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The Future of Emotion Regulation Research: Capturing Context

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Abstract

Emotion regulation has been conceptualized as a process by which individuals modify their emotional experiences, expressions, and physiology and the situations eliciting such emotions in order to produce appropriate responses to the ever-changing demands posed by the environment. Thus, context plays a central role in emotion regulation. This is particularly relevant to the work on emotion regulation in psychopathology, because psychological disorders are characterized by rigid responses to the environment. However, this recognition of the importance of context has appeared primarily in the theoretical realm, with the empirical work lagging behind. In this review, the author proposes an approach to systematically evaluate the contextual factors shaping emotion regulation. Such an approach consists of specifying the components that characterize emotion regulation and then systematically evaluating deviations within each of these components and their underlying dimensions. Initial guidelines for how to combine such dimensions and components in order to capture substantial and meaningful contextual influences are presented. This approach is offered to inspire theoretical and empirical work that it is hoped will result in the development of a more nuanced and sophisticated understanding of the relationship between context and emotion regulation.

Keywords

emotion regulation, strategies, affect, context, psychopathology

The construct of emotion regulation was first introduced in the developmental literature as part of a framework that deemphasized differences among discrete emotions in favor of the processes, or dynamics, affecting all emotions (e.g., onset, duration, intensity; Thompson, 1994). The goal of emotion regulation is not to eliminate "maladaptive" emotions and replace them with "adaptive" ones but rather to influence the dynamics of each emotion in order to produce adaptive responses to the environment. For example, if someone is extremely anxious about giving a presentation at work, such emotional intensity might result in a fight-or-flight response and therefore interfere with that person's ability to stay in front of the audience. Conversely, if that same person is not experiencing any anxiety whatsoever about this presentation, she or he might have difficulties staying on task and engaging the audience. Therefore, at that particular time, for that given individual, there is an amount of anxiety that will be activating enough to be mobilizing, yet not so intense that it will lead to freezing or fleeing. The goal of the regulatory process is to reach optimal levels of emotion dynamics, so that emotions can facilitate appropriate responding to the ever-changing demands of the environment.

In the late 1990s, the study of emotion regulation gained new popularity when James Gross conceptualized it from a social psychology perspective by emphasizing the use of emotion regulation strategies to modify the emotion dynamics and/or the situations giving rise to such dynamics. Gross (1998a) described emotions as input–output processes that

> … begin with the evaluation of external or internal emotion cues. Certain emotions trigger a coordinated set of behavioral, experiential, and physiological emotional response tendencies that together facilitate adaptive responding to perceived challenges and opportunities. However, these response tendencies might be modulated, and it this modulation that gives final shape to manifest emotional responses. (p. 225)

Gross differentiated between two types of regulation strategies on the basis of whether they influence emotions at the input (i.e., antecedent focused; e.g., cognitive reappraisal) or at the output (i.e., response focused; e.g., suppression) phases. Antecedent-focused strategies are considered to be more effective in the regulation of affect than response-focused strategies because the former are implemented before or during emotional activation rather than after the emotion has achieved full form (e.g., Butler et al., 2003; Goldin, McRae, Ramel, & Gross,

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2007; Gross, 1998a; Richards & Gross, 2000). In parallel with this basic research approach, work on emotion regulation strategies in psychopathology has led to a differentiation between adaptive and maladaptive strategies on the basis of their relationships with symptoms (for a review, see Aldao, Nolen-Hoeksema, & Schweizer, 2010). Putatively adaptive strategies, such as acceptance, reappraisal, and problem solving, have shown negative associations with psychopathology. Conversely, putatively maladaptive strategies, such as avoidance, suppression, worry, and rumination, have been positively associated with symptoms of psychological disorders.

Despite this seemingly clear differentiation between antecedent-focused/adaptive and response-focused/maladaptive strategies, there are many instances in which the former can produce deleterious effects and the latter can facilitate beneficial outcomes. For example, implementing cognitive reappraisal (i.e., antecedent-focused/adaptive) to reduce the anger felt at a partner when he or she did not come home in time for dinner could be quite beneficial if the partner was late because of a traffic jam (i.e., circumstances outside of one's control); however, this strategy would be detrimental if it led to discounting (solid) evidence that the partner might be having an affair with a coworker. In the words of Gross, "inflexible or unrealistic reappraisals might lead one to deny important features of one's environment, such as hazards at work or abusive tendencies in a partner" (Gross, 1998a, p. 232). Recent empirical investigations support this notion. In one study consisting of a social interactive task, participants instructed to reappraise their emotions accepted more unfair offers than participants told to suppress their emotions and those given no specific regulation instructions (van't Wout, Chang, & Sanfey, 2011). In this particular context, reappraisal paved the way for a detrimental outcome. As Gratz and Roemer (2004) stated, "knowledge of the specific emotion regulation strategies used by an individual, in the absence of information on the context in which they are used, may provide little information about the individual's ability to regulate her or his emotions effectively" (p. 42). This suggests that a closer delineation of the contextual factors influencing emotion regulation will allow us to develop a more nuanced understanding of the conditions under which this process can lead to adaptive versus maladaptive outcomes.

Indeed, the relationship between a person and his or her context is particularly important in research on emotion regulation in psychopathology because psychological disorders are characterized by a rigid and inflexible pattern of responses to the environment (e.g., Buss, 2011; Cheng, 2001; Davidson, Jackson, & Kalin, 2000; Grillon, 2002; Hayes, Strosahl, & Wilson, 1999; Kashdan & Rottenberg, 2010; Rottenberg, Gross, & Gotlib, 2005). Such research has suggested that people who suffer from psychological disorders tend to encounter more difficulties regulating their emotions than healthy individuals (for reviews, see Aldao et al., 2010; Kring & Sloan, 2010). However, much remains to be understood about the mechanisms by which such dysregulation occurs and is reinforced. Closer inspection of the literature reveals that it is characterized by inconsistent findings. For example, the emotion regulation strategy of acceptance has been shown to produce both downregulation (e.g., Levitt, Brown, Orsillo, & Barlow, 2004) and maintenance (e.g., Aldao & Mennin, 2012) of negative affect in anxious participants in laboratory paradigms. Such mixed findings are likely the result of an approach to the study of psychopathology that has largely incorporated the experimental paradigms from the basic literature in their original form, without seeking to model the impact of context on the use and effects of emotion regulation strategies in individuals with psychological disorders.[1]

It is therefore clear that context plays a central role in the process of emotion regulation.[2] However, this recognition of the importance of context has appeared primarily in conceptual and theoretical realms, with empirical work lagging behind. This is likely because the field of emotion regulation is in its infancy and there are difficulties operationalizing such an evasive construct as context, which has been defined by *Merriam-Webster* as "the interrelated conditions in which something occurs or exists" ("Context," n.d.). This suggests that context includes all the circumstances that surround a given process. It is defined in relative, not absolute terms. So how can we operationalize context in a way that is both conceptually meaningful and empirically feasible?

One approach is to specify the components that characterize the process of emotion regulation and then to systematically evaluate deviations within each of these components. Such deviations constitute the contextual variability surrounding emotion regulation. In this way, context is operationalized in relative terms. Current conceptualizations of emotion regulation stipulate that this process takes place when organisms interact with their environment and experience affect, which, in turn, they seek to regulate in order to produce desired responses to the environmental challenges and demands (Gross, 1998b; Koole, 2009; Thompson, 1994). Therefore, I propose that the process of emotion regulation can be characterized by the following components: (a) the organism carrying out the regulation; (b) the emotion-eliciting stimuli in the environment; (c) the selection and implementation of strategies; and (d) the types of outcomes considered.

Each of these components consists of multiple dimensions that can be systematically varied to assess context. Of note, the number of dimensions is potentially infinite; this review is intended as a starting point in a new phase in the study of emotion regulation. The dimensions described below have been selected because they have been the focus of theoretical and empirical work, yet their variation has not been systematically evaluated in a way that could have allowed researchers to capture substantial contextual variability. Table 1 presents the contextual dimensions organized on the basis of the components of emotion regulation that they influence to a greater extent. The characteristics of organisms include dimensions such as demographics (e.g., age, gender, ethnicity), personality facets, dispositional psychological processes (e.g., working

Table 1. Components of Emotion Regulation and Their Underlying Dimensions

Organism carrying out the regulation	Emotion-eliciting stimuli	Selection and implementation	Types of outcomes assessed
Demographics	Ecological validity	Instructions	Emotional domain
Personality facets	Interpersonal processes	Spontaneity	Hedonic vs. instrumental
Psychological processes		Automaticity	Short- vs. long-term
Psychopathology		Implementation	
		Number of strategies	
		Relationship among strategies	

memory, attentional flexibility, use of regulation strategies), state-dependent psychological processes (e.g., mood, ego depletion, cognitive load), and psychopathology. As I will discuss later, despite the recent interest in research on emotion regulation in psychopathology, the vast majority of the empirical investigations have examined emotion regulation processes in healthy participants, whereas relatively little attention has been devoted to how those processes might differ as a function of variability in psychopathology status. Similarly, little interest has been paid to variability in personality facets and dispositional and state-level psychological processes. Two dimensions that influence the emotion-eliciting stimuli include the ecological validity of the stimuli and the presence of interpersonal processes. However, variability in these dimensions has been largely ignored. Indeed, a vast majority of empirical studies have relied on standardized film clips or pictures for the elicitation of affect (e.g., Gross & Levenson, 1995; Rottenberg, Ray, & Gross, 2007; International Affective Picture System: Lang, Bradley, & Cuthbert, 2008), and a much smaller number of investigations have consisted of interactive tasks, such as giving impromptu speeches (e.g., Hofmann, Heering, Sawyer, & Asnaani, 2009) or doing Co_2 challenges (e.g., Levitt et al., 2004).[3]

Dimensions influencing how individuals select and implement strategies include the type of instructions provided, the spontaneity (i.e., regardless of instructions) and automaticity of selection, the tactics used during implementation, the number of strategies compared, and the relationship among strategies in the repertoire. As I will review shortly, most experimental designs have provided participants with instructions to use specific emotion regulation strategies (usually one or two) and then assessed the extent to which participants were able to follow such instructions. The types of outcome considered include differential effects on each emotional domain (e.g., subjective, physiological, behavioral), hedonic versus instrumental goals, and short- versus long-term effects on affect and behavior. In this respect, the field has largely focused on the evaluation of hedonic short-term goals (see Tamir, Mitchell, & Gross, 2008, for a review of instrumental goals).

Under this proposed approach, investigators would evaluate contextual variability by assessing certain dimensions as they systematically vary other dimensions of the same or other components. Such an approach differs from the one adopted in the extant literature because, as I shall review shortly, studies have largely focused on examining one—or two—dimensions of interest at a time (e.g., instructing participants to use one strategy versus another one) while holding most other dimensions constant. For example, according to this suggested approach, one investigation might examine the effects of instructed and spontaneous implementation of reappraisal and acceptance on negative affect in participants with social anxiety, those with binge eating disorder, and healthy controls in response to eating in front of other people. In this case, contextual variability would pertain to some characteristics of the individual (i.e., psychopathology group) and aspects of the selection and implementation of strategies (i.e., comparison of instructed versus spontaneous selection; acceptance versus reappraisal). Fixed dimensions would entail the characteristics of the emotion-eliciting stimuli (i.e., eating in front of others) and the types of outcomes assessed (i.e., short-term negative affect). With this investigation, one could test whether reappraisal and acceptance might be implemented differently by individuals with two distinct disorders. One could also evaluate whether receiving specific instructions on how to regulate might impact the way in which strategies are implemented. Moreover, this might vary as a function of the strategy examined. With a larger sample, one could test interactions between these dimensions and examine, for example, whether participants with one disorder might benefit from the regulation instructions more than those with the other disorder.

In all, the possibilities for combinations of which components and their dimensions to hold constant and which to manipulate are endless. Thus, the choice of combinations should be informed by theoretical considerations and constrained by methodological limitations. For example, researchers in social and cognitive psychology might choose to focus on normative processes in healthy individuals by holding the dimension pertaining to psychopathology constant. Conversely, in order to conduct comparative work between pathological and normative samples, psychopathology researchers would need to incorporate variability in the psychopathology dimension.

In the next section, I discuss each component by describing their underlying dimensions, and I provide suggestions for manipulations that will facilitate the study of variability at the level of dimensions and components. Following that, I provide initial guidelines for how to combine such dimensions and

components in order to capture substantial and meaningful contextual influences. When possible, I incorporate clinical examples because context is more broadly defined in the study of psychopathology (i.e., by definition, one has to model the psychopathology dimension). This does not mean that the examples and recommendations presented in this review do not pertain to the basic work on emotion regulation; indeed, each time the psychopathology dimension is held constant at "healthy individuals," such research pertains to normative functioning. Of note, this proposed approach is not intended to be the final word on context and emotion regulation; rather, it is expected to be merely a starting point in the next phase in the study of emotion regulation, a phase characterized by successive iterations of theoretical and empirical work that will lead to the development of a more sophisticated yet parsimonious understanding of the interplay between context and emotion regulation.

Assessing Variability in Contextual Components and Their Underlying Dimensions

Organism carrying out the regulation

How are demographic characteristics, personality facets, and psychological processes examined? Several investigations over the past decade have examined the moderating effects of various demographic characteristics (e.g., age, gender, ethnicity, life stressors), personality facets (e.g., neuroticism), and dispositional and state-level psychological processes (e.g., trait affect, habitual use of strategies, mood) on the regulatory process. These include correlational (e.g., John & Gross, 2004; Kokkonen & Pulkkinen, 2001; Nolen-Hoeksema & Aldao, 2011; Soto, Perez, Kim, Lee, & Minnick, 2011; Zlomke & Hahn, 2010) as well as experimental studies (e.g., age: Larcom & Isaacowitz, 2009; McRae, Ciesielski, & Gross, 2011; Winecoff, LaBar, Madden, Cabeza, & Huettel, 2010; gender: McRae, Ochsner, Mauss, Gabrieli, & Gross, 2008; ethnicity: Gross & John, 2003; Roberts, Levenson, & Gross, 2008; trait affect: Dalgleish, Yiend, Schweizer, & Dunn, 2009; life stressors: O'Mara, McNulty, & Karney, 2011; Shallcross, Troy, Boland, & Mauss, 2010; and habitual use of emotion regulation strategies: Burns, Quartana, & Bruehl, 2007; Geraerts, Merckelbach, Jelicic, & Smeets, 2006; Gilliam et al., 2010; Ray et al., 2005; Wolgast, Lundh, & Viborg, 2011). However, most of these investigations have examined only one or two person-level characteristics at a time, therefore falling short of modeling the complex interactions among the various aspects of demographic characteristics, personality facets, and psychological processes. Moreover, the number of studies examining the same person-level characteristics is quite small, which has limited the scope of between-studies comparisons.

To address this limitation, it will first be important to recruit samples that are large enough to have sufficient power for the simultaneous examination of multiple person-level variables. Because there might be a practical limitation to how many individuals can participate in a laboratory-based assessment (relative to survey studies), it will be essential to ensure that there is a sufficient number of participants at each level of the moderator variable. This can be achieved by oversampling for those characteristics that have a low base rate in the population. Second, it will be critical to test the interactions among person-level characteristics. In this respect, a recent study showed that the habitual implementation of certain regulation strategies was a function of the interaction between age and gender (Nolen-Hoeksema & Aldao, 2011). For example, older women reported using suppression to a greater extent than did young and middle-age women, and there were no age differences within men. These findings underscore the necessity to simultaneously use multiple dimensions to characterize individuals and their regulation repertoire. Third, it will be particularly important to adopt a developmental approach to comprehensively model changes over time in children (e.g., Cicchetti, Ackerman, & Izard, 1995; Cole, Martin, & Dennis, 2004) and older adults (e.g., Isaacowitz & Blanchard-Fields, 2012).

How is psychopathology assessed? Many of the early studies on emotion regulation in psychopathology included one clinical group and omitted a comparison group of healthy controls (e.g., Borkovec & Hu, 1990; Borkovec, Lyonfields, Wiser, & Deihl, 1993; Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Levitt et al., 2004; Liverant, Brown, Barlow, & Roemer, 2008). Needless to say, this constituted a major limitation that prevented the identification of the pathological processes in emotion regulation in psychopathology. Fortunately, more recent investigations have included a control group. However, they have mostly examined only one psychopathology group, which has precluded the differentiation of disorder-specific versus transdiagnostic deficits (Harvey, Watkins, Mansell, & Shafran, 2004). Examples include reappraisal in depression (e.g., Johnstone, van Reekum, Urry, Kalin, & Davidson, 2007), anxiety (e.g., Campbell-Sills et al., 2011), and borderline personality disorder (e.g., Schulze et al., 2011); suppression in depression (e.g., Dalgleish & Yiend, 2006) and anxiety (e.g., Kingsep & Page, 2010); suppression and reappraisal in binge eating disorder (e.g., Svaldi, Caffier, & Tuschen-Caffier, 2010); and acceptance and reappraisal in anxiety (e.g., Aldao & Mennin, 2012). The lack of multiple pathological groups is an issue that transcends the study of emotion regulation, as it applies to most studies of psychological processes that include only one psychopathology group. However, given arguments that emotion regulation is a transdiagnostic factor (e.g., Aldao & Nolen-Hoeksema, 2010; Kring & Sloan, 2010), it is particularly important that investigators conduct the type of studies that will allow for the identification of which emotion regulation deficits are broad markers of psychopathology and which are specific to the particular phenomenology of individual disorders. As a related

point, a vast majority of the laboratory-based studies have been primarily conducted on anxiety and mood disorders, further limiting our understanding of emotion regulation across disorders (for a review of a similar asymmetry in correlational studies, see Aldao et al., 2010).

The most evident solution to the issues delineated above is the inclusion of more than one psychopathology group. However, this poses a series of additional complications: (a) the need for larger samples that meet specific inclusion and exclusion criteria and (b) the difficulties modeling comorbidity between discrete clinical groups. For example, in a study that includes two psychopathology groups (diagnoses of social anxiety disorder and major depressive disorder, respectively), what is the best way to categorize those participants who have both diagnoses? Excluding such participants altogether would limit the external validity of the investigation; conversely, creating a separate "comorbid" group might obscure between-group differences. This point resonates with the recent interest in dimensional models of psychopathology (e.g., Clark, 2005; Cuthbert, 2005; Krueger, Markon, Patrick, & Iacono, 2005; Watson, 2005; Widiger & Samuel, 2005; see Research Domain Criteria: Insel et al., 2010). Therefore, a necessary next step in the study of emotion regulation in psychopathology will involve the dimensional measurement of symptoms (e.g., self-report questionnaires; diagnostic interviews such as the Anxiety Disorders Interview Schedule, which includes a dimensional scoring system; DiNardo, Brown, & Barlow, 1994). From a statistical standpoint, the use of structural equation modeling (Arbuckle, 2007) could provide an advantage over the more commonly used linear regression, as it would offer different options to model covariance structures among symptoms of disorders that have high diagnostic overlap (e.g., covariance among error terms, latent factors).

Emotion-eliciting stimuli

What is the ecological and external validity of the emotion-eliciting stimuli and the paradigms? Although a good number of the emotion-eliciting stimuli have been shown to reliably elicit emotion and, in many cases, have even been standardized (e.g., pictures: Lang et al., 2008; film clips: Gross & Levenson, 1995; Rottenberg et al., 2007), their use has led to limitations in the external and ecological validity of the experimental manipulations. This is particularly the case for those stimuli that result in a relatively passive viewing by participants, as they induce a state that could be conceptualized as the opposite of the active engagement with the environment that emotions are believed to facilitate (e.g., Frijda, 1986). Indeed, watching television could be described as a behavior serving an avoidant function in certain contexts (Endler & Parker, 1990), and it is common to hear from patients that they sit in front of the television for hours in order to escape the experience of difficult emotions.

Relatedly, only a handful of investigations have measured the implementation of strategies in response to naturally occurring stimuli via the use of ecological momentary assessments (EMA; e.g., Moberly & Watkins, 2008; Shahar & Herr, 2011; Silk, Steinberg, & Morris, 2003). Such naturalistic interactions are particularly informative in the context of psychopathology because they can allow researchers to identify the extent to which regulation follows the same patterns of rigidity as the emotional experiences (e.g., Rottenberg et al., 2005). For example, an individual who suffers from social anxiety disorder in the context of dating situations might be able to perform relatively well in a laboratory paradigm consisting of an impromptu speech, a frequent manipulation used to elicit fears of negative evaluation (e.g., Beidel, Turner, Jacob, & Cooley, 1989). Conversely, examining the day-to-day interactions of this individual with peers and potential romantic partners might provide investigators with a much richer picture of his or her pattern of emotion dysregulation.

It will be important that the field reconsiders the selection of emotion-eliciting stimuli to favor those that produce more complex emotional and motivational states that are idiographically relevant and can therefore enhance the external and ecological validity of the experimental approach. One such example is the presentation of film clips in which participants themselves are discussing emotional topics (e.g., Rottenberg et al., 2005). However, as discussed previously, there is an ingrained passivity in the watching of stimuli that likely dampens the extent to which they elicit motivational engagement. Therefore, it will be important for idiographic stimuli to stimulate motivational states by requiring active engagement from participants. One example of such stimuli consists of worry and rumination inductions in which participants are guided to engage in worry and ruminative processes (e.g., Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). In addition, a relatively small number of studies have examined emotion regulation strategies in relation to goal-oriented tasks, such as playing video games (e.g., Tamir et al., 2008), writing emotionally evocative personal stories (e.g., Dalgleish et al., 2009), and tolerating distress (e.g., Feldner, Zvolensky, Eifert, & Spira, 2003; Szasz, Szentagotai, & Hofmann, 2011). Such paradigms have been used largely with normative samples; therefore, an important next step will be the use of these paradigms in studies with participants who experience clinical levels of psychopathology. A related point that might allow researchers to better capture contextual variability is the modeling of stimuli as random rather than fixed factors (for a comprehensive review of this issue, see Judd, Westfall, & Kenny, 2012).

In addition, it will be important to increase the variability of the settings in which the assessments take place by using EMA designs. In addition, it will be informative to experimentally induce the implementation of regulation strategies via EMA. Such an approach could be extremely useful in helping researchers to teach participants how to implement strategies online and might eventually result in the development of trainings that could be used as stand-alone interventions or as augmentations for traditional psychotherapeutic approaches.

What about the interpersonal context? One of the most important contextual factors that influence human behavior is the presence of other individuals. The process of emotion regulation is no exception to this rule. From a crying toddler seeking a parent's hug to an adult requesting advice from a friend, people constantly rely on others for the regulation of their affective states (e.g., Coan, Schaefer, & Davidson, 2006; Lakey & Orehek, 2011; Marroquín, 2011; Rime, 2009). Similarly, the interpersonal context constitutes one of the main spheres of dysfunction across psychological disorders (e.g., Cain et al., 2011; Erickson & Newman, 2007; Joiner, Van Orden, Witte, Selby, & Rudd, 2009; Linehan, 1993; Lynch, Trost, Salsman, & Linehan, 2007; Marroquín, 2011). Therefore, such interpersonal processes are vital to the understanding of the deficits in emotion regulation that characterize psychopathology. However, the empirical work is still in its infancy, and much remains to be understood about the basic and pathological mechanisms by which interpersonal regulation takes place. One exception is the process of co-rumination, conceptualized as the tendency to excessively discuss problems within a relationship (e.g., Rose, Carlson, & Waller, 2007). Yet, this process has been examined in only a handful of studies, and much remains to be understood regarding its relationship to various forms of psychopathology and to the implementation of other emotion regulation strategies.

Given the scarcity of experimental paradigms that systematically model interpersonal processes, a first step toward a solution will consist of functional analyses of interactions between the participant and other participants and/or confederates. For example, when participants are having difficulties implementing a strategy to manage their anxiety, do they reach out to the other participant? If so, do they seek distraction or validation? In this respect, the literature on emotion regulation in psychopathology has much to learn from the dyadic studies that are so central to the developmental literature (see Cole et al., 2004; Eisenberg, Spinrad, & Eggum, 2010). Second, it will be important to expand on the operationalization of the strategies to incorporate joint processes, similarly to the case of co-rumination. For example, it would be useful to operationalize co-avoidance or co-reappraisal. Third, the use of EMA methodologies would allow researchers to assess naturalistic interpersonal processes that are both elicitors and regulators of emotion. A fourth suggestion involves matching the nature of the interpersonal scenario to those that are particularly problematic within the context of specific disorders, such as an interpersonal conflict script in borderline personality disorder (Suvak et al., 2012).

Selection and implementation

How are participants instructed to regulate? There is substantial variability in the operationalization of emotion regulation strategies. This issue is perhaps best illustrated in the case of suppression, which encompasses activity in various domains: facial expressions (e.g., Gross, 1998a), internal experiences (e.g., Jackson, Malmstadt, Larson, & Davidson, 2000), or thoughts (e.g., Wenzlaff & Wegner, 2000). For example, some investigators have defined experiential suppression broadly (e.g., "please try your best to push these emotions away so that you do not feel them. Do your best to remain neutral during the film"; Tull, Jakupcak, & Roemer, 2010, p. 119). Others have equated it with thought suppression (e.g., "do not think about any of your feelings at all; push them out of your mind"; Quartana & Burns, 2007, p. 404). Still others have combined it with expressive suppression (e.g., "[do] not let your feelings take over or get out of control. In fact, you should try to behave in a way in which others, if they were in the room, would have no idea of how and what you are feeling"; Leen-Feldner, Zvolensky, & Feldner, 2004, p. 787). Recent work has also pointed out the heterogeneity of ways in which people engage in cognitive reappraisal (McRae et al., 2011). Needless to say, such variability interferes with the ability to make cross-study comparisons. This is particularly problematic in the context of psychopathology for two reasons. First, the emotional disturbances seen in psychiatric disorders are highly variable from one disorder to the next (e.g., positive affect is blunted in depression and social anxiety, elevated in mania, and within normal ranges in most anxiety disorders; Brown, 2007; Gruber, Harvey, & Gross, 2012). Second, people suffering from psychological disorders have been shown to have difficulties identifying their emotional states and their attempts at regulation of such states (e.g., Declercq, Vanheule, & Deheegher, 2010; Flynn & Rudolph, 2010; Gratz & Roemer, 2004; Marchesi, Brusamonti, & Maggini, 2000; Mennin, Holaway, Fresco, Moore, & Heimberg, 2007). Therefore, it is possible that individuals with psychopathology might show higher variability in their methods of implementing a given strategy (e.g., worry; Roemer, Molina, & Borkovec, 1997) or might confuse the strategies (e.g., by thinking they are problem solving when they are actually worrying and ruminating; Borkovec & Roemer, 1995; Nolen-Hoeksema et al., 2008; Wells, 2005).

The first step in addressing the heterogeneity in the operationalization of strategies consists of the development of a standardized coding scheme to functionally classify regulation instructions. Some of the proposed dimensions to code in such a system include whether instructions (a) pertain to activity in subjective, behavioral (i.e., expressive), and/or physiological domains; (b) provide examples on how to use the target strategy; (c) specifically instruct against the use of other strategies; and (d) include a practice period (and, if so, how long). Using these dimensions would facilitate cross-study comparisons and would allow for a thorough evaluation of the relationship between the type of strategy the investigators intended to induce and how participants actually implemented it. This could be examined via a meta-analytic review of the published data (although such a review would require a substantial degree of cooperation from the authors, given that a good part of this information is not available in published reports). It could also be approached by developing a series of guidelines

for future investigations. A common language in the study of such complex phenomena as emotions is certainly an important step in the growth of the field over the next decade.

What do we know about spontaneous regulation? The majority of experimental studies on emotion regulation have instructed participants to implement strategies, instead of assessing which strategies individuals implement spontaneously (cf. Egloff, Schmukle, Burns, & Schwerdtfeger, 2006; Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010; Gruber et al., 2012; Sheppes, Scheibe, Suri, & Gross, 2011). This omission has been problematic because it has interfered with the development of an understanding of the mechanisms by which individuals naturally select strategies. Indeed, the handful of studies assessing spontaneous selection (Egloff et al., 2006; Sheppes, Scheibe, Suri, & Gross, 2011; in psychopathology, Ehring et al., 2010; Gruber et al., 2012) has produced interesting findings that underscore the importance of such an approach. For example, Sheppes and colleagues have found that the spontaneous implementation of certain strategies can be a function of varying contextual demands, such that healthy participants use reappraisal in situations that elicit low emotional intensity and distraction when situations are high in affective intensity.

The assessment of spontaneously selected strategies need not be at odds with the use of paradigms in which participants are instructed to implement certain strategies. Indeed, valuable information could be obtained regarding the process by which participants deviate from their instructions, as this would mimic situations frequently encountered in psychotherapeutic settings when patients have difficulties carrying out homework assignments that consist of practicing regulation strategies at home (e.g., Mennin & Fresco, 2010; Roemer, Orsillo, & Salters-Pedneault, 2008). Measuring the spontaneous implementation of strategies can be easily achieved by incorporating questions that ask about the implementation of additional, noninstructed, strategies to the manipulation checks. Moreover, such manipulation checks could also incorporate a temporal dimension, by asking about (a) the order in which different strategies were implemented and (b) the amount of time an individual spent on a strategy before moving onto the next one. In order to reduce the demand characteristics of such manipulation checks, participants could be asked open-ended questions in which they are prompted to describe the ways in which they sought to regulate their emotions. Although these reports might still be influenced by reporting biases, it has been shown that when individuals report on their affect within 2 hr, such reports tend to be based on episodic or experiential knowledge, which is less susceptible to biases than semantic memory (Robinson & Clore, 2002). Another option that might allow investigators to minimize reporting biases would consist of asking participants to provide online ratings of the extent to which they are using each regulation strategy via the use of affect rating dials (see Ruef & Levenson, 2007). However, by doing so, investigators might increase participants' cognitive load, which, in turn, might interfere with the ability to carry out the regulation effort (e.g., Wegner, Erber, & Zanakos, 1993)—and/or to report on it.[4] In addition, researchers risk priming participants to use certain strategies. Given that each of these approaches poses a potential limitation, the choice of which one to use should follow the theoretical considerations of a given investigation.

In terms of quantifying responses, I propose the calculation of several scores that could help capture the complex relationship among strategies in the emotion regulation repertoire: (a) *specificity of target strategy*, calculated as either the number of additional strategies used (by dichotomizing use of each strategy) or as the difference score between the use of the target strategy and the average of the other strategies; (b) *regulatory effort*, computed as the average use of all strategies; (c) *flexibility*, calculated as the number of times participants switch strategies (for additional scores, see Bonanno, Pat-Horenczyk, & Noll, 2011); (d) *perseveration*, computed as the continued use of a strategy when it is not producing desired effects; and (e) *repetition*, calculated as the extent to which participants go back to previously abandoned strategies. These proposed scores constitute a starting point that I hope will influence the development of a more complex approach to the assessment of spontaneous emotion regulation.

Can regulation be automatic? A related issue pertains to the overreliance on study designs that manipulate and assess the conscious implementation of emotion regulation strategies and therefore ignore automatic or implicit processes. This is problematic because, although emotion regulation has been largely conceptualized as a conscious process (Gross, 1998b), there is a growing theoretical literature (Bargh & Williams, 2007; Gyurak, Gross, & Etkin, 2011; Koole & Rothermund, 2011) and empirical evidence from normative samples (e.g., Jostmann, Karremans, & Finkenauer, 2011; Mauss, Cook, & Gross, 2007; Mikulincer, Shaver, & Rom, 2011; Quirin, Bode, & Kuhl, 2011; Williams, Bargh, Nocera, & Gray, 2009) demonstrating the importance of studying emotion regulation at the automatic or implicit level. Indeed, this issue is particularly relevant to clinical disorders, as pathological states are characterized by disconnects between an individual's experience and his or her conscious interpretation it (e.g., Barlow, 2002; Beck, 1976; Freud, 1920/1966). For example, difficulties identifying and labeling emotional states (e.g., Bagby, Parker, & Taylor, 1994; Mayer, Salovey, & Caruso, 2004) have been associated with a wide range of disorders (e.g., Declercq et al., 2010; Flynn & Rudolph, 2010; Gratz & Roemer, 2004; Marchesi et al., 2000; Mennin et al., 2007). Therefore, the systematic evaluation of automatic or implicit emotion regulation has the potential to shed light onto core processes of psychopathology.

The majority of the empirical studies on automatic emotion regulation have been conducted in normative populations, so the first step toward a solution will consist of evaluating such manipulations in clinical samples. A second step will consist of the examination of interactions between conscious and

unconscious regulation. For example, in a normative sample, Williams and colleagues (2009) showed that the effects of nonconscious reappraisal were more pronounced in those individuals who did not habitually use reappraisal. Given that individuals with psychopathology tend to have difficulties using this strategy (see Aldao et al., 2010), evaluating the extent to which they could implement it in an automatic or implicit way could have important clinical implications. Third, it will be useful to develop experimental designs to examine how the conscious implementation of strategies becomes automatic and ingrained in the repertoire of strategies over time. For example, researchers could design paradigms including multiple follow-up periods and laboratory visits as well as take advantage of EMA methodology. Such an approach would allow the field to answer important theoretical questions and inform clinical practice. For example, what is the average number of times an individual needs to consciously practice implementing acceptance until it starts becoming "second nature"? Relatedly, how does the automatization of a certain strategy affect the conscious and unconscious implementation of other strategies?

How are participants actually regulating? A related issue pertains to how participants actually implement the instructed (or spontaneous, for that matter) strategies. As mentioned earlier, investigators typically administer a series of questions at the end of the experiment asking participants to rate the extent to which they used certain strategies to regulate their affect. Not surprisingly, participants tend to rate themselves as implementing the strategy they were asked to use to a greater extent than any other strategies (e.g., Campbell-Sills et al., 2006; Wolgast et al., 2011), which is problematic because it is likely that demand characteristics play a role in how these ratings are provided. This issue is, of course, not exclusive to empirical research on emotion regulation; rather, it reflects the complex methodological problems surrounding manipulation checks in experimental studies, which is beyond the scope of this review. Nonetheless, an overly simplistic approach to manipulation checks poses a substantial methodological shortcoming given that individuals likely implement the same strategy via the use of a wide range of tactics (e.g., McRae et al., 2011). This problem is particularly accentuated in the case of clinical populations, because, as described earlier, individuals with psychological disorders might show higher variability in their methods of implementing a given strategy or might confuse strategies.

One way of reducing the demand characteristics of the manipulation checks is to ask participants open-ended questions about the ways in which they sought to regulate their emotions. Such an approach would force participants to generate responses and therefore reduce the likelihood that they might just endorse a high number on the strategy that they were required to implement. In addition, this approach would have the added benefit of allowing researchers to quantify the extent to which participants diverged from the intended regulation strategy and thus allow for more fine-grained analyses of their data (see McRae et al., 2011). Relatedly, it would provide investigators with the opportunity of capturing regulatory flexibility at two levels in tandem: strategies and their tactics. For example, investigators could assess whether individuals tend to implement a given strategy with the same set of tactics across situations or whether these individuals can modulate the selection of tactics on the basis of contextual demands. In addition, given the work by Sheppes and colleagues showing that when reappraisal is implemented in a response-focused fashion it leads to deleterious outcomes, such as elevated sympathetic activation (Sheppes, Catran, & Meiran, 2009) and increased expenditure of self-control resources (Sheppes & Meiran, 2008), it will be important to assess the point in time, relative to the elicitation of the affective state, in which the strategies are implemented. Lastly, given that individuals, particularly those with psychopathology, might have difficulties providing reliable reports of their regulation process, it might be useful to administer manipulation checks that assess implicit or automatic emotion regulation (see Koole & Rothermond, 2011).

How many strategies are being compared? Empirical examinations have largely consisted of comparisons between only one or two strategies (cf. Hofmann et al., 2009, and Szasz et al., 2011, who examined three strategies). Therefore, much of our knowledge of the effects of strategies is relative to the other strategy with which they are compared and does not reflect the complexities of the emotion regulation repertoire. This problem is particularly exacerbated by the fact that there is an asymmetry in the number of studies conducting certain comparisons that further limits the scope of the approach. For example, a strategy such as reappraisal is much more frequently compared with expressive suppression (e.g., Butler et al., 2003; Denson, Grisham, & Moulds, 2011; Dillon, Ritchey, Johnson, & LaBar, 2007; Goldin et al., 2007; Gross, 1998a; Ochsner, Bunge, Gross, & Gabrieli, 2002; Richards & Gross, 2000) than with acceptance (e.g., Aldao & Mennin, 2012; Hofmann et al., 2009; Szasz et al., 2011; Wolgast et al., 2011).

To address this limitation, it will be important to increase the number of strategies compared with one another within each experimental session. This is important because it will allow researchers to delineate the effects of Strategy X not only with respect to Strategy Y but also in relation to a wider set of strategies, which would result in a richer delineation of the functional role of each strategy. In addition, in the experimental psychopathology literature, the inclusion of only one strategy does not allow investigators to draw conclusions regarding whether the deficits observed pertain to the implementation of a particular strategy or to broader deficits in the implementation of any strategy. Relatedly, a more frequent utilization of within-subjects designs would yield important additional information, as this would allow researchers to measure participants' ability to flexibly implement various strategies. This is particularly important, because the ability to flexibly switch from one strategy to another (e.g., suppressing

and enhancing facial expressions) has been associated with low levels of psychopathology (e.g., Bonanno, Papa, O'Neill, Westphal, & Coifman, 2004; Gupta & Bonanno, 2011; Westphal, Seivert, & Bonanno, 2011), and psychological flexibility is a key component of current therapeutic approaches, particularly acceptance and commitment therapy (e.g., Hayes et al., 1999), mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002), dialectical behavior therapy (Linehan, 1993), emotion regulation therapy (Mennin & Fresco, 2010), and acceptance-based behavioral therapy (Roemer et al., 2008). However, it is also the case that using within-subjects designs in the elicitation of affect might lead to spillover effects that contaminate the subsequent manipulation. Investigators are then encouraged to counterbalance the order and use precise measurements to assess the presence of such effects. For instance, it would be interesting to assess subsequent implicit mood and regulation tendencies (see Koole & Rothermund, 2011). Moreover, it would be useful to seek to model such effects as delayed regulation effects (see *What is the time frame of effects?* below).

What is the relationship among strategies in the repertoire? Another example of omission of contextual factors pertains to the relatively nonexistent examination of the interaction among strategies. This omission is problematic because individuals possess an emotion regulation repertoire in which the selection of strategies likely influences the selection and effects (or lack thereof) of others. For example, in one study, participants instructed to suppress the facial expression of emotions elicited by a film clip were more likely to also use a cognitive strategy than those instructed to exaggerate their responses; moreover, the implementation of cognitive strategies in the context of suppression led to reductions in negative affect (Demaree, Robinson, Pu, & Allen, 2006). Similarly, in another study, participants failing to reduce aversive emotion by using reappraisal were more likely to engage in avoidance (Wolgast et al., 2011). However, both studies examined healthy participants, therefore limiting the clinical implications of their findings. From an experimental psychopathology perspective, Bonanno and colleagues have produced an extensive line of work examining flexibility in alternating between facial expressions and suppression and have identified such flexibility as a marker of psychological health (i.e., negative associations with psychopathology; Bonanno et al., 2004; Coifman & Bonanno, 2010; Gupta & Bonanno, 2011; Westphal et al., 2010). However, this work has focused on the regulation of facial expressions rather than on that of internal experiences. A more recent survey study examining a wider range of regulation strategies showed that the habitual use of adaptive strategies interacts with that of maladaptive strategies in the prediction of psychopathology, such that only those individuals who endorse using high (but not low) levels of maladaptive strategies display the expected negative association between adaptive strategies and symptoms (Aldao & Nolen-Hoeksema, 2012b). However, this study is correlational, which prevents us from drawing causal inferences. Beyond these investigations, the empirical examination of the complex interactions among strategies has been scarce, and therefore little is known about the processes by which individuals with psychopathology develop and maintain rigid patterns of dysregulation (e.g., Aldao et al., 2010; Kring & Sloan, 2010). This issue is particularly relevant for those treatment approaches that focus on the teaching of flexibility in the implementation of regulatory strategies (e.g., Hayes et al., 1999; Linehan, 1993; Mennin & Fresco, 2010; Roemer et al., 2008; Segal et al., 2002).

It will be important to build on the interaction findings between trait-level strategies (Aldao & Nolen-Hoeksema, 2012b) by examining interactions at the state level and in relation to a wider range of outcomes. It will also be useful to evaluate whether the implementation of Strategy X at Time 1 is associated with an increase or a decrease in the probability of using Strategy X at Time 2 (or Strategy Y at Time 2). Researchers could examine the spillover effects of regulation on subsequent tasks in the laboratory as well as on naturalistic interactions with the environment (via delayed surveys or EMA designs). Relatedly, it will be useful to use longitudinal designs to measure the process by which strategies implemented sporadically become ingrained in the emotion regulation repertoire. Of particular interest will be to conduct such work within a developmental framework to delineate the process by which children and adolescents develop their repertoire as they become adults. A third question pertains to whether individuals can implement multiple strategies simultaneously or whether regulatory attempts can take place only sequentially. Two studies suggest that people can implement multiple strategies at once (Demaree et al., 2006; Wolgast et al., 2011). It will be important to examine whether this simultaneous implementation reflects regulatory flexibility or haphazard attempts at regulation. Examining this process in normative and healthy populations will constitute a first step in the evaluation of its functional adaptiveness. These and related questions have the potential to spur the development of experimental paradigms that will allow us to achieve a more thorough understanding of the patterns in the implementation of emotion regulation strategies and help identify processes that might break the vicious cycles that underlie the rigidity seen across clinical disorders.

Types of outcomes assessed

Are all emotional domains equally affected? Emotions are the result of activation in multiple domains, namely, the subjective, behavioral, and physiological (e.g., Bradley & Lang, 2000; Ekman, 1992). Of note, the physiological domain encompasses activity in both the peripheral and central nervous systems (e.g., affective neuroscience; Davidson et al., 2000; Ochsner & Gross, 2008). Despite this recognition of the

multifaceted nature of emotion, many questions remain unanswered. For example, we do not know how much activity in each domain is required for an emotion to take place. For example, if an individual is having an anxious thought, how much physiological reactivity is necessary (if any at all) for that thought to be considered part of an emotion? The answer to this question belongs to the field of philosophy and is, therefore, well beyond the scope of this review. However, I mention it here because it influences how we think about the effects of emotion regulation strategies. When people seek to regulate an emotion, they tend to use one domain to influence other domains. For example, when individuals implement reappraisal, they use the subjective domain (i.e., modify their thoughts) to reduce arousal in the physiological domain and produce a given behavioral response. Therefore, to fully examine the influence of regulation strategies on each domain, it is important that we develop a more complex approach to modeling the relationships among domains. To this date, a handful of investigations have sought such an endeavor by calculating the coherence (i.e., correlation) among domains during emotional reactivity (e.g., Mauss et al., 2007; Sze, Gyurak, Yuan, & Levenson, 2010). However, such an approach has not yet been implemented in relation to the regulation of such reactivity. This scarcity of studies is likely the result of the methodological (e.g., specialized equipment) and statistical (e.g., lagged correlations) challenges involving the continuous measurement of affect. Despite these complexities, identifying the processes that constitute a normative orchestrated response for a given strategy in a particular context might be extremely beneficial in delineating disruptions in regulation within the context of psychopathology.

Experimental investigations of emotion regulation usually include a baseline and, less frequently, a recovery period. Therefore, they consist of at least three discrete time points: baseline, stimulus presentation, and recovery. It is common practice to conduct repeated measures multivariate analyses of variance to predict activity at various time points. However, very little attention has been paid to an equally simple yet conceptually important type of analysis: whether activity in Domain X during the stimulus presentation predicts changes in Domain Y from stimulus presentation to recovery. Or, even more simply, it would be useful to calculate correlations among domains at each point in time and then statistically compare whether they are different from each other via the calculation of Fisher's *Z* coefficients. Conducting this type of analysis would constitute a critical first step in delineating the complex relationship between emotional domains during the regulatory process.

What constitutes a beneficial outcome? The emotion regulation literature has evaluated the adaptiveness of outcomes by focusing on hedonic goals, that is, the ability of strategies to (a) downregulate negative affect and/or (b) maintain or increase positive affect. It is not surprising that such a narrow conceptualization of the multifaceted transactions between the individual and his or her environment that ignores additional, nonhedonic, goals has resulted in mixed and puzzling findings. From the basic literature, one clear example is the comparison between the effects of acceptance and reappraisal, both putatively adaptive strategies. In one study examining regulation in response to emotions elicited by film clips, acceptance and reappraisal led to lower subjective distress, physiological activation, and behavioral avoidance than a no-instructions condition; however, for some of the film clips, reappraisal produced larger subjective and physiological effects than acceptance (Wolgast et al., 2011). Similarly, in another study, during an impromptu speech task, acceptance and reappraisal produced smaller increases in heart rate from baseline to speech task than the suppression condition (and did not differ from each other), yet reappraisal resulted in smaller increases in subjective anxiety than suppression, with acceptance falling nonsignificantly in between (Hofmann et al., 2009). Lastly, in an experiment consisting of a frustration task, reappraisal resulted in larger decreases in anger and greater behavioral persistence than did acceptance and experiential suppression (Szasz et al., 2011). Overall, these findings would suggest that reappraisal might be more beneficial for the regulation of subjective states than acceptance; however, such findings do not provide a clear picture regarding physiological states or behavior. More important, before making conclusive claims pertaining to the greater effectiveness of one strategy versus the other, it will be critical to integrate these findings within the purported function of each strategy. In other words, insofar as acceptance entails the allowance of affective states (e.g., Hayes et al., 1999), it is to be expected that it would lead to lower decreases in emotional experience than reappraisal (e.g., Aldao & Mennin, 2012). Indeed, in a study comparing acceptance with experiential suppression and a no-instructions condition, acceptance was found to result in ongoing emotional activation, whereas suppression led to downregulation of emotion (Dunn, Billotti, Murphy, & Dalgleish, 2009).

In the clinical literature, this issue is clearly exemplified in the demarcation of how much downregulation of affect is "sufficient." Two recent studies have shown that anxious children and adults seeking to downregulate negative affect achieved similar reductions as nonanxious controls (Campbell-Sills et al., 2011; Carthy, Horesh, Apter, Edge, & Gross, 2010). However, it is also the case that highly anxious individuals begin the regulation process at higher absolute levels of negative affect. In this respect, a comparable reduction to that achieved by controls might still leave the anxious individuals experiencing a substantial amount of negative affect. In other words, focusing on the slope of change alone, rather than in tandem with the intercepts, provides a limited grasp on the complex dynamics of regulation.

Recent theoretical work (Koole, 2009; for a philosophical discussion, see Charland, 2011) and a handful of empirical studies by Tamir and colleagues (e.g., Tamir & Ford, 2009; Tamir et al., 2008) have proposed to broaden the conceptualization of emotion regulation beyond hedonic goals to

incorporate idiographically relevant instrumental goals. For example, Tamir and colleagues (2008) have shown that when preparing to have a confrontation, participants preferred activities that increased anger. In other words, individuals were choosing to endure a difficult and unpleasant state in the present for the sake of a valued benefit in the future. This is reminiscent of the delayed gratification literature (Mischel, Shoda, & Rodriguez, 1989) and, to a lesser extent, of the work on distress tolerance (see Zvolensky, Bernstein, & Vujanovic, 2010). Relatedly, there has been a recent interest in identifying the paradoxical negative effects of positive affective states (e.g., Gruber, Mauss, & Tamir, 2011; Mauss, Tamir, Anderson, & Savino, 2011).

I propose a further delineation of regulation goals by incorporating an idiographic approach in which participants provide information regarding their motivation at baseline. For example, in an experimental manipulation consisting of a cold pressor in exchange for a certain amount of money, it will be useful to obtain information regarding participants' goals (e.g., how important it is to earn the money, how concerned they are about the water being almost freezing, how much they fear negative evaluation by the experimenters). Then, their performance on the task (e.g., latency to quit, reports of pain) could be evaluated within a richer idiographic and motivational context. However, the notion of relying on participants' idiographic description of what constitutes adaptive regulation should be evaluated with caution, particularly in the case of individuals experiencing elevated symptoms of psychopathology. As described above, most clinical disorders are characterized by patterns of rigidity and avoidance (e.g., Cheng, 2001; Davidson et al., 2000; Grillon, 2002; Hayes et al., 1999; Kashdan & Rottenberg, 2010; Rottenberg et al., 2005); therefore, individuals with psychopathology are likely to identify goals that serve an avoidant function. To address this potential catch-22, it will be important to use a multimethod approach to evaluate regulation outcomes across multiple domains and, ideally, over repeated instances. In this respect, investigators will be able to develop a more nuanced understanding of such patterns of rigidity and avoidance.

What is the time frame for effects? In addition to focusing on hedonic goals, most of the empirical investigations on emotion regulation have examined the immediate effects of regulation on affect and behavior, and relatively little attention has been devoted to long-term or spillover effects of a regulatory effort. This is particularly problematic because the outcome of a given regulation event likely influences the next event in which affect is generated and regulated. For example, if an individual is anxious about confronting his or her employees about something they did wrong and avoids them altogether, the person might experience an immediate reduction in anxiety. We would be tempted to call this regulation effort "successful." However, if the person then gets home and continues to worry about the situation and experiences higher anxiety about this situation as well as the other things going on at home that evening, we might be tempted to question the success of this regulatory effort. Therefore, when examining the influence of emotion regulation on affect and behavior, it becomes extremely important to juxtapose the immediate and delayed effects. This point becomes more central for the study of emotion regulation in psychopathology, as psychological disorders are characterized by vicious cycles in which individuals rigidly favor the short- over the long-term consequences of their behavior.

The primary way of addressing this limitation in the literature would consist of the development of paradigms that would allow for the joint examination of immediate and delayed effects of regulation. The simplest approach would involve the systematic incorporation of affective recovery periods, that is, a period following the regulation task in which participants sit quietly (e.g., Campbell-Sills et al., 2006). A more complex approach would consist of the incorporation of an additional task, the performance of which would be analyzed in relation to the type of regulation the participant conducted in the initial task. Of note, such spillover task need not be an emotion regulation task. For example, one could measure the influence of emotion regulation on attentional bias (e.g., Jamieson, Nock, & Mendes, 2011). To increase the ecological validity, researchers could collect data from the participant after the laboratory assessment has taken place. This could be done via a follow-up survey, a second visit to the laboratory, a diary study, or an EMA design (e.g., Ebner-Priemer & Trull, 2009). In this respect, Kuppens and colleagues have shown that emotional inertia, that is, the degree to which a person's current emotional state is predicted by the prior one, is positively associated with psychopathology (e.g., Kuppens et al., 2012).

Suggestions for the Simultaneous Examination of Contextual Components and Their Dimensions

Although a number of investigations have evaluated important variations in components (and their underlying dimensions) that influence emotion regulation, it is clear that most studies have made only modest attempts at modeling context. In this section, then, I propose an approach in which investigators would examine variation in several dimensions within components while holding the rest of them constant (of note, these dimensions need not belong to different components; for example, one could examine a few dimensions within the component of selection and implementation of strategies). One example mentioned in the introduction was a study examining the effects of instructed and spontaneous implementation of reappraisal and acceptance on negative affect in participants with social anxiety, those with binge eating disorder, and healthy controls in response to eating in front of other people. Contextual variability would be represented in a 3 (social anxiety, binge eating, healthy controls) × 2 (instructed

vs. spontaneous) × 2 (reappraisal vs. acceptance) design. The fixed dimensions would entail the emotion-eliciting stimuli and the short-term effects on negative affect. Another investigation could evaluate the effects of acceptance, suppression, and reappraisal on immediate and delayed affect and distress tolerance in healthy controls who watched anxiety-provoking pictures. Here, contextual variability would entail the selection of strategies (i.e., type of strategy instructed) and the effects of implementation (i.e., short versus long-term effects on affect and behavior). It would be represented in a 3 (acceptance, reappraisal, suppression) × 2 (affect vs. behavior) × 2 (immediate vs. delayed) design. The fixed dimensions would be psychopathology (i.e., healthy controls) and the type of emotion-eliciting stimuli (i.e., standardized pictures).

Given the large number of combinations, the choice of which dimensions to manipulate versus hold constant should be theory-driven based on a programmatic line of work. Some suggestions given the current directions in the field include (a) differentiating transdiagnostic versus disorder-specific deficits (e.g., Kring & Sloan, 2010); (b) evaluating the ability to flexibly switch between strategies on the basis of contextual demands (e.g., Bonanno et al., 2004); (c) modeling longitudinal and causal relationships between emotion regulation deficits and development of psychopathology (e.g., Nolen-Hoeksema, 2000; Nolen-Hoeksema & Watkins, 2011); (d) differentiating explicit from automatic or implicit processes (e.g., Koole & Rothermund, 2011); and (e) developing a more comprehensive understanding of emotion regulation goals (e.g., Tamir et al., 2008). This list is by no means exhaustive, and the possibilities are, indeed, endless.

Despite all these possibilities, there are certain guidelines that could be quite useful in organizing the systematic delineation of contextual factors. The previous examples shared the following characteristics: (a) they examined variation in multiple dimensions; (b) they modeled interactions among such dimensions; and (c) they carefully held constant the other dimensions. These would constitute the initial skeleton of this proposed contextual approach. Although modeling variation in some dimensions (e.g., demographic characteristics) would require large samples, many dimensions could be modeled as part of within-subjects designs. As mentioned earlier, it is my hope that this approach will inspire theoretical and empirical work that will eventually result in a more sophisticated understanding of such an elusive construct as context.

Concluding Remarks

In this review, I proposed an approach to the systematic study of contextual factors in emotion regulation. Such an approach consists of specifying the components that characterize emotion regulation (i.e., the organism carrying out the regulation; the emotion-eliciting stimuli; the selection and implementation of strategies; and the types of outcomes considered) and then systematically evaluating deviations in the dimensions underlying these components. In this way, context is operationalized in relative terms. I provided initial guidelines for how to combine such dimensions in order to capture substantial and meaningful contextual variability. It is my hope that this approach will inspire theoretical and empirical work that will contribute to the development of a more nuanced understanding of the relationship between context and emotion regulation. As the 18th-century Scottish philosopher David Hume said, "the passion, in pronouncing its verdict, considers not the object simply, as it is in itself, but surveys it with all the circumstances, which attend it" (Hume, 2004, p. 224). The time has come for emotion regulation researchers to systematically survey those circumstances and develop a more sophisticated understanding of this fascinating process by which heart and mind are constantly seeking to influence each other.

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Notes

1. It is important to highlight that a few recent empirical investigations examining emotion regulation in psychopathology have begun to expand on the basic emotion regulation paradigms to more comprehensively model the influence of additional components on the regulatory process. Of particular interest has been the work examining the construct of emotion regulation flexibility, conceptualized as the ability to switch between strategies in response to changing contextual demands. Bonanno and colleagues have shown that the ability to flexibly alternate between expression and suppression of facial expressions predicts long-term adjustment (Bonanno, Papa, O'Neill, Westphal, & Coifman, 2004), protects against the deleterious effects of cumulative life stress (Westphal et al., 2010), and is negatively associated with complicated grief (Gupta & Bonanno, 2011). Similarly, a recent diary study has shown that the inflexible implementation of experiential avoidance across contexts is positively associated with symptoms of depression (Shahar & Herr, 2011). Aldao and Nolen-Hoeksema (2012a) found that putatively adaptive strategies, such as acceptance and problem solving, are implemented with more variability across different situations than putatively maladaptive strategies and that such variability negatively predicts symptoms of psychopathology. Overall, this work represents a theory-driven expansion on the existing designs to assess contextual dimensions underlying the implementation of emotion regulation strategies. This is precisely where the field needs to be headed in order for emotion regulation to fulfill its promise of a construct that can help us understand dysfunction in psychopathology.
2. It could be easily argued that context plays a central role in all psychological processes and behavior.
3. A smaller number of investigations have examined the implementation of emotion regulation strategies in the context of tasks frequently used in the distress tolerance literature, such as the cold pressor (e.g., Feldner et al., 2003) or mirror tracing (e.g., Szasz et al.,

2011). Such tasks require participants to endure emotionally and/or physically unpleasant states in order to receive a reward or relief at a later point in time. Therefore, distress tolerance can be conceptualized as a specific instance of emotion regulation (for a review, see Zvolensky et al., 2010). Unfortunately, only a handful of investigations have examined distress tolerance and implementation of emotion regulation strategies in tandem, which has resulted in a limited understanding of the relationship between these processes.

4. Relatedly, Lieberman and colleagues (2007) have shown that affect labeling can dampen the experience of that very affect, as indexed by reduced amygdala activation.

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