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How Flexible are we in Regulating our Emotions? A Discussion on Current Conceptual Frameworks of Emotion Regulation Flexibility, Requirements for Future Research and Potential Practical Implications

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Abstract. Are we flexible in using different strategies to regulate our emotions during our daily functioning? What are the personal and situational mechanisms accounting for this complex set of emotion regulation (ER) processes? And to what extent different forms of ER flexibility are adaptive? Current empirical evidence challenges a static view of ER strategies as inherently adaptive or maladaptive. This has led contemporary accounts to consider the variation in use of ER strategies across time depending on the complex interplay of personal characteristics, specific situational demands, and motivational goals. However, despite the relevance of these new approaches and their obvious theoretical and practical implications, the study of ER flexibility is a relatively young research field, still lacking common integrative views. In this paper, I briefly discuss the shared and unique components across different theoretical frameworks of ER flexibility and make recommendations for future research to advance the understanding of this crucial phenomenon. I identify specific questions that may be contrasted through programmatic research lines and propose that the integration of cognitive mechanisms known to affect ER may help to advance the science of ER flexibility. I also enumerate a series of methodological approaches that can be used to tests proposed models of ER flexibility. Finally, I highlight potential practical implications that can be derived from these new research programs in order to improve interventions aimed at promoting adaptive ER flexibility and adaptive functioning.

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The ability to regulate emotions, namely to modulate their intensity, frequency, and/or duration, is central to multiple areas of psychosocial functioning, including mental health (John & Gross, 2004; Nezlek & Kuppens, 2008), social functioning (Eisenberg et al., 2000), or academic and work performance (Grewal et al., 2007). Conversely, emotion regulation (i.e., ER) difficulties are linked to longer and more severe distressing periods that may evolve into multiple forms of psychopathology. Previous meta-analytic research suggested that the extent to which individuals use different ER strategies might reflect risk factors for, or protective factors against, different forms of psychopathology, such as depression, anxiety, substance abuse or eating disorders, among others (Aldao et al., 2010; Webb et al., 2012). Specifically, ER strategies such as reappraisal and problem solving have been extensively considered as adaptive, whereas other strategies such as avoidance and rumination have been typically conceptualized as maladaptive. However, increasing research during the last decades has challenged this static view, arguing that, when the use of these strategies is tested in specific contexts, they may not be intrinsically (mal)adaptive for every type of situation. In contrast, they would be

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specifically adaptive to the extent that they fit to the specific appraisals of the situation. For instance, in the context of stress regulation, research has shown that reappraisal is less successful than distraction to regulate stress perceived as highly intense (Sheppes et al., 2009; Sheppes & Meiran, 2008). In contrast, reappraisal has been found to be particularly effective for regulating low-intensity stressors perceived as uncontrollable, but maladaptive when overgeneralized to deal with stressors perceived as controllable (Troy et al., 2013). As such, it has been proposed that the most effective strategies in cases of perceived controllability would comprise strategies allowing for active coping and situational modification (Troy, 2015). Even for ER strategies typically assumed to be used inflexibly, and thus to be inherently maladaptive, such as rumination (Kashdan & Rottenberg, 2010), some studies suggest that they might sometimes be adaptive, such as when used to assist problem-focused active coping (see Nolen-Hoeksema et al., 2008).

This complex set of context-based ER mechanisms has been integrated into the study of ER flexibility processes and their contribution to psychological adaptation (Aldao et al., 2015). Current frameworks thus overpass a static view on the (mal)adaptiveness of specific ER strategies and instead consider the variation in the use of ER strategies across time depending on the interplay of personal characteristics, specific situational demands, and motivational goals (Aldao et al., 2015; Bonanno & Burton, 2013). However, despite the relevance of these newer approaches and their obvious theoretical and practical implications, the study of ER flexibility is still a relatively young research area. The field still lacks common integrative conceptualizations and guidelines on empirical ways to assess the phenomenon and its underlying mechanisms. In this paper, I briefly discuss the shared and unique components across different theoretical frameworks of ER flexibility (Aldao et al., 2015; Bonanno & Burton, 2013; Gross, 2015), and make recommendations for future research to advance the understanding of this crucial psychological function.

Conceptual Frameworks of ER Flexibility: Proposal of An Integrative Approach

As highlighted above, the frequency of use of different ER strategies as well as their effectiveness to regulate target emotions depend both on contextual and personal factors. Empirical research has shown that the application of ER strategies and their effectiveness is modulated by the perceived emotional intensity of the ongoing situation (e.g., Hay et al., 2015; Shafir et al., 2016; Suri et al., 2018), its perceived controllability (e.g., Troy et al., 2013, 2017), as well as the role of active motivational goals (e.g., English et al., 2017; Millgram et al., 2019; Tamir et al., 2015). This has led authors to propose different approaches to conceptualize this context-based ER flexibility. In all cases, models share the proposal that the use and effectiveness of ER strategies must be understood in a more situational manner (Aldao et al., 2015; Bonanno & Burton, 2013; Gross, 2015). Yet, each model pays different attention to different aspects in the conceptualization of context-based ER flexible dynamics.

Building from previous conceptual proposals for the general study of psychological flexibility (Hollenstein et al., 2013; Kashdan & Rottenberg, 2010), Bonanno and Burton (2013) identified a series of causal factors determining regulatory flexibility. While emphasizing the importance of contextual factors in accounting for flexible regulation, the model focuses on the main role of individual differences in flexibility mechanisms of *context sensitivity* -the ability to perceive impinging demands and opportunities from the context-, *repertoire of regulatory strategies* -the ability to utilize a wide range of strategies that might accommodate divergent contextual demands and opportunities-, and *feedback* -the ability to monitor and use feedback about the efficacy of a chosen strategy over time so as to adjust or correct behaviour when needed-. This model elegantly integrated up-to-date empirical research on each of these potentially central mechanisms to understand why some people are more flexible than others in regulating their emotions. However, despite that a temporal iterative sequence of influence between mechanisms (i.e., context sensitivity, repertoire and feedback abilities) is defined, the focus on individual differences in these mechanisms still implies to some extent a focus on person trait-based explanatory factors. Further, this approach still lacked an actual operational framework to study normative processes of time/context-changing ER flexibility and its adaptiveness.

This issue can be solved through current formulations of Gross' extended model of ER (e.g., Gross et al., 2019), which is built from former proposals (Gross, 2015) and allow to study ER flexibility from a process-based perspective. Gross and colleagues segment ER into four separable valuation systems, corresponding to different inter-related stages of iterative ER cycles: *Identification* –deciding whether the current emotional state should be regulated-, *selection* –deciding which ER strategy to use-, *implementation* -deciding which specific actions in relation to the preferred strategy to take and implementing them- and *monitoring* -deciding whether to maintain, switch or stop the ongoing affect regulation attempt-. Effective functioning of the first three inter-related stages would depend on the adequate representation of the ongoing emotional state, regulatory options and specific related actions to take, as well as on the adequate evaluation of costs and benefits for each of these

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options at the given stage. Effective monitoring and consequent maintenance, stopping or switching would, in turn, depend on the adequate processing of inputs of resulting affective and contextual changes (Gross et al., 2019). From this perspective, it is easy to integrate how individual differences proposed by Bonanno and Burton (2013) on context-sensitivity might affect different stages of ER identification, selection or monitoring, while repertoire abilities might account for differential functioning in selection and implementation stages, and feedback abilities might form the basis of efficient monitoring. Nonetheless, before going through the study of personal moderating factors implicated in ER flexibility stages, views such as the one from Gross make evident that flexibility would be possible only if all these different components are functioning properly in relation to environmental circumstances. In my opinion, it is thus first imperative to understand the normative ways through which ER flexibility processes unfold over these context-based stages and ultimately contribute (or not) to adaptation to environmental demands (either external or internal) triggering ER processes.

This view is in line with the proposal of Aldao and colleagues (2015), who provide an operative definition of ER flexibility for studying its normative processes of action that was still lacking from previous theoretical perspectives. In short, Aldao and colleagues argue that the extent to which time-changing ER variability is synchronized with environmental changes reflects ER flexibility, although not necessarily adaptiveness. This differentiation allows for the study of specific context-based ER flexibility patterns, while further requiring to establish their role for adaption as a function of the resulting outcomes in terms of meaningful goal achievement.

Overall, I argue that the conceptual proposals focused on ER flexibility outcomes, such as the one from Aldao et al. (2015), are highly pertinent to inform new research on ER flexibility and its adaptiveness in controlled experiments (i.e., time-varying manipulations of contextual and motivational factors requiring implementation of different forms of ER strategies) and naturalistic contexts (i.e., use of tools such as experience sampling methods [ESM], to comprehensively monitor time co-variations among contextual and motivational demands, ER strategy use, resulting affect and the fit of such outcomes to initially triggering regulatory goals). I also argue that such modeling approaches must be used in a way that allow to study ER flexibility components within the different stages where ER unfolds, in order to understand how they are initiated, maintained and terminated (Gross et al., 2019). Ultimately, the inclusion of the study of personal moderators (Bonanno & Burton, 2013), in terms of individual differences in different required abilities for ER flexibility will be of high relevance, although a previous necessary step would be thus determining the normative forms of ER flexibility for different ER strategies and their outcomes across the entire ER process. Consequently, we should create specific models to test hypothetical specific forms of context-based ER strategy use in response to specific situational demands/appraisals and/or types of goals in order to then establish the extent to which they contribute to goal achievements.

Methodological Approaches to Study Intra-individual Processes of ER Flexibility

The proposed research program necessarily requires advanced methodological designs and computational tools. The most direct approach to sample normative ER flexibility processes within and across multiple ecological contexts is taking advantage of contemporary ESM techniques (Brans et al., 2013). Whereas initial research on context-based ER flexibility relied on broad daily self-reports (Cheng, 2001), ESM studies can be used to monitor these processes as they unfold during specific daily life events. Promising initial work has indeed started to be conducted through ESM studies considering the role of momentary appraisals of emotional intensity and controllability in the momentary use of strategies such as rumination (Kircanski et al., 2017), reappraisal or active coping (Haines et al., 2016). Similarly, further ESM work has started to consider the role of both contextual appraisals and active motivational goals (i.e., prohedonic or instrumental) and their interaction to influence momentary use of different ER strategies (Wilms et al., 2020). This initial work can now further be integrated into more advanced models to delineate not only the influence of mental representations of different contextual demands and/or opportunities on ER use, but to establish whether they influence each other, as suggested by the process-based approach (Gross et al., 2019). For instance, it can be tested whether purported identification-based steps of emotional intensity and "need to change" appraisals interact with selection-based cost-benefit analyses of controllability and/or self-efficacy appraisals to decide which ER strategy, among the ones available, is the most indicated (e.g., whether to use reappraisal vs. active coping as function of high or low emotional intensity demands depending on their high or low perceived controllability). Consequently, it could be tested whether the perceived degree of goal achievement (i.e., goal fit) predicts the maintenance or change of ongoing context-based ER strategy usage across consecutive moments, and how momentarily active goals are self-maintained or sensitive to contextual changes resulting from the iterative ER process (for an alternative trait-based motivational approach of self-regulation see, for instance, Klenk et al., 2011).

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ER flexibility dynamics need to be understood as they unfold in daily life functioning, although this does not imply that experimental studies are not still crucial to test predictions in a rigorous and controlled manner (Aldao et al., 2015). Despite its marked ecological validity, ESM studies may be limited to differentiating separate functions of identification, selection, implementation and monitoring across the iterative ER process (Gross et al., 2019). This can be solved through controlled studies that take advantage of ESM-based intensive sampling of emotional experiences but adding specific manipulations within the ER process sequence in the laboratory. For instance, new experimental paradigms are starting to be developed to allow activating different forms of regulatory goals in a controlled manner, both within ongoing contexts as well as across sequential contexts, which can allow testing several of the different open questions highlighted above. For instance, Sanchez et al. (2017) adapted a typical stress induction task (i.e., giving a speech in front of confederates showing facial expressions of approval or rejection, e.g., Lin et al., 2015), in a way that allowed to test flexible adjustment of attention strategies (i.e., context-based changes of gaze toward positive vs. negative feedback) as a function of changes in social feedback received (i.e., from emotionally balanced to clearly rejecting social feedback). Further recent work (Godara et al., 2021) has continued testing complex sets of this time-varying social context (i.e., from emotionally balanced to clearly rejecting or approving social feedback) as a function of temporally active regulatory goals (i.e., to focus on positive feedback to be confident about their speech vs. to focus on negative feedback to solve concerns of the jury). This opens the possibility to manipulate contexts and motivational goals under controlled conditions that allow us to study the implementation of multiple ER strategies as a function of resulting context-based appraisals as well as its affective consequences, as a matter of (un) successful goal achievement, under time-varying conditions making possible to isolate specific stages of the ER process. Further, recent experimental approaches can also be used to test processes of ER flexibility across sequential processes of varying goals within given contexts but also as a function of the variations in both contextual demands and resulting goals (see also Godara et al., 2020).

Integrating the Study Individual Differences in Cognitive Mechanisms to Account for (In)Efficient Forms of ER Flexibility

Advancing on the knowledge of normative processes of ER flexibility within and across context-changing demands and goals may provide the optimal scenario to then establish potential personal moderators of such processes, in line with Bonanno and Burton's (2013) proposal. Specifically, the role of individual differences in biased cognitions (i.e., tendencies to preferentially attend, interpret and remember specific affective information) and cognitive control functions (i.e., abilities to update relevant information in working memory, inhibit the processing of distracting information and/or shift among different mental sets) has been largely proposed to causally influence (dys)functional ER processes (e.g., Joormann & Vanderlind, 2014). Previous empirical evidence consistently supports relations among the habitual use of ER strategies, such as rumination or reappraisal, and tendencies to attend and interpret ambiguously affective material (e.g., Everaert et al., 2016). Further recent research demonstrates a causal role of these cognitive mechanisms in the modulation of the momentary use of these ER strategies in laboratory settings (Sanchez-Lopez et al., 2019; Sanchez et al., 2016). Current methodological advances allow disentangling bottom-up tendencies of cognitive processing from specific difficulties in top-down cognitive regulation (see, for instance, Sanchez et al., 2015). Thus, there are new methods well-suited to study the flexible modulation of cognitive processes as a function of time-varying contexts and goals, and to test their role as proximal mechanisms of ER (in)flexibility.

For instance, new paradigms allow disentangling biased tendencies to interpret ambiguous information as positive or negative from specific components of interpretation inflexibility across time-changing social contexts. In these studies, it is shown that interpretation inflexibility accounts for individual differences in depressive and anxiety symptomatology (Everaert et al., 2018), and that this influence is exerted indirectly through the use of specific ER strategies (Everaert et al., 2020). These cognitive mechanisms are very relevant, given that interpretation tendencies are on the basis of the way that contextual demands are appraised, and interpretation flexibility can thus also be important in influencing the enactment of efficient regulatory strategies. Ultimately, elaborative processes of interpretation and memory depend on the way that environmental (either external or internal) demands are attended (Chun & Turk-Browne, 2007). Relatedly, novel approaches to evaluate (Godara et al., 2020) and manipulate attention flexibility in response to changes across contexts and goals (Godara et al., 2021) have also started to show very promising results, suggesting a role of attention flexibility mechanisms to account for adaptive behavior across different contextual and motivational demands (Godara et al., 2021).

As mentioned above, attention and interpretation processes may reflect default processing tendencies (potentially central for phases of identification, selection

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and implementation; Gross, 2015), but also depend on cognitive control functions that are crucial for adequate monitoring and resulting maintenance, switch or termination of ER actions (Gross et al., 2019; Bonanno & Burton, 2013). Former research has supported the role of cognitive control functions such as working memory updating, inhibition and switching on the habitual use of different ER strategies (Cohen et al., 2014; Pruessner et al., 2020). However, it remains to be established how these top-down control functions support related mechanisms of attention and interpretation flexibility and, ultimately, momentary abilities of ER monitoring to support adaptive ER flexibility. Along this line, current conceptual frameworks, as the one proposed by Pruessner et al. (2020), are highly promising to inform new research considering how different facets of cognitive control account for distinct forms of ER flexibility at the stage of ER monitoring. Integrating different perspectives from cognitive and motivational research will therefore be crucial in order to establish the relevance of cognitive mechanisms to account for (in)flexible goal-directed regulatory behaviors within and across emotional contexts. Once this preceding step is met, we should then be able to better understand specific mechanisms of ER (in)flexibility, how they can evolve to psychopathological emotional dysfunctions and, consequently, through which mechanisms can these dysfunctions be intervened.

Practical Implications of New Open Research Lines in ER Flexibility

Emotional dysregulation is acknowledged to be a transdiagnostic feature across multiple psychological disorders (Aldao et al., 2016), and its intervention is central for many psychological interventions, including cognitive-behavioral therapy (Plate & Aldao, 2017), mindfulness training (Guendelman et al., 2017) and emotion regulation therapy (Renna et al., 2017). From the conceptual view proposed in this article, emotion dysregulation is the outcome of the inflexible use of ER strategies leading to limited adaptive outcomes (i.e., poor goal achievements). The conceptual and methodological proposals formulated here to improve our understanding of normative processes of ER flexibility, underlying mechanisms and conditional adaptiveness may thus also open exciting venues for future clinical practice.

First, establishing advanced knowledge of ER flexibility may be capital for an adequate evaluation of its impairments, guiding future personalized interventions for specific problems of emotional dysregulation. Relying on advanced ESM-based tools for ecological monitoring of not only affective states, but also of the contexts where they occur, active motivational goals, use of specific ER strategies and their effectiveness to achieve pursued goals, may be an important addition to self-registration techniques used between clinical sessions (see a related proposal in Aldao et al., 2015). Further, current technical developments in cognitive bias assessment (Sanchez-Lopez et al., 2019) allow to also integrate the evaluation of potential cognitive mechanisms of ER flexibility within these advanced evaluation protocols. Ultimately, adequate monitoring of dynamics of cognitive processes, motivational states and ER flexibility patterns, within- and across-contexts, may help to identify the most optimal intervention techniques for specific emotion dysregulation issues of each patient, leading to new improvements in personalized treatments. Along this line, the inclusion of these techniques and specific analytic tools to disentangle individual problems at specific stages of the ER process may help to personalize protocols of intervention actively working on each of these stages and their implicated mechanisms. For instance, mindfulness interventions have demonstrated success in the alteration of aberrant attentional tendencies in affective processing (Roca & Vazquez, 2020) and in improving cognitive control functions (De Raedt et al., 2012), indicating promise for personalized approach in cases reflecting impairments in identification and/or monitoring stages of the ER process. Further, new training approaches are being developed to directly intervene on cognitive mechanisms of ER flexibility, as a function of changing contexts and goals (Godara et al., 2021). Ultimately, these new interventions can also be integrated into new multi-component flexibility interventions that aim to train mechanisms subserving cognitive and ER flexibility processes and ultimately reduce psychological distress and emotional dysregulation. Finally, these advances will be important not only to intervene most precisely in affective psychopathology but also to promote psychological well-being in the general population. In this sense, whereas most of the conceptual and empirical knowledge on ER flexibility has been developed in the context of stress and negative affect regulation, it is necessary to extend its study into the understanding of ER flexibility dynamics in the regulation of positive emotions. Cultivating positive emotions in daily life has been established to be very beneficial for general health and psychological well-being (Fredrickson, 2000). Thus, knowing what ER strategies influence the maintenance of positive affect, and whether this is done through the same flexibility mechanisms than are implemented for adaptive stress and negative affect regulation will be essential for progress in the field.

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