17.50)	29.30 (16.50)	0.002	0.82	0.39/ 2.99
ATQ						
Fear	4.09 (1)	4.22 (0.96)	3.71 (1.03)	0.020	0.68	-0.08/ 3.03
NA	4.19 (0.79)	4.31 (0.72)	3.82 (0.88)	0.006	0.83	-0.42/ 4.19
PANAS						
NA	22.37 (7.51)	22.80 (7.57)	20.60 (6.81)	0.100	0.89	0.46/ 2.68

Notes. BHS = Beck's Hopelessness Scale; DS = Demoralization Scale; RCd = Demoralization scale; RC7 = Dysfunctional Negative Emotions scale; FRS = Fears scale; BDI = Beck's Depression Inventory; BAI = Beck's Anxiety Inventory; FQ = Fear Questionnaire; NA = negative affect.

Table 2

Correlation matrix using Spearman *rho*.

	DISTRESS	FEAR	BHS	DS	RCd	BDI	BAI	FATQ	FQ	RC7	FRS	Age
DISTRESS	1											
FEAR	0.55***	1										
BHS	0.82***	0.45***	1									
DS	0.97***	0.53***	0.74***	1								
RCd	0.89***	0.5***	0.74***	0.83***	1							
BDI	0.92***	0.5***	0.75***	0.85***	0.75***	1						
BAI	0.81***	0.51***	0.62***	0.75***	0.65***	0.76***	1					
FATQ	0.53***	0.9***	0.38***	0.53***	0.5***	0.45***	0.47***	1				
FQ	0.39***	0.68***	0.4***	0.36***	0.31***	0.37***	0.32***	0.4***	1			
RC7	0.76***	0.52***	0.6***	0.72***	0.8***	0.63***	0.61***	0.46***	0.28**	1		
FRS	0.28**	0.65***	0.28**	0.25**	0.22*	0.28**	0.3**	0.37***	0.36***	0.39***	1	
Age	-0.17	-0.15	-0.07	-0.18	-0.17	-0.11	-0.11	-0.13	-0.16	-0.14	-0.02	1

Notes. BHS = Beck's Hopelessness Scale; DS = Demoralization Scale; RCd = Demoralization scale; RC7 = Dysfunctional Negative Emotions scale; FRS = Fears scale; BDI = Beck's Depression Inventory; BAI = Beck's Anxiety Inventory; FQ = Fear Questionnaire; PNA = PANAS-X Negative Affect scale. * p -value<0.05, ** p -value<0.01, p -value<0.001.

Table 3

Fit Indices of the four tested Internalizing models.

Model	χ^2	<i>df</i>	<i>p</i> -value	CFI	TLI	SRMR	RMSEA	AIC
1-Factor Model (Initial)	760.95	36	<0.001	0.908	0.877	0.050	0.149	6333.76
1-Factor Model (Revised)	538.610	28	<0.001	0.939	0.914	0.065	0.116	5631.217
2-Factor Model (Initial)	760.95	36	<0.001	0.908	0.873	0.049	0.146	6334.66
2-Factor Model (Revised)	538.610	28	<0.001	0.978	0.967	0.034	0.072	5610.765

Note: **1-Factor Model (Initial)**: Demoralization, negative affect, and distress and fear symptomatology scales loaded onto one Internalizing factor; **1-Factor Model (Revised)**: Demoralization, fearfulness tendency, and distress and fear symptomatology scales loaded onto one Internalizing factor; **2-Factor Model (Initial)**: Model with two correlated factors – demoralization and distress symptomatology scales loaded onto the distress factor, and negative affect and fear symptomatology scales loaded onto the fear factor; **2-Factor Model (Revised)**: Model with two correlated factors – demoralization and distress symptomatology scales loaded onto the distress factor, and fearfulness tendency and fear symptomatology scales loaded onto a fear factor.

Table 4

GEE logistic regression model for strategy selection – interactions with emotional intensity.

	<i>OR</i>	95% CI	<i>p-value</i>
FEAR	1.23	1.17 - 1.30	< 0.001
DISTRESS	0.89	0.85 - 0.94	< 0.001
Intensity	1.8	1.74 - 1.90	< 0.001
Long term	0.83*	0.76 - 0.91	< 0.001
FEAR x Intensity	1.14	1.08 - 1.19	< 0.001
DISTRESS x Intensity	0.97	0.92 - 1.03	0.351

Note: *OR* = Odds Ratio; *OR* > 1: higher odds of choosing distraction; *OR* < 1: higher odds of choosing reappraisal; Intensity: Picture Emotional Intensity

* *OR* based on the long-term condition category of the strategy selection variable.

Table 5

GEE logistic regression model for odds of strategy selection – interactions with goal proximity.

	<i>OR</i>	95% CI	<i>p-value</i>
FEAR	1.26	1.17 - 1.35	<0.001
DISTRESS	0.92	0.86 - 0.99	0.024
Long term	0.83*	0.76 - 0.91	<0.001
Intensity	1.8	1.73 - 1.89	<0.001
FEAR x Long term	0.98	0.89 - 1.08	0.678
DISTRESS x Long term	0.93	0.84 - 1.04	0.204

Note. *OR* = Odds Ratio; *OR* > 1: higher odds of choosing distraction; *OR* < 1: higher odds of choosing reappraisal; Intensity: picture emotional intensity; *SE* = standard error.

* *OR* based on the long-term condition category of the strategy selection variable.

Table 6

GEE logistic regression model for odds of strategy selection in different emotional contents –interactions with emotional intensity.

	<i>OR</i>	95% CI	<i>p-value</i>		<i>OR</i>	95% CI	<i>p-value</i>
FEAR	1.16	1.08 - 1.24	<0.001		1.31	1.21 - 1.42	<0.001
DISTRESS	0.99	0.92 - 1.06	0.778		0.8	0.73 - 0.88	<0.001
Intensity	2.01	1.89 - 2.13	<0.001		1.74	1.61 - 1.88	<0.001
Long Term	0.85*	0.76 - 0.96	0.009		0.80*	0.70 - 0.92	0.002
FEAR x Intensity	1.07	1.01 - 1.15	0.031		1.18	1.08 - 1.29	<0.001
DISTRESS x Intensity	1.05	0.98 - 1.13	0.144		0.94	0.86 - 1.03	0.20

Note. *OR* = Odds Ratio; *OR* > 1: higher odds of choosing distraction; *OR* < 1: higher odds of choosing reappraisal; Intensity: picture emotional intensity; *SE* = standard error

* *OR* based on the long-term condition category of the strategy selection variable.

Table 7

GEE logistic regression model for odds of strategy selection in different emotional contents – interactions with goal proximity.

	<i>OR</i>	95% CI	<i>p-value</i>	<i>OR</i>	95% CI	<i>p-value</i>
FEAR	1.13	1.03 - 1.24	0.009	1.46	1.31 - 1.62	<0.001
DISTRESS	0.98	0.90 - 1.08	0.733	0.84	0.75 - 0.94	0.002
Long Term	0.85*	0.76 - 0.96	0.009	0.80*	0.70 - 0.92	0.002
Intensity	2	1.89 - 2.12	<0.001	1.74	1.61 - 1.88	<0.001
FEAR x Long term	1.01	0.89 - 1.15	0.827	0.94	0.80 - 1.09	0.384
DISTRESS x Long term	0.99	0.86 - 1.14	0.875	0.86	0.73 - 1.02	0.075

Note. *OR* = Odds Ratio; *OR* > 1: higher odds of choosing distraction; *OR* < 1: higher odds of choosing reappraisal; Intensity: picture emotional intensity; *SE* = standard error

* *OR* based on the long-term condition category of the strategy selection variable.

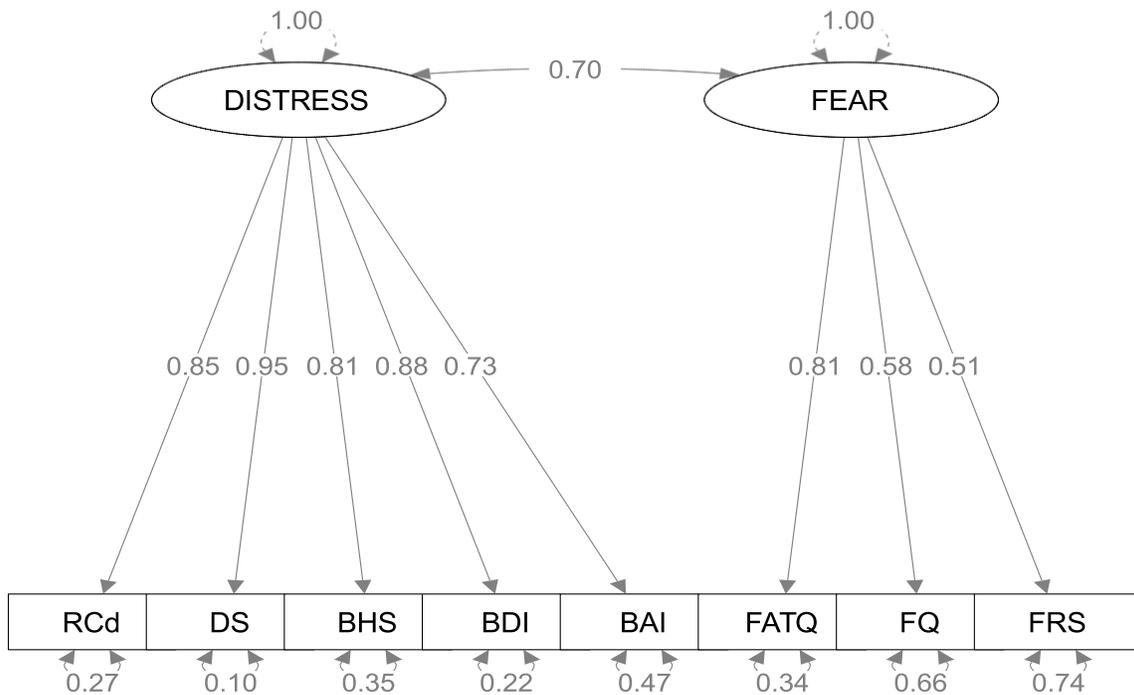


Figure 1. Confirmatory Factor Analysis for the 2-factor Internalizing model (Revised). RCd = Demoralization scale of MMPI-2-RF; DS = Demoralization Scale; BHS = Beck's Hopelessness Scale; FATQ = Fear scale of ATQ; FRS = Fears scale of MMPI-2-RF.

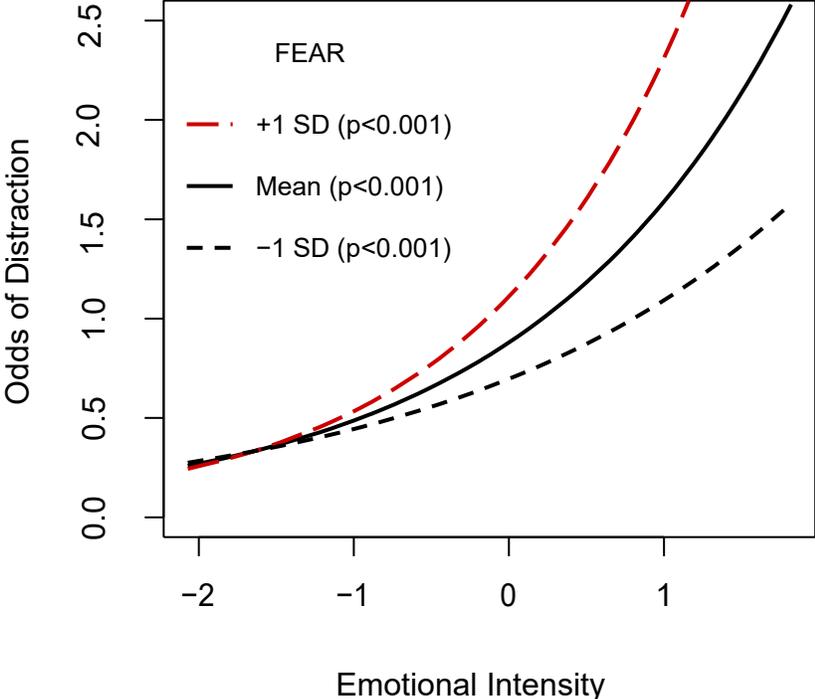


Figure 2. Effect of emotional intensity on strategy selection across levels of FEAR (overall p-value < 0.001)

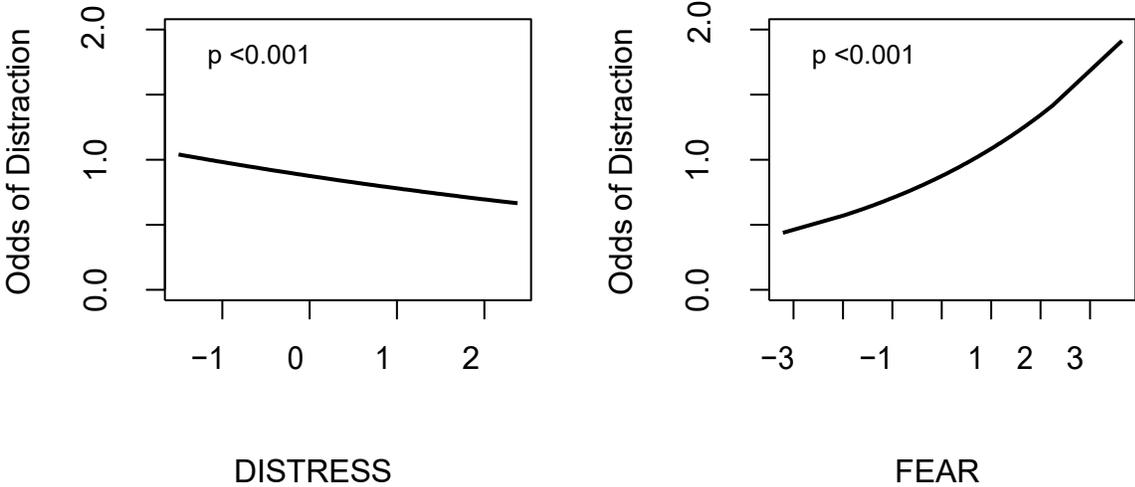


Figure 3. Effect of DISTRESS and FEAR on odds of distraction (p -values based on a model without interactions).

Appendix A

Distraction instructions:

“Try your best to feel less negative about the picture by thinking of something that is completely unrelated to the picture. There are a few ways you can do this. First, you could imagine your neighborhood or other familiar streets. For instance, if you see a negative picture of a woman who has been burnt, you could think of biking around campus and the different buildings around you. Second, you could imagine yourself doing everyday tasks, such as taking a shower or making coffee in the morning. You could use any one of these ways to distract yourself that you think will work best in making you feel less negative, and you don’t have to use the same way to distract all the time. However, it is important that you keep your eyes on the picture and not avert your gaze. Also, when distracting, it’s important that you not focus on something that is highly emotional, so we don’t want you to think about anything that brings you sadness or extreme happiness.”

Reappraisal instructions:

“Try your best to feel less negative about the picture by attending to the picture and trying to change the meaning of it. That means you think of something to tell yourself about the picture that helps you feel less negative about it. So, for example, you could tell yourself something about the outcome, so that whatever is going on will soon be resolved or that help is on the way. You could also focus on a detail of the situation that may not be as bad as it first seemed. But we want you to stay focused on the picture and not think of random things that make you feel better, but rather to change something about the picture that helps you to feel less negative about it. Once again, keep focusing on the picture but tell yourself something about the picture that makes you feel less negative about the picture.”