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Advancing Emotion Regulation Perspectives on Psychopathology: The Challenge of Distress Disorders

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The study of emotion regulation has impacted numerous subfields of psychology including developmental, organizational, social, cognitive, neurobiological, and health investigations (see Gross, 2014). The subfield of clinical psychology was initially slower to utilize an emotion regulation perspective (Mennin, Heimberg, Turk, & Fresco, 2002) but has now substantially incorporated this perspective into theoretical, experimental, assessment, and intervention contexts (see Gross, 2014; Kring & Sloan, 2009). One clear benefit has been a greater integration of clinical psychology with the other subfields of psychology. Ten years ago, cognitive and biological models of psychopathological conditions appeared quite divergent. Today, for instance, it is quite common to see the neural functioning of disorders examined in relation to specific cognitive processes and corresponding tasks (e.g., Etkin, Prater, Hoeft, Menon, & Schatzberg, 2010). Further, in no small part due to the study of emotion regulation, the overall field of psychology is more integrated with clinical psychology contributing prominently to this fieldwide integration.

Gross (this issue) provides a compelling extension to his process model of emotion regulation (Gross, 1998), addressing findings in the extant empirical literature that both support and challenge prior emotion regulation perspectives (Webb, Miles, & Shereen, 2012). Particularly relevant to psychopathology, Gross stresses three considerations for understanding the process and implementation of emotion regulation. First, he emphasizes *function*, highlighting the importance of temporally related functional relationships within and between “valuation systems” that are enacted to discriminate whether something is “good for me” versus “bad for me.” Gross explains that emotion generation and regulation can be seen as operating as different valuation systems, where the former is enacted to mobilize us toward or away from beneficial or harmful external stimuli in the world or internal representations of stimuli in the world (i.e., “first-level valuation” system) and the latter is enacted to influence or correct the first valuation system at different points along the emotion generation trajectory, in order to be responsive to changing internal goals and external circumstances (i.e., “second-level valuation” system). Second, he emphasizes *structure* (also discussed in greater detail in Ochsner & Gross, 2014), demonstrating that valuations at each level can be enacted with less elaborative to more elaborative

representational complexity involving relatively less depleting perceptual processes that direct attention and more depleting verbally mediated cognitive processes that invoke appraisals (Badre & D'Esposito, 2007). At the neural level, increasing cognitive elaboration appears to be associated with medial prefrontal (PFC) recruitment that moves from ventral to dorsal regions with increasing representational complexity (Ochsner & Gross, 2014). Activation of representationally elaborative processes involves increased mental effort and, thus, can result in greater resource depletion given competition for these resources (Joormann, Nee, Berman, Jonides, & Gotlib, 2010; MacNamara & Hajcak, 2010; Muraven & Baumeister, 2000). Third, along with others (e.g., Aldao, 2013; Bonanno & Burton, 2013), Gross stresses the importance of *context* and corresponding emotion regulation flexibility such that the utility of an emotion regulation strategy may covary with the circumstances it is enacted within. For instance, given highly emotionally evocative contexts, optimal emotion regulation may most effectively involve engaging less elaborative capacities (e.g., attentional distraction) before more elaborative capacities (e.g., reappraisal; Sheppes & Gross, 2011).

One contributing factor to the relatively slower penetration of emotion regulation principles into the disciplines of clinical psychology and psychiatry has been the field's reliance on a nosological system that emphasizes observable behavioral characteristics (i.e., symptoms) instead of underlying biobehavioral markers of disorder (e.g., *Diagnostic and Statistical Manual of Mental Disorders* [5th ed.]; American Psychiatric Association, 2013). This approach facilitates diagnostic agreement among clinicians but may hamper the search for underlying biobehavioral signatures of these conditions (e.g., Gross & Jazaieri, 2014). In response to the emphasis of the *DSM* and its predecessors in favoring surface characteristics, the National Institute of Mental Health (NIMH) has proposed an alternate system of nosology called the "Research Domain Criteria initiative" (Cuthbert & Insel, 2010), which seeks to identify mechanisms that explain processes from normative to dysfunctional variants in hopes that new forms of intervention can be developed to normalize the underlying biobehavioral markers and ideally improve treatment efficacy for otherwise treatment refractory disorders. One set of particularly refractory conditions is the "distress disorders," which include generalized anxiety disorder (GAD), major depressive disorder (MDD), and posttraumatic stress disorder. These disorders, especially when they co-occur, often fail to make sufficient treatment gains, thereby prolonging their deficits in life functioning and satisfaction. For example, in a meta-analysis of cognitive behavioral therapy for GAD, Borkovec and Ruscio (2001) found that only 50% to 60% of treated individuals demonstrated clinically meaningful change. Further, although more efficacious, the difference between current psychological treatments for MDD and nondirective supportive therapy reflects only a small effect size (Cuijpers, van Straten, Andersson, & van Oppen, 2008). Also, among GAD individuals with comorbid MDD, gains in treating depression are not especially durable (Newman, Przeworski, Fisher, & Borkovec, 2010). Finally, in the recently concluded, NIMH-funded Sequenced Treatment Alternatives to Relieve Depression Study, the subgroup of individuals with mixed anxiety-depressive disorder (e.g., MDD C apprehensive anxious symptoms) was most treatment refractory (Farabaugh et al., 2010).

Consistent with the recent emphasis on "transdiagnostic processes" (i.e., phenotypic characteristics that underlie numerous, often co-occurring disorders; Nolen-Hoeksema &

Watkins, 2011), factor analytic evidence demonstrates that these disorders jointly reflect a higher order factor of “distress” that has been distinguished from a “fear” factor, which relates to disorders more characterized by acute arousal (e.g., Krueger & Markon, 2006; Watson, 2005). Although there remains some heterogeneity in definitions of distress and coping mechanisms involved in distress (i.e., distress tolerance; see Leyro, Zvolensky, & Bernstein, 2010), distress can be defined as an intensive and prolonged internal processing of perceived stressors or negative affect. Congruent with the Research Domain Criteria initiative, it will be important to uncover components of distress that are common to these refractory disorders as well as to understand their dimensional relationship to normative instantiations of distress. Identifying emotion generative and regulatory mechanisms may help explain refractory distress-related processing.

However, one of the biggest challenges to applying an emotion regulation perspective in complex psychopathology may be the difficulty of understanding generative and regulatory emotion processes in instances where these processes are fully enacted internally without immediately instigating extrinsic stimuli or direct external targets of regulation. For instance, worry and rumination are at the heart of distress disorders and can be instigated in response to perceived threats and losses without immediate external contingencies; they also do not produce immediate overt instrumental behavior that would help signal for these regulatory efforts to cease. Thus, it can be difficult to characterize, differentiate, and intervene upon internal processes related to emotion generation (i.e., first-level valuations) and emotion regulation (i.e., second-level valuations). Yet these types of internally mediated emotion generation and regulation processes are at the heart of distress and distress disorders but are not currently well addressed by emotion regulation investigations and may suggest an important direction for improving the explanatory power of emotion regulation for refractory psychopathology.

In the remainder of this commentary, we provide an emotion dysregulation perspective of distress and distress-related disorders (also see Mennin & Fresco, 2013, 2014) while highlighting functional, structural, and contextual considerations suggested by Gross (this issue) in his extended process model. Specifically, to understand internally mediated emotion generation and regulation factors related to distress and its disordered variants, we suggest it will be important to emphasize (a) motivational mechanisms at the first valuation level, (b) self-referential regulatory mechanisms at the second valuation level, and (c) contextual learning consequences of these mechanisms. With consideration of these factors and updates to emotion regulation conceptualizations, prototypical case illustrations of normative to disordered distress responses are presented. We then conclude with a discussion of treatment implications for complex and refractory psychopathological conditions.

Motivational Mechanisms at the First Valuation Level

Emotions are functional in that they are activated in service of mobilization or preparation to mobilize. However, this activation and resulting action tendency (Frijda, 1986) may be helpful or harmful as determined by a given context or corresponding goal (Gross, this issue). Gross argues that initial, reactive components of emotion (i.e., emotion generation)

can be seen as the purview of a first valuation level, which is tasked with responding to the world or representations of the world (Gross, this issue) with detections of departures to expected referents (i.e., expectations drawn from associational or rule/belief-based learning; Carver & Scheier, 1998). Gross explains that a valuation system disengages when the discrepancy between this referent and the status of the world or the invoking representation of the world is reduced through action or influence of regulatory processes (at the second valuation level; see the next section).

Gross argues that this generative valuation is one of a “good for me” versus “bad for me” discrimination—in essence, a hedonic assessment. However, as Gross acknowledges, emotions may be counterhedonic in that individuals may engage negative emotions or avoid positive emotions to serve instrumental goals (Parrott, 2002; Tamir, 2005, 2009). As Tamir (2005) explained, individuals may be motivated to achieve positive outcomes rather than positive feelings, and in this case, individuals may mobilize toward a positive outcome via a negative experience. For instance, law and medical students often report experiencing high levels of stress (and distress) in their training to receive the positive outcome of their advanced degrees. Rather than hedonics, individuals’ emotion generation valuations may best be understood by motivational characterizations (Harmon-Jones, Price, & Gable, 2012). Motivation has been defined as an internal process, intimately linked to emotion, that energizes behavior and gives it direction (e.g., Kleinginna & Kleinginna, 1981).

This directional focus provides motivational conceptualizations with greater specification of stereotyped mobilization targets enacted by a given emotion compared to hedonic conceptualizations. Specifically, motivation is typically defined in terms of an approach system that reflects sensitivities to appetitive stimuli and an avoidance system that is responsive to aversive stimuli (e.g., Dollard & Miller, 1950; Lang & Bradley, 2008). However, this directional terminology may also be lacking in relation to instances of internal emotion generation such as is common in distress. Drawing from overt behavioral research, approach and avoidance terminology implies unidimensional mobilization where an organism either advances or retracts in behavior (this is similarly problematic in approach–avoidance experimental manipulations such as those that employ push–pull lever paradigms; e.g., Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010). But given our human ability to represent action imaginatively, we can be influenced by both the impetus to protect ourselves from threat and the impetus to mobilize toward reward. Thus, we can be mutually influenced by the motivational salience of stimuli, perceived or real, that signal perceived threats/safety cues (i.e., security focus) in the face of gains/losses (i.e., reward focus; Carver & Scheier, 1998; Gray & McNaughton, 2000; Higgins, 1997; Lang & Bradley, 2008). In distress, a common experience can be that internally generated, emotional responses are mobilizing our attention to both threats and rewards (e.g., reflecting on a potential new career or relationship has potential risks and benefits that may simultaneously activate us).

Instead of these hedonic or behavioral designations, we suggest the terminology of “reward system” and “security system” (see Carver & Scheier, 1998; Higgins, 1997; Lang & Bradley, 2008, for similar terminological alternatives to approach–avoidance designations), which specify potential motivators regardless of behavioral output. A reward system mobilizes attention and potential action toward rewarding or appetitive stimuli or to minimize loss of

such stimuli. Reward can be further specified in relation to consummatory pleasure (i.e., “liking,” the hedonic impact that a reward produces) and anticipatory pleasure (i.e., “wanting,” the incentive salience associated with a particular reward; Berridge, Robinson, & Aldridge, 2009). By contrast, a security system motivates engagement of safety seeking to produce quiescence and calm and avoid perceived threatening or painful stimuli or end states. One of our most basic, primary directives is to bring balance with respect to engaging reward and minimizing loss while seeking safety and avoiding threat (Dollard & Miller, 1950). As we increasingly become creatures of habit over the course of our lives, we are continually pushed and pulled by motivations to maintain security and gain reward.

Variation in activation of reward and security systems may be determined by both situational and individual characteristics. “Strong situations” (Lissek, Pine, & Grillon, 2006) may produce intense emotional responses in many individuals. Examples include traumatic responding and receiving a diagnosis of cancer (indeed cancer-diagnosis-related distress has been talked about as “the sixth vital sign”; Bultz & Johansen, 2011). However, evidence suggests that individual differences are a vital determinant of responsiveness to motivational cues, beyond the presence of external stressors (e.g., Vinkers et al., 2014). A characteristic tendency for heightened sensitivity to emotional cues, particularly those that are internally generated, has been termed *neuroticism* (Barlow, Ellard, Sauer-Zavala, Bullis, & Carl, 2014), *behavioral inhibition* (Carver, Avivi, & Laurenceau, 2008), or *harm avoidance* (Cloninger, Svrakic, & Przybeck, 1993). This trait has been found to reflect an overactivated security system (Elliot & Thrash, 2002; Tamir, 2005; Watson, 2000) and disproportionately reflects those who have elevated distress (e.g., Ploubidis & Frangou, 2011). Heightened sensitivity to security may be central to understanding distress disorders and how reward motivations may become overridden (Mennin & Fresco, 2014; Newman & Llera, 2011; Tamir, 2005).

Structurally, reward and threat motivations are mediated by differing but overlapping systems (Gray & McNaughton, 2000; Lang & Bradley, 2008). Within the reward system, consummatory and anticipatory facets have shared (e.g., nucleus accumbens, comprising a large part of a region called the ventral striatum; Stein & Paulus, 2009) and dissociable (e.g., the orbital frontal cortex, involved in assigning reward values to stimuli; Berridge et al., 2009) neurobiological correlates. In terms of neurochemistry, liking is primarily associated with endogenous opioids and endorphins (Stein & Paulus, 2009), whereas wanting chiefly involves dopamine, which is involved in marshaling organisms to exert the effort required to obtain a reward (Berridge et al., 2009; Stein & Paulus, 2009). Within the security system, the amygdala is activated in response to novel and immediate threats, the bed nucleus of the stria terminalis is activated in response to more distal or prolonged threats (Lang, Davis, & Öhman, 2000). Further, the ventromedial PFC is involved in higher order processing of goals reflective of safety seeking and threat avoidance. Neurochemically, norepinephrine and GABA are centrally involved in threat detection and safety signaling (Stein & Paulus, 2009).

Erroneously, emotion generation is often seen as always reflexive and regulation as always reflective (Sheppes & Gross, 2014). However, Gross’s extended process model notes that this type of cognitive elaboration can occur on any level of valuation including the first such that motivational signals can be generated reflexively (i.e., association-based activation)

recruiting relatively less elaborative systems or more reflectively (i.e., rule-based activation) to promote goal setting recruiting more elaborative systems (Carver et al., 2008; Gray & McNaughton, 2000; Higgins, 1997). Thus, emotions can be mobilized by intention but need not be (Koole & Rothermund, 2011), and often we are motivated without having a good idea of why.

In regards to contextual influence of motivational factors at the first valuation level, normative functioning represents a constant state of engaging and resolving situations that provoke conflicts of motivational systems in service of taking effective behavioral action. The security and reward systems are relatively independent and can be activated alone or in unison in response to a prompt (e.g., Stein & Paulus, 2009). Aupperle and Paulus (2010) proposed that optimal balancing of approach and avoidance systems is coordinated by a network consisting of ventromedial and orbital frontal areas of the PFC (valuation of stimuli in service of making choices; inhibiting limbic regions and behavioral responses during fear processing), the ventral striatum (orientation toward reward), amygdala/bed nucleus of the stria terminalis (providing salience/intensity of novel or prolonged threat stimuli), and the insula (monitoring current and predicting future interoceptive states in relation to reward and security and their conflict). Correspondingly, engaging behavioral actions to achieve or restore motivational balance likely consists of responding in a manner reflecting a contextually and situationally appropriate balance of reward and security systems while informing one's actions by higher order values-based decision making (Wilson & Murrell, 2004). Attaining goals that reflect motivational salience and one's personal values provides feedback relating our behavioral effort to an outcome.

Individuals with distress disorders may be subject to frequent conflicting pulls from reward and security systems. However, unlike individuals with normative distress responses, they may be relatively less effective in resolving these motivation conflicts and may generate them without sensitivity to context. Drawing upon models of motivation balancing (Aupperle & Paulus, 2010; Carver et al., 2008), individuals with anxiety and mood disorders likely struggle to overcome motivational conflicts because they possess one or more of the following deficits: (a) an overrepresentation of security valuation, (b) over- or underrepresentation of approach valuation, and (c) insufficient mediation or arbitration of approach and/or avoidance valuations. Klenk, Strauman, and Higgins (2011) offered a similar view of motivational conflict, especially with respect to GAD and MDD, by drawing from regulatory focus theory (Higgins, 1997), a normative model of promotion (i.e., reward) and prevention (i.e., security) motivations where these two systems are conceptualized as separate and mutually inhibitory of one another. In accounting for GAD, especially when it co-occurs with MDD, Klenk et al. postulated primary failure in the prevention system (i.e., hyperactivation) that in turn can lead to failure (e.g., hypoactivation) in the promotion system. One possibility is that salience in one or both of these motivational systems may increase levels of subjective intensity and corresponding distress. Although more rigorous experimental and biobehavioral research is needed, preliminary findings support a role for both motivational dysfunction (i.e., Campbell-Sills, Liverant, & Brown, 2004) and subjective intensity (i.e., Mennin, Holaway, Fresco, Moore, & Heimburg 2007) in the distress disorders.

Self-Referential Regulatory Mechanisms at the Second Valuation Level

An important feature of Gross's (this issue) extended process model of emotion regulation is the idea of dynamic and interacting valuation systems. This addition to the process model goes far to capture the complexity and nuance of human mentation. In particular, it highlights the importance of functional relationships within unfolding valuation levels. The first valuation level, characterized by emotion generation and corresponding motivational impetuses, will often need to be corrected once set in motion in order to be responsive to changing circumstances and reflections on goals and values. This regulatory effort occurs at Gross's designation of a second valuation level. This functional unfolding of emotional characteristics producing regulatory efforts is also at the core of a number of clinical theorizations of the distress disorders where strong emotional and conflicting/contrasting motivational responses produce increases in internal regulatory efforts often characterized by worry, rumination, and other forms of cognitive effort (e.g., Berenbaum, 2010; Hirsch & Mathews, 2012; Mennin & Fresco, 2014; Newman & Llera, 2011; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Tamir, 2005).

Valuation at all levels of optimal emotion regulation relies on attention and appraisal of available extrinsic cues to instantiate an initial valuation and guide subsequent valuations. However, when access to these external cues is lacking, either in situations when the actual cues are ambiguous or when one is otherwise inattentive to such cues, the valuation process is supplemented by creating internal representations of the valuation to, in effect, "fill in the blanks." Thus, one potentially important extension to Gross's (this issue) valuation system is an understanding of self-referential processing in relation to the nature of normative and disordered emotion regulation, especially in the case of distress and the distress disorders. Reflecting on one's self is a defining characteristic of being human and may represent the default state of the brain (e.g., Raichle et al., 2001). This ability to be both the actor in and the narrator of the unfolding story of our mind's experience of the world is likely to have a bearing on emotion regulation as employed at each successive valuation level. In particular, to see one's self in the context of a valuation goal with clarity of motivation and purpose represents a potentially useful form of emotion regulation and is likely to lead to a better pursuit of valuation goals.

Several forms of healthy self-referential processing have received theoretical and empirical attention. Morin (2011) posited that individuals adept at self-reflection possess superior self-knowledge (e.g., greater accuracy in one's self-concept). Further, Suddendorf and Corbalis (2007) proposed self-referencing involves *mental time travel*, which is the ability of humans to "mentally project themselves backwards in time to re-live or forwards to pre-live events" (p. 299). The ability to draw upon past events and relate them to possible outcomes in the future is likely an evolutionary advantage enjoyed by humans, and it results from the careful coordination of frontal and medial temporal memory systems (Addis, Wong, & Schacter, 2007; Okuda et al., 2003; Szpunar, Watson, & McDermott, 2007). Similarly, prospection (e.g., Gilbert & Wilson, 2007), the ability to envision in one's mind a variety of possible futures, represents another form of adaptive self-referential processing for generating, exploring, and evaluating alternatives by mentally simulating a variety of possibilities before engaging a behavioral response (Seligman, Railton, Baumeister, & Sripada, 2013).

Although these forms of self-referential mentation are likely to be beneficial in relation to emotion regulation, considerable evidence points to maladaptive forms of self-focus called negative self-referential processing (NSRP), which may produce rigid and ineffective, internally mediated regulatory efforts. In particular, three forms of NSRP have received considerable theoretical and empirical attention: rumination (e.g., repetitive thinking about past mistakes aimed at reducing distress related to perceived losses; Nolen-Hoeksema et al. 2008), worry (e.g., repetitive thinking about future events aimed at reducing distress related to perceived threats in the face of conflicting emotional and motivational states; Borkovec, Alcaine, & Behar, 2004; Mennin & Fresco, 2013; Newman & Llera, 2011), and self-criticism (e.g., evaluation of the emotional self characterized by unworthiness, inferiority, failure, guilt, and chronic fear of disapproval and rejection; Blatt, 1995). Among individuals with distress disorders, the arising of NSRPs typically follows from an inclination toward escape, avoidance, or inactivity as a means of attempting to manage emotional and motivational cues at the first valuation level (e.g., Ferster, 1973). Thus, given its ubiquity within human mentation, an important consideration is to determine what manner of and when self-referential processing facilitates or undermines emotion regulation (e.g., Aldao, Nolen-Hoeksema, & Schweitzer, 2010; Mennin & Fresco, 2013; Watkins, 2008).

Structurally, regulation efforts can be differentiated by degree of cognitive elaboration required to pursue a particular valuation goal. Regulatory components such as directed attention (Dunning & Hajcak, 2009) reside at the less elaborative end of the spectrum, whereas engagement of verbal representations (Badre & D'Esposito, 2007) are more elaborative given the greater mental effort needed to engage them. Commensurately, this effort means recruitment of a wider neural network as regulatory efforts become more elaborative, possibly involving greater activation of dorsomedial and lateral PFC areas (Ochsner & Gross, 2014). Optimal emotion regulation may be regarded as deploying the least cognitively elaborative components necessary that are contextually appropriate to the particular regulatory goal being pursued (e.g., Sheppes & Gross, 2011). Consistent with Gross's (this issue) interacting valuation systems, in order to modify security- and reward-based motivational patterns, one may rely on less elaborative regulation attempts to draw attention away from the self when necessary but also utilize more elaborative metacognitive regulation efforts to reflect on the self when motivational impetuses need to be balanced with one's goals and values in addition to the context at hand.

Individuals with distress disorders exhibit emotion regulation deficits at all levels of cognitive elaboration. For instance, these individuals are often characterized by attentional rigidity in processing both interoceptive and exteroceptive emotional stimuli (Clasen, Wells, Ellis, & Beevers, 2013; Mogg & Bradley, 2005). The ability to efficiently handle the arising of emotionally conflicting information that may perturb our goal-directed behavior (i.e., requiring us to attend to, consider, and possibly inform our actions before completing a desired action) is called *conflict monitoring* (Botvinick, Braver, Barch, Carter, & Cohen, 2001). This capacity is especially impaired in GAD individuals with and without MDD who consistently fail to shift their attention in response to a motivationally salient emotional stimuli (Etkin et al., 2010; Etkin & Schatzberg, 2011). Individuals with distress disorders also struggle to implement more verbally elaborative strategies. For example, when instructed to utilize effective emotion regulation strategies (e.g., cognitive reappraisal or

acceptance), individuals with GAD (Aldao & Mennin, 2012) or MDD (Johnstone, van Reekum, Urry, Kalin, & Davidson, 2007) expend greater resources to effectively process negative emotionally evocative stimuli. Further, individuals with distress disorders are also more likely not to employ these strategies as often as perseverative and self-critical NSRPs in response to a negative emotional state or motivational conflict, which results in increasing repetitions of self-conscious processing (Borkovec et al., 2004; Mennin & Fresco, 2013; Newman & Llera, 2011; Nolen-Hoeksema et al., 2008) and subsequent resource depletion (Muraven & Baumeister, 2000). Moreover, NSRPs can undermine effective emotion management and maintenance of distress and preclude effective emotional processing and learning (Mennin & Fresco, 2013).

Finally, as previously noted, Gross (this issue) as well as other emotion regulation theorists (e.g., Aldao, 2013; Bonanno & Burton, 2013) have recently brought attention to the matter of context in relation to the valuation and deployment of emotion regulation skills. That is, optimal emotion regulation depends on appropriately matching the manner, timing, duration, and intensity of an emotion regulation strategy to the contextual demands of a particular situation. Bonanno and Burton (2013) further posited that effective emotion regulation is associated with regulation flexibility related to the number and kind of emotion regulation strategies that individuals exhibit. First, individuals more adept at emotion regulation possess relatively larger repertoires of emotion regulation strategies. Second, individuals more adept at emotion regulation can match their strategies to the temporal demands of a situation—deploying the optimal strategy at the initial cue of a stressor situation and/or deploying a variety of strategies over the course of a stressor situation. Third, individuals effective at emotion regulation demonstrate categorical flexibility in terms of possessing many and varied strategies in their repertoire that can be deployed in a contextually optimal manner. In sum, the regulatory flexibility model, posited by Bonanno and Burton (2013) offers an interesting framework for describing optimal emotion regulation given a situation's contextual demands. However, the components of regulation flexibility (e.g., repertoire size, temporal variability, categorical variability) also correspond favorably within the rubric of cognitive elaboration: being possessed of an extensive and varied repertoire of strategies that range in elaboration and expenditure is likely beneficial compared to a narrow and impoverished repertoire.

An important area of future research will be to examine the interplay of contextual factors and self-referential processing in relation to valuation systems in emotion regulation. For instance, when there are clear external cues or overt behavioral objectives in the context of a second-level valuation, little if any engagement of self-referencing may be necessary and one may rely solely on less elaborative, attentional regulatory efforts. However, when external cues or behavioral goals are ambiguous, optimal second-level valuation may require conjuring an internal representation of the situation, perhaps drawing upon historical information to help inform the current and any additional valuations. In this respect, putatively adaptive forms of self-referential processing (e.g., prospection; Gilbert & Wilson, 2007) supplement available somatosensory information. Similarly, destructive forms of self-referential processing likely have a deleterious effect on optimal apprehending of contextual cues and behavioral goals in a second-level valuation. For instance, findings indicate that individuals with distress disorders inordinately utilize NSRPs (e.g., Olatunji, Naragon

Gainey, & Wolitzky-Taylor, 2013), which may be engaged instead of attentional resources and may promote bias in interpreting somatosensory information (Paulus & Stein, 2010).

Contextual Learning Consequences of Motivational and Self-Referential Regulatory Processing

Dobzhansky (1970) defined adaptation as the process by which an organism becomes better suited to prospering in its habitat. Behavioral adaptation is especially relevant to emotion regulation in that emitting the appropriate behavioral responses may be the difference between life and death and between love and loss. Humans typify an organism with a high degree of behavioral adaptation given their ability to proliferate to all habitats on this planet, modify their surroundings to provide protection from environmental conditions, gain advantages over other species that would otherwise compete for nourishment and possibly prey on us, and create the conditions necessary for procreation. This conceptualization is quite congruent with how Gross (this issue) and others (Aldao, 2013; Bonanno & Burton, 2013; Sheppes & Gross, 2011) have talked about the importance of context and how one might learn to balance contextual cues with personal goals and values. However, it will be particularly important for the field to demonstrate how both generative and regulatory characteristics can produce learning that leads to differential adaptation outcomes that either propels a person forward in succeeding in her or his environment or impede progress to do so.

Behavioral adaptation can be understood in terms of outcomes related to both first (i.e., emotion generation) and second (i.e., emotion regulation) valuation levels. The characteristic ways one emotionally engages and regulates external and internal stimuli will impact reward and threat learning. Optimal reward learning is a combination of assigning value to possibly rewarding stimuli, making predictions about when and where these stimuli are located, and then taking behavioral actions commensurate with these valuations and predictions (e.g., O'Doherty, 2004). Similarly, optimal threat learning requires reliable detection and response to cues that signal a clear and present danger is crucial for survival (e.g., LeDoux, 1996). However, equally important is learning to accurately detect safety cues and differentiate these signals from threat so that we do not expend valuable resources (e.g., time and energy) in attempts to escape from "nonthreats."

By contrast to this optimal functioning, individuals suffering from distress disorders often exhibit habitually inflexible and dysfunctional responses that may be the direct result of dysfunction in motivational and regulatory systems. In regards to the first valuation level, individuals with distress disorders evidence notable deficits in relation to reward and threat learning. For instance, individuals with distress disorders often exhibit impoverished and inflexible repertoires of behavior that negatively impact reward learning. Rather, their behavioral repertoires are heavily steeped in responses that promote escape, avoidance, or inactivity as a means of attempting to manage emotional/motivational signals (e.g., Ferster, 1973). Privileging escape/avoidance as a behavioral strategy can result in diminished reward sensitivity (Bogdan & Pizzagalli, 2006) and inferior discrimination of cues signaling rewards of differing value (Forbes, Shaw, & Dahl, 2007). Individuals with distress disorders

also exhibit deficits in threat and safety learning. For instance, Lissek (2012) demonstrated that individuals with anxiety disorders evidence poor stimulus generalization (i.e., deficits in discriminating from a variety of stimuli that share stimulus properties with a stimulus trained as a fearful conditioned stimulus). Individuals prone to anxiety disorders are less likely to achieve a durable and broad-based abolishment of a conditioned fear response because of deficits in detecting cues of unambiguous safety. Instead, their search for safety is often characterized by hypervigilance and overactivity, thereby resulting in an inferior and less durable acquisition of inhibitory learning (Lohr, Olatunji, & Sawchuck, 2007; Woody & Rachman, 1994).

Contextual learning deficits also result from self-referential regulatory responses. Indeed, worry results in increased threat conditionability, greater stimulus generalization, and diminished ability to discriminate stimuli and learning contingencies (Lissek, 2012; Otto et al., 2007; Salters-Pedneault, Suvak, & Roemer, 2008), and GAD is associated with restrictions in valued actions and goals (Michelson, Lee, Orsillo, & Roemer, 2011). Similarly, rumination is associated with decreases in the likelihood of new reward-based learning, weakened instrumental action, and engagement of potentially rewarding social networks (Bar, 2009; Ferster, 1973; Joormann & Tran, 2009). Moreover, Whitmer and Gotlib (2012) found that instructing depressed individuals to ruminate interfered with learning the probability that a particular stimulus would be associated with punishment. Although future research is needed to demonstrate the synergistic impact on learning of motivational and resultant self-referential processing, this research suggests that the combination of high emotional intensity coupled with a reliance on NSRPs negatively impacts emotion generative and regulatory processes and likely contributes to a negative feedback loop that maintains this dysfunctional pattern of emotional responding.

To more clearly illustrate how motivational mechanisms, self-referential mechanisms, and contextual learning consequences relate to Gross's extended process model, we offer examples of two prototypical individuals confronted with an emotionally and motivationally engaging scenario: awaiting the possibility of an interview for an exciting new job, albeit one in a new city, and having to leave the comfort and familiarity of family and friends if a job offer is made. "Jane" typifies an individual who can demonstrate optimal emotion regulation in the face of this scenario. By contrast, "Joan" suffers from distress disorders (comorbid GAD with MDD) and typifies an individual who exhibits suboptimal emotion regulation in the face of this situation. As seen in Table 1, Jane and Joan exhibit different emotion generative and regulatory responses as they both confront this exciting and stressful potential opportunity. Consequently, the contextual learning outcomes for Jane and Joan are different. Jane is able to use this experience to inform how she will face future situations marked by risk and reward. Whereas for Joan, this situation leads her to disengage from future possible rewarding opportunities in favor of protecting herself from risky situations.

Treatment Implications and Conclusions

Given that distress disorders have often resulted in less-than-optimal treatment outcomes, it is vitally important for emotion regulation conceptualizations such as those just discussed to demonstrate contributions to improving treatment. Indeed, a review of the treatment

literature reveals a number of examples of how trait levels of intense emotional responding (i.e., neuroticism; Barlow et al., 2014) and NSRPs (e.g., rumination, worry, self-criticism; e.g., Blatt, 1995; Michalak, Heidenreich, Meibert, & Schulte, 2008; Watkins et al., 2011) contribute to an inferior treatment response and/or a more fragile recovery in distress disorders. Conversely, deliberate efforts to target neuroticism (e.g., Carl et al., 2014) and NSRPs (e.g., Watkins et al., 2011; Wells et al., 2012) improve treatment efficacy and durability. The need to specifically target distress as a transdiagnostic process corresponds with a recent initiative from NIMH's National Advisory Mental Health Council, which emphasized "treatment personalization" as a means to identify factors that predict who will benefit from a given intervention process and then to systematically determine ways of matching patients to a particular treatment as well as optimizing and augmenting care.

Treatments enriched with mindfulness meditation may be well suited to addressing the problems of distress and associated motivational and regulatory mechanisms. One of the putative by-products of developing a meditation practice is reducing the reliance on self-referential processing in favor of an orientation that is largely nonjudgmental, nonreactive, and present centered in terms of one's attention and awareness (e.g., Vago & Silbersweig, 2012). Among largely healthy individuals, training in mindfulness meditation has been shown to reduce recruitment of neural regions associated with the NSRPs (e.g., Brewer et al., 2011; Farb et al., 2007) and reduce mind wandering while improving working memory capacity (e.g., Mrazek et al., 2013). Considerable evidence demonstrates the benefits of mindfulness meditation for a wide array of physical (Ospina et al., 2007) and psychiatric conditions (Hofmann, Sawyer, Witt, & Oh, 2010).

One positive development in recent years has been the emergence of CBT packages that are enriched with mindfulness meditation and/or more deliberately target NSRPs such as dialectical behavior therapy (Linehan, 1993), acceptance and commitment therapy (Hayes, Strosahl, & Wilson, 1999), MBCT (Segal, Williams, & Teasdale, 2002), behavioral activation (Jacobson, Martell, & Dimidjian, 2001), acceptance-based behavioral therapy (Roemer et al., 2008), the unified protocol (Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010), rumination-focused cognitive-behavioral therapy (Watkins et al., 2011), and emotion regulation therapy (ERT; Mennin & Fresco, 2014). These treatments have shown encouraging results in the treatment of distress disorders (e.g., Hofmann et al., 2010). In our own approach to treating distress disorders, ERT, we explicitly target both motivational and self-referential (as well as overt) regulatory mechanisms to increase behavioral flexibility and adaptation. Figure 1 displays the components of ERT that address each of the characteristics of distress disorders just discussed. In particular, we employ motivational awareness strategies to target motivational mechanisms, less and more elaborative regulation strategies to target self-referential processing and other regulation failures (e.g., reassurance seeking, behavioral avoidance), and simultaneous exposure to rewarding but highly risky contexts to increase new learning and behavioral adaptation. Preliminary efficacy and mechanism results support the ability of this intervention to target these mechanisms and improve outcomes for distress disorders (Fresco, Mennin, & Heimberg, 2013; Mennin & Fresco, 2014).

Gross's (this issue) extended process model of emotion regulation has sought to build upon his earlier model (Gross, 1998) while addressing and reconciling the prevailing empirical results to emerge in the ensuing 15 years. This exciting new model is likely to generate considerable attention for both normative and disordered emotion regulation for many years to come. We have argued that Gross's extended process model of emotion regulation has the potential to improve understanding of refractory psychopathological conditions such as the distress disorders. We suggested that to understand how normative distress may result in pathological distress, this conceptualization should also address (a) motivational mechanisms at the first valuation level, (b) self-referential regulatory mechanisms at the second valuation level, and (c) contextual learning consequences of motivational and self-referential regulatory mechanisms. With this in mind, we suggested that individuals with distress disorders are marked by greater temperamental negative affect (e.g., Krueger & Markon, 2006; Watson, 2005) and intensifying activation of underlying motivational systems that prize obtaining safety (from perceived threat) over attaining reward (Campbell-Sills et al., 2004; Klenk et al., 2011; Woody & Rachman, 1994). They evidence inferior utilization of adaptive emotion regulation strategies at all levels of cognitive elaboration (e.g., Mennin & Fresco, 2014) and, instead, often resort to NSRPs (e.g., worry, rumination, self-criticism) to compensate for inability to manage distressing emotions and motivations. The net result of these regulatory failures is a paradoxical maintenance of these negative states (Foa & Kozak, 1986; Newman & Llera, 2011) and reduced clarity in understanding and optimally responding to them. We also suggested that Gross's (this issue) extended process model and this conceptual extension may help in delineating intervention characteristics that can improve outcomes for refractory conditions such as the distress disorders. However, further research is necessary to best determine optimal practices in improving treatment outcomes and durability for the distress disorders and what part emotion regulation conceptualizations will play in determining mechanisms of action.

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Figure 1.
Conceptual model of target mechanisms, change principles, and therapeutic processes in emotion regulation therapy.

Table 1

Prototypical Case Examples of Normative and Dysfunctional Motivational and Self-Referential Mechanisms Within the Extended Process Model of Emotion Regulation.

<i>Situation: Exciting new job opportunity, albeit in a new city, and competitive application process</i>		
Valuation Level	Jane (Normative)	Joan (Distress Disordered)
First valuation (emotion generation)	Excited but cautious about this possible employment opportunity	Nervous about being rejected; desires employment opportunity but feels dejected about possibility
Second valuation (emotion regulation)	Notifies but resists urges to check for e-mail from potential new employer while at her current job	Has difficulty not checking for new e-mail in hopes of a response from the prospective employer rather than focusing on work
Third valuation (emotion regulation)	After not hearing back from them, may utilize reappraisal to respond to negative thoughts	After not hearing from them, engages in self-conscious processing (i.e., worry, rumination, self-criticism) around distress
Contextual learning consequences	Uses experience to shape value system by attending to not only motivation to protect one self but also to take further risks in service of a rewarding career possibility	Disengages from contexts with possible reward due to risk management; loses opportunities to shape values from new experiences