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Emotion Regulation as a Transdiagnostic Process

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Abstract

The current article addresses the consequences of emotion regulation (ER) for mental health. A large body of research has shown that alterations in ER are related to psychological disorders across different diagnostic categories. Due to the apparent ubiquity of ER difficulties in psychopathology, several authors have proposed that ER should be regarded as a *transdiagnostic process*. This manuscript critically examines evidence regarding alterations in the *use of cognitive ER strategies* as a transdiagnostic process. Cognitive ER strategies are examined as one example of several possible ER-related processes that could be involved in psychopathology. There is consistent evidence showing that a reduced use of cognitive reappraisal and an increased use of negative rumination are present across a number of disorders, whereas increased levels of positive rumination appear to be confined to bipolar disorder. However, there is only preliminary evidence from prospective and/or experimental studies on the causal nature of altered ER strategy use in the development or maintenance of psychopathology. The manuscript concludes by discussing future directions, including methodological and design issues, as well as implications for assessment and treatment when studying alterations in ER from a transdiagnostic perspective.

Introduction

In the past decade, clinical psychology researchers have become increasingly interested in studying the role of emotion regulation (ER) in psychopathology. Findings from this line of research show that psychological disorders are related to ER deficits (for reviews see Aldao, Nolen-Hoeksema, & Schweizer, 2010; Dryman & Heimberg, 2018). It has therefore been assumed that one consequence of (maladaptive) ER is an increased risk of the development and/or maintenance of psychopathology. Due to the apparent ubiquity of ER difficulties in psychopathology, several authors have proposed that ER should be regarded as a *transdiagnostic process* (Aldao et al., 2010). This article provides an overview of the conceptual basis of this view, summarizes exemplary current evidence on this hypothesis, and discusses future research avenues.

What is a Transdiagnostic Process?

Clinical psychology is dominated by a disorder-specific approach to both research and treatment. Recently, however, the limitations of approaches that are purely focused on distinct disorder categories have increasingly been highlighted (Harvey, Watkins, Mansell, & Shafran, 2004; Hofmann & Hayes, 2019). For example, disorder-focused approaches do not always adequately account for comorbidity and symptom overlap between disorders. Further, disorder-specific approaches pay insufficient attention to evidence showing that many risk factors are multifinal (i.e., lead to different disorders) rather than disorder-specific, as well as evidence that the same treatments successfully ameliorate these supposedly different conditions. Therefore, researchers have increasingly begun to study processes that cut across disorders.

In the absence of a universally accepted definition, the current manuscript will follow Harvey and colleagues (2004), who propose that a process needs to meet at least two requirements to be considered transdiagnostic. First, it must be present (i.e., elevated when

compared to healthy controls) across a range of different disorders. Second, the process must causally contribute to the development and/or maintenance of psychopathology, rather than being a mere epiphenomenon of these disorders. This view offers the opportunity to identify processes that – when modified through targeted interventions – can be expected to reduce (the risk of) clinical symptomatology (Morris & Mansell, 2018).

Examining Emotion Regulation as a Transdiagnostic Process

ER is a complex phenomenon comprising many different aspects and processes. Much of the research examining ER difficulties in psychopathology has been based on Gross's (1998b) seminal process model of ER, which focuses on the use of specific ER strategies and their consequences. According to this model, it can be expected that at the selection stage, individuals with psychological disorders show a lower frequency of using adaptive ER strategies and/or a higher frequency of using maladaptive strategies. In addition, they may also show a lower effectiveness in the implementation phase (see Gross, 2015) when using adaptive ER strategies. Of note, researchers have recently highlighted that flexible strategy use may additionally be important and that the outcome of ER strategies may be context-specific (Aldao, Sheppes, & Gross, 2015). As a comprehensive and systematic review on ER as a transdiagnostic process is beyond the scope of this article, we focus on three specific cognitive ER strategies, which have been proposed as transdiagnostic and have received considerable attention and empirical support across many disorders: cognitive reappraisal and positive rumination (as putative adaptive strategies), and negative rumination (as a putative maladaptive strategy). These three strategies were selected as examples to illustrate general issues related to conceptualizing ER from a transdiagnostic perspective. Due to space constraints, we were unable to cover all empirical studies on these strategies, but have selected the most relevant ones based on an extensive literature search (for details see supplementary material). Based on the criteria put forward by Harvey and colleagues (2004),

we will critically examine whether existing research offers enough evidence to classify alterations in the use of these ER strategies as transdiagnostic processes. A specific focus will thereby be to assess whether there is evidence for a causal role in the development and/or maintenance of emotional problems across disorders, as evidenced by longitudinal and/or experimental studies.

Cognitive reappraisal

According to Gross (1998b), cognitive reappraisal is a process in which a situation is reinterpreted in order to modify the emotional impact of the situation. Cognitive reappraisal is proposed to be an adaptive ER strategy[1]. As described earlier, it can be impaired in two different ways: Individuals can use cognitive reappraisal too infrequently, or individuals using cognitive reappraisal might be less effective in downregulating negative emotions.

Criterion 1: Evidence of presence across disorders

A large body of research shows that cognitive reappraisal is impaired across various disorders. Some disorders appear to be characterized by a less frequent use of cognitive reappraisal, but when patients or subclinical populations use cognitive reappraisal they can do so as effectively as healthy individuals. These disorders include depression (Dryman & Heimberg, 2018), bipolar disorder (e.g., Kjaerstad et al., 2016), and generalized anxiety disorder (e.g., Aldao & Mennin, 2012). On the contrary, other disorders, such as social anxiety disorder (Dryman & Heimberg, 2018), are characterized by a reduced effectiveness when using cognitive reappraisal. Results regarding effectiveness have been mixed for some disorders, including borderline personality disorder (Kuo, Fitzpatrick, Krantz, & Zeifman, 2018; Sauer et al., 2016) and schizophrenia (Grezellschak, Lincoln, & Westermann, 2015; Visser, Esfahlani, Sayama, & Strauss, 2018).

[1] Please note that from an ER flexibility perspective, cognitive reappraisal may also be an inappropriate or even maladaptive strategy to regulate emotions in some contexts.

Criterion 2: Causality

There are numerous studies demonstrating a relationship between cognitive reappraisal and psychopathology. However, most studies have relied on cross-sectional and correlational designs and therefore cannot assess whether cognitive reappraisal could be a risk or a maintaining factor of those disorders.

Results from longitudinal studies suggest that a higher frequency of using cognitive reappraisal predicts lower psychopathology. For instance, the use of cognitive reappraisal predicted fewer symptoms of depression and anxiety eight months later in college students (Brewer, Zahniser, & Conley, 2016). In several prospective studies, cognitive reappraisal was furthermore found to be a moderator or a partial mediator between stress or stressful life events and subsequent emotional problems (e.g., Zahniser & Conley, 2018). In addition, cognitive reappraisal predicted reductions in depression over the period of one year in patients with bipolar disorder (Johnson, Tharp, Peckham, & McMaster, 2016). On the other hand, in an ecological momentary assessment study, cognitive reappraisal did not predict subsequent positive emotions (Vilardaga, Hayes, Atkins, Bresee, & Kambiz, 2013), and in a recent prospective study, cognitive reappraisal did not predict wellbeing 2.5 years later (Kelley, Glazer, Pornpattananangkul, & Nusslock, 2019). Furthermore, the use of cognitive reappraisal mostly did not predict paranoia in prospective and ecological momentary assessment studies (Nittel et al., 2018; Westermann, Boden, Gross, & Lincoln, 2013; but see Gollwitzer, Wilczynska, & Jaya, 2018, for contrasting results).

Another group of studies has tested whether psychological interventions lead to increased frequency and/or effectiveness of cognitive reappraisal, and whether this is in turn related to changes in psychopathology. In treatment studies with patients with anxiety disorders (e.g., Goldin et al., 2012), an increase in self-reported effectiveness in using cognitive reappraisal resulted in subsequent reductions of anxiety. Of note, bi-directional effects were reported in about half of the studies (Smits, Julian, Rosenfield, & Powers, 2012),

which is in line with the suggested causal role of reappraisal, but additionally supports a mutually maintaining relationship between reappraisal and symptoms. In contrast, in a study on posttraumatic stress disorder cognitive reappraisal was changed throughout the treatment, yet this change did not predict changes in symptoms at the follow-up assessment (Jerud, Pruitt, Zoellner, & Feeny, 2016).

A third group of studies has investigated the effects of instructed cognitive reappraisal on emotion and/or symptom measures. Results show that cognitive reappraisal leads to reduced levels of sadness, anxiety, disgust and/or anger as compared to no instruction (Gross, 1998a; Keng, Robins, Smoski, Dagenbach, & Leary, 2013; Wolgast, Lundh, & Viborg, 2013) or other ER strategies (Hofmann, Heering, Sawyer, & Asnaani, 2009; Szasz, Szentagotai, & Hofmann, 2011). In addition, participants high in contamination fears were better at reducing their emotion of disgust when trained in cognitive reappraisal as compared to participants with no cognitive reappraisal training (Olatunji, Berg, Cox, & Billingsley, 2017). In participants high in social anxiety, a short cognitive reappraisal training led to lower symptom severity at post test; however, a daily diary showed that most participants used other ER strategies in addition to and at the same time as cognitive reappraisal (Kivity & Huppert, 2016).

Summary of Cognitive Reappraisal Findings

There is ample evidence that reduced use and/or reduced effectiveness of cognitive reappraisal is present across various disorders. However, fewer studies have investigated the causal role of these findings as a risk or maintaining factor. Results from most (albeit not all) longitudinal studies converge in showing that a reduced *frequency* of cognitive reappraisal is a risk factor for anxiety and depression. On the other hand, prospective evidence on a relationship between reduced *effectiveness* and psychopathology is scarce. Furthermore, current findings in psychosis imply that a reduced use of cognitive reappraisal may be an epiphenomenon of psychosis rather than a risk factor for future psychotic episodes. Results

from a small number of treatment studies and laboratory-based experimental studies support a causal link between the use of cognitive reappraisal and reduced negative emotions as well as symptoms, although there is also evidence for a bi-directional relationship.

Rumination

Rumination is a frequently studied and putative maladaptive ER strategy related to cognitive change. When individuals ruminate, they direct their attention to their emotions as well as the causes, meanings, and consequences of those emotions (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

Negative rumination

Rumination on negative emotions, negative events, or negative aspects of the self has been extensively covered in earlier reviews, the results of which we briefly summarize here.

Criterion 1: Evidence of presence across disorders

Increased frequency of rumination focusing on negative content has been found to be associated with numerous disorders, including depression, anxiety disorders, posttraumatic stress disorders, eating disorders, substance use disorders, and insomnia (for a review, see Ehring & Watkins, 2008).

Criterion 2: Causality

There is considerable evidence from prospective studies showing that rumination on negative content predicts the development and/or maintenance of emotional disorders, including depression, anxiety disorders, posttraumatic stress disorders, and eating disorders (Ehring & Behar, in press; Thomas Ehring & Watkins, 2008). In addition, there is experimental evidence showing that interventions targeting rumination reduce symptomatology (Ehring & Behar, in press) and that induced rumination leads to the maintenance of a negative mood as well as to other psychopathology-related cognitive, interpersonal, and physiological changes (Watkins, 2008).

Positive rumination

Positive rumination comprises recurrent thoughts about positive affective states, positive qualities in the self, and positive personal life circumstances.

Criterion 1: Evidence of presence across disorders

Positive rumination appears to be a resilience factor (i.e., protective factor) for several emotional disorders (Harding & Mezulis, 2017) and is negatively correlated with depressive symptoms (e.g., Burke et al., 2015); it may thus generally be viewed as an adaptive ER strategy. However, positive umination has also been found to be maladaptive in certain contexts, as it is positively correlated with symptoms of (hypo-)mania (e.g., Bijttebier, Raes, Vasey, & Feldman, 2012) and a higher frequency of manic episodes (Gruber, Eidelman, Johnson, Smith, & Harvey, 2011). Moreover, patients with bipolar disorder typically display more positive rumination compared to patients with major depressive disorder (e.g., Weinstock, Chou, Celis-dehoyos, Miller, & Gruber, 2018). In a study examining the association between positive rumination and symptoms of anxiety disorders, on the other hand, no associations or only small associations were found (Eisner, Johnson, & Carver, 2009). This may suggest that elevated frequency of positive rumination is not a broad transdiagnostic process, but rather a dysfunctional process that may be more prominent in bipolar disorder compared to other disorders, and may be adaptive in healthy individuals.

Criterion 2: Causality

There are very few longitudinal and experimental studies that assess positive rumination and symptoms of (hypo-)mania. Positive rumination predicted hypomanic symptoms three months later in a community sample of children (Bijttebier et al., 2012). However, in a clinical adult sample, positive rumination did not differentially predict manic symptoms six months later in bipolar disorder compared to major depressive disorder (Gilbert et al., 2013). In an experimental study, induced positive rumination increased positive

emotions in both depression as well as bipolar disorder (Gilbert, Nolen-Hoeksema, & Gruber, 2013).

Summary of rumination findings

Whereas negative rumination is associated with a range of disorders and appears to be causally involved in their development and/or maintenance, elevated positive rumination appears to be specific for manic symptoms; in addition, the limited amount of research on positive rumination has revealed mixed results regarding causality.

Conclusions and Future Directions

In sum, there is emerging evidence that some ER strategies (cognitive reappraisal and negative rumination) may be transdiagnostic processes. There is extensive and quite consistent evidence that impairments in the frequency of selecting those strategies are present across disorders (i.e., meeting the first criterion proposed by Harvey et al., 2004). However, evidence about the causal nature of altered ER selection in the development and/or maintenance of psychopathology is still scarce and mixed. Current findings regarding positive rumination suggest that this may be a rather disorder-specific maladaptive ER strategy with relevance for bipolar disorder and can even be adaptive in individuals not suffering from the disorder.

Whereas a certain pattern of *frequency of engagement in ER strategies* appears to be ubiquitous, it remains to be tested whether the *effectiveness* of using adaptive ER strategies when instructed may show a more disorder-specific pattern. Specifically, whereas a pattern of problematic ER strategy use but intact ER effectiveness may be characteristic of certain disorders, other disorders may be related to more basic deficits in downregulating emotions. More research is clearly needed to directly test this hypothesis.

On a general level, one conclusion to be drawn from our review is that the question as to whether ER is a transdiagnostic phenomenon is too broad and therefore not very

informative, neither from a theoretical nor from a clinical perspective. Instead, it appears necessary to use fine-grained distinctions between different aspects of ER, and to rigorously study their transdiagnostic vs. disorder-specific roles. In order to increase our understanding of the consequences of ER on psychopathology, we propose that future research needs to take the following issues into account.

1. Theoretical refinement. It is necessary to identify the key components of ER that are thought to be involved in the development and/or maintenance of psychopathology, and integrate them into a conceptual model. Whereas the current review has focused on alterations of frequency and the effectiveness of selected single ER strategies, additional constructs may include reduced flexibility of ER (Aldao et al., 2015), or problematic ER goals (Gross & Jazaieri, 2014). In addition, the model should include processes that may underlie these observable ER alterations, e.g., cognitive control (Joormann & Vanderlind, 2014). Furthermore, it is important to distinguish ER from other (potentially transdiagnostic) processes that contribute to emotion-related problems in psychopathology, such as emotion reactivity (see also Gross & Jazaieri, 2014).

2. Investigating ER across disorders. In order to test Harvey et al.'s (2004) first criterion for transdiagnostic processes, candidate processes need to be systematically compared between different groups of disorders. This requires studies that focus on more than just one disorder at a time, and ideally also include more than one process. It is conceivable that this research strategy will lead to the identification of both transdiagnostic ER-related processes as well as characteristics of ER that turn out to be disorder-specific (see e.g., the case of positive rumination).

3. Testing causality. The mere presence of a certain process across disorders does not necessarily imply that it is causally involved in the development and/or maintenance of psychopathology. Therefore, the causality of this relationship needs to be rigorously tested. We propose testing with a combination of three different designs, namely (a) longitudinal

studies assessing the prospective association between a specific ER alteration and future symptom levels or diagnoses when controlling for other baseline factors; (b) experimental studies showing that a manipulation of certain ER processes has an impact on symptoms and/or disorder-related processes in the short-term (to be investigated in laboratory studies) and in the long-term (to be investigated in treatment studies); and (c) ecological momentary assessment studies testing the temporal relationship between ER processes and symptoms in daily life.

4. Transdiagnostic interventions. One promise of transdiagnostic approaches to psychopathology is to develop more efficacious interventions by selecting them based on the specific pattern of relevant transdiagnostic processes present in an individual rather than using disorder-specific interventions (Hofmann & Hayes, 2019). Interventions targeting these specific ER-related processes are currently being developed and evaluated. One such example is ER therapy, which targets negative self-referential processes including rumination and offers specific training in cognitive reappraisal that is meant to promote more positive self-referential processing (Renna, Quintero, Fresco, & Mennin, 2017).

5. Improving assessment. To offer individualized ER treatment, assessment tools have to be improved so that therapists can use more reliable and valid assessment instruments that identify and discriminate ER-related processes and offer diagnostic differentiation utility at an individual level.

To conclude, the existing literature leaves no doubt that alterations in ER can be found across disorders. However, research regarding the impact of ER on the development and maintenance of psychopathological symptoms is still limited. Therefore, it appears that research into the transdiagnostic nature of ER needs to be refined on both a theoretical and methodological level in order to have a more substantial impact on our understanding and, ultimately, our treatment of psychological disorders.

Recommendations for Additional Reading

Brewer, S. K., Zahniser, E., & Conley, C. S. (2016). Longitudinal impacts of emotion regulation on emerging adults: Variable- and person-centered approaches. *Journal of Applied Developmental Psychology*, *47*, 1–12. https://doi.org/10.1016/j.appdev.2016.09.002

This is one of the few prospective studies using a large sample to test the longitudinal impact of ER strategy use on symptoms of psychopathology.

Dryman, M. T., & Heimberg, R. G. (2018). Emotion regulation in social anxiety and depression: a systematic review of expressive suppression and cognitive reappraisal. *Clinical Psychology Review*, *65*(2), 17–42. https://doi.org/10.1016/j.cpr.2018.07.004

This systematic review focuses on two ER strategies (cognitive reappraisal and expressive suppression) in depression and social anxiety disorder. In addition to correlational studies it also discusses causal relationships.

Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally-occurring depressed mood. *Cognition & Emotion, 7*, 561–570. https://doi.org/ 10.1037/0021-843X.102.1.20

This is a seminal experimental study investigating the effects of rumination on the maintenance of depressed mood. The paradigm developed in this study has subsequently been used extensively to test the causal role of negative rumination.

Fernandez, K.C., Jazaieri, H., & Gross, J.J. (2016). Emotion regulation: A transdiagnostic perspective on a new RDoC domain. Cognitive Therapy and Research, 40,426. https://doi.org/10.1007/s10608-016-9772-2

Interesting review paper examining ER on the background of the Research Domain Criteria (RDoC) framwork, another important transdiagnostic view on processes involved in psychopathology.

Renna, M. E., Quintero, J. M., Fresco, D. M., & Mennin, D. S. (2017). Emotion regulation therapy: A mechanism-targeted treatment for disorders of distress. *Frontiers in Psychology, 8*: 98. https://doi.org/10.3389/fpsyg.2017.00098

This article depicts ER therapy as a treatment for distress disorders (including generalized anxiety disorders and MDD) as well as the associated functional model underlying ER therapy

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