Regulatory Flexibility: An Individual Differences Perspective on Coping and Emotion Regulation

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Regulatory Flexibility:

An Individual Differences Perspective on Coping and Emotion Regulation

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Abstract

People respond to stressful events in different ways, depending on the event and on the regulatory strategies they choose. Coping and emotion regulation theorists have proposed dynamic models in which these two factors, the person and the situation, interact over time to inform adaptation. In practice, however, researchers have tended to assume that particular regulatory strategies are consistently beneficial or maladaptive. We label this assumption *the fallacy of uniform efficacy* and contrast it with findings from a number of related literatures that have suggested the emergence of a broader but as yet poorly defined construct that we refer to as *regulatory flexibility*. In this review, we articulate this broader construct and define both its features and limitations. Specifically, we propose a heuristic individual differences framework and review research on three sequential components of flexibility for which propensities and abilities vary: sensitivity to *context*, availability of a diverse *repertoire* of regulatory strategies, and responsiveness to *feedback*. We consider the methodological limitations of research on each component, review questions that future research on flexibility might address, and consider how the components might relate to each other and to broader conceptualizations about stability and change across persons and situations.

Introduction

Psychology has long been concerned with the ways in which people respond to and regulate themselves in the face of aversive or challenging events. Research and theory over the past half century has culminated in an impressive body of evidence on the role that coping (Folkman & Moskowitz, 2004; Lazarus & Folkman, 1984) and emotion regulation strategies (Gross, 1998, 1999, 2002) play in overall adjustment. Although the theory behind these constructs has consistently emphasized their dynamic interplay with and across changing situational contexts (e.g., Barrett & Gross, 2001; Block, 1993; Cheng, 2001; Cole, Michel & Teti, 1994; Folkman & Lazarus, 1985; Gross, 1998, 1999; Lazarus & Folkman, 1984; Mischel, 1973), in practice researchers have tended to emphasize the primacy of putatively healthy or adaptive regulatory strategies over putatively unhealthy or maladaptive strategies. More recent research, however, has begun to advance person-situation interactionist models that emphasize the importance of flexibility in coping and emotion regulation (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Cheng, 2001; Kashdan & Rottenberg, 2010).

In this article, we first consider the limitations of a categorical perspective on regulatory strategies as consistently health-promoting or health-detracting, which we refer to as the fallacy of uniform efficacy. Next we introduce the concept of regulatory flexibility as an alternative to the categorical perspective, and consider how this perspective differs from other recent reviews of the coping and emotion regulation literature. We propose three sequential components of regulatory flexibility -- context sensitivity, repertoire, and response to feedback – with a particular emphasis on individual differences. We review existing research on each component, consider the limitations of that research and propose avenues for new studies. Finally, we consider how individual differences in the three components might relate to each other and to the broader conceptual literature on stability and change in behavior within persons and across

situations.

The Fallacy of Uniform Efficacy

Psychological theories of self-regulation owe an obvious debt to earlier theories of biological regulation. Early biological theories emphasized optimal functioning through the maintenance of equilibrium (Bernard, 1865), and homeostasis (Cannon, 1932). By contrast, early psychological theories tended toward a more skewed emphasis on dysfunctional or failed regulation. The Freudian concept of defense mechanism, for example, centered on the presumed need to thwart or contain instinctual and immature impulses. From a Freudian perspective, self-regulatory strategies were primarily fixed habits that were inherently adaptive and mature or maladaptive and immature (Vaillant, 1977).

With the subsequent emergence of research on cognitive and social processes, psychological theories advanced toward the more general models of coping that emphasized both the multiplicity of strategies and the dynamic nature of the coping process (e.g., Folkman & Lazarus, 1985; Lazarus, 1966; Lazarus & Folkman, 1984). Although stress and coping theory emphasized that coping efficacy was a matter of *fit* between the strategy and ongoing situational demands, in practice researchers and theorists have tended to catalogue specific coping strategies as either adaptive or maladaptive. It has been generally assumed, for example, that problem-focused coping strategies are considerably more adaptive than emotion-focused coping strategies (Baker & Barenbaum, 2007). The more recent research on emotion regulation has focused on a compatible but conceptually distinct set of strategies aimed primarily at the regulation of the frequency, experience, and expression of emotion. Although the study of emotion regulation diverged in important ways from the stress and coping perspective (Gross, 1999), the tendency to categorize emotion regulatory strategies in terms of their inherent adaptive or maladaptive consequences has nonetheless persisted (John & Gross, 2004; for a review see Aldao, Nolen-

Hoeksema, & Schweizer, 2010). We describe the tendency to assign a value judgment about the consistent efficacy or consistent lack of efficacy of a particular regulatory strategy as the *fallacy of uniform efficacy.* We use the term fallacy because this assumption fails to account for both the theoretical foundation of the relevant concepts and the empirical evidence on their associated outcomes across people and situations.

Variability in the efficacy of regulatory strategies

Considerable empirical evidence indicates that the efficacy of coping and emotion regulation strategies is variable. Although there is evidence suggesting that problem-focused coping is more adaptive than emotion-focused coping, for example, there is also ample evidence to suggest the opposite pattern (for reviews, see Austenfeld & Stanton, 2004; Smyth & Lepore, 2002). Overall, the relations of specific coping strategies to mental health outcomes are more variable than the assumption of uniform efficacy would predict (Folkman & Moskowitz, 2004). Moreover the within-person consistency of coping strategy use across situations is surprisingly modest (Cheng, 2001; Compas, Forsythe, & Wagner, 1988; Folkman, Lazarus, Dunkel-Schetter, Delongis, & Gruen, 1986; Kaloupek, White, Wong, 1984).

A similar variability is also evident for the efficacy of emotion regulation strategies. Much of the research on emotion regulation has been guided by Gross's highly influential process model and the proposition that emotion regulation strategies differ in terms of when they have their primary impact on the emotion-generation process (Gross, 1998, Gross & Thompson, 2007). Although Gross' model suggests dynamic variability in the consequences of various regulatory strategies, a considerable body of evidence nonetheless appears to indicate that emotional reappraisal is a generally efficacious and adaptive strategy whereas expressive suppression is nearly uniformly maladaptive (e.g., Gross, 1998, 2002; Gross & Levenson, 1997; John & Gross, 2004; Richards & Gross, 2000; Roberts, Levenson, & Gross, 2008; Srivastava et

al., 2009). A closer examination of the evidence, however, suggests a more nuanced conclusion (Aldao, 2013; Bonanno, 2001; Bonanno et a l., 1995; Clark & Finkle, 2004; Consedine, Magai, & Bonanno, 2002). For example, in a recent meta-analysis of 306 experimental comparisons, Webb, Miles and Sheeran (2012) examined the effectiveness of various emotion regulation strategies in modifying emotional outcomes. In contrast to the assumption of uniform efficacy, they observed only modest overall differences between types of strategy. Attentional deployment strategies (e.g., distraction or concentration) produced no overall effect, whereas response modulation strategies (e.g., suppression) had a small overall effect and cognitive change strategies (e.g., reappraisal) had small to moderate overall effects. Importantly, however, comparisons within-strategy produced the most robust effects. Of particular significance, and in contrast to the widely accepted assumption that emotional suppression is nearly always maladaptive, suppression of the expression of emotion generally proved effective whereas suppressing the experience of emotion and suppressing thoughts of the emotion-eliciting event were generally not effective. Also of interest, and in contrast to the widely accepted assumption that reappraisal is nearly always adaptive, reappraisals of the emotional response proved less effective than reappraising the emotional stimulus or using perspective taking.

Context, Time, and Choice

A key influence on the variability in efficacy of regulatory strategies is the shifting nature of contextual demands across time. The death of a loved one, for example, presents bereaved individuals with a varied and fluctuating set of situational demands. To accommodate these divergent demands, Stroebe and Schut (1999) proposed a dual process model of coping with loss in which different types of coping strategies become more or less necessary and effective over time. In reviewing the coping literature more generally, Folkman and Moskowitz (2004) observed that a specific coping process might be effective in one situation but not effective in

another. Thus, they concluded, a complete assessment of coping effectiveness must take into account characteristics of the context as well as the fit between context and coping. In a more recent review, Carver and Connor-Smith (2009) concluded that the relationship between coping strategy and adjustment is necessarily "moderated by the nature, duration, context, and controllability of the stressor" (p. 694).

Context effects are also readily apparent in emotion regulation. Studies of individual differences in emotion regulation through reappraisal, for example, show variable consequences and in some situations even negative consequences. Using an experimental measure, for example, Troy and colleagues (2010) found that reappraisal ability was associated with less depression but only among people with high levels of life stress. Of particular relevance, Troy, Shallcross, and Mauss (in press) recently qualified these effects by showing that reappraisal ability was associated with less depression among people who experienced high levels of uncontrollable stress but with *more depression* among people who experienced controllable stress. In explanation of these findings, they concluded that when stress is uncontrollable, changing the situation is difficult and thus changing one's emotions through reappraisal is likely a more efficacious strategy. By contrast, when stress is controllable, it may be more adaptive to change the situation than to change one's emotions.

In a recent expansive review of the emotion regulation literature, Aldao (2013) reiterated the dynamic nature of emotion regulation processes and highlighted the crucial importance of a broad range of contextual factors that influence the efficacy of specific strategies, including aspects of the person (e.g., demographic variation, personality), the stimuli used to elicit emotion, the ways emotion regulation strategies are selected and implemented, and the types of outcomes assessed. Noting a relative dearth of research on these factors, Aldao reviewed evidence on each component in detail, explored its limitations in the extant literature, and proposed solutions that

might systematically address these shortcomings in the future studies. It s also worth noting that mounting evidence for cultural and social variations in the utility and costs of emotion regulation suggest additional factors that might modulate the consequences of specific regulatory processes (Burns, Isbell, & Tyler, 2008; Butler, Lee, & Gross, 2007; Consedine, et al., 2002; Matsumoto et al., 2008; Mauss & Butler, 2010; Mesquita & Albert, 2007).

Finally, Sheppes et al. (2012) recently zeroed in on the crucial role of choice in regulatory strategy use across time and context. Describing their own carefully developed studies (Sheppes et al., 2011, 2012), they framed this work in terms of the temporal unfolding of emotion regulation processes. Specifically, Sheppes et al. (2012) contrasted early, disengagement strategies (e.g., distraction) that involve disengaging attention from emotional processing before it is represented in working memory with later-stage engagement strategies (e.g., reappraisal) that involve elaborating on emotional information and then altering its meaning. In a series of incremental studies, they showed convincingly that in contexts where the intensity of the emotional situation was low, people tended to choose a later-stage engagement strategy, whereas in contexts where the emotional intensity was high people tended to chose an early stage disengagement strategy. Importantly, Sheppes et al. (2012) also demonstrated that regulatory choice was moderated by cognitive and motivational factors (e.g., financial reward, long-term goals, strategy complexity).

Individual Differences in Regulatory Flexibility

Taken together, the confluence of the findings reviewed above suggests that the use and functional benefits of any specific type of self-regulatory strategy will tend to vary across people and situations, and by extension that the most efficacious employment of self-regulatory strategies is likely to be one that is most flexible (Aldao, 2013; Bonanno, 2004, 2005; Bonanno et al., 2004; Cheng, 2001; Kashdan & Rottenberg, 2010; Sheppes et al., 2012). Although the idea

of regulatory flexibility is not new (e.g., Barrett & Gross, 2001; Block & Block, 1980; Cheng, 2001; Cole, Michel & Teti, 1994; Folkman & Lazarus, 1985; Mischel, 1973; Stroebe & Schut, 1999), researchers have only recently begun to directly investigate aspects of flexibility empirically.

The first studies to explicitly address the issue of coping flexibility were initiated by Cheng and colleagues (Cheng, 2003; Cheng et al., 2000, 2001; Chiu et al., 1995). In a seminal paper, Cheng (2001) noted that there was little consistency in the use of coping strategies across situations and that a more complete understanding of the coping process necessitated the examination of the flexible deployment of different coping strategies in distinct stressful contexts. Emotion theorists have similarly championed the idea that both down-regulation (e.g., suppression) and up-regulation (expression) are essential for healthy adjustment (e.g., Bonanno, 2001; Consedine et al., 2002; Gross, 1998; Gross & Thompson, 2007; Ochsner et al., 2004). Work from our lab initiated the formal investigation of flexibility in emotion regulation by measuring within-individual variations in emotional expression and suppression (Bonanno et al., 2004; Gupta & Bonanno, 2011; Westphal, Seivert, & Bonanno, 2010). Extending Cheng's insights, we argued that neither the expression nor suppression of emotion expression is as important for adjustment as is the *ability* to flexibly express or suppress emotional expression as demanded by the situational context (Bonanno et al., 2004).

As research on regulatory flexibility progressed, findings from a number of related literatures (e.g., Gruber, Mauss, & Tamir, 2011; Kashdan & Rottenberg, 2010; Kross, Ayduk, 2011; Mendes, Reis, Seery, & Blascovich, 2003; Troy, Shallcross, & Mauss, in press; Sheppes et al., 2012; Tamir, 2009) have begun to suggest the emergence of a broader but as yet poorly defined construct. The need to develop this broader construct and to begin to articulate both its features and limitations was the primary motivation for the current review. Specifically, we

attempt to review and integrate the expanding research on regulatory flexibility, and in doing so to advance conceptions of coping and emotion regulation in three important ways.

First, and perhaps most crucial, our review targets individual differences. Although previous reviews have acknowledged this aspect of self-regulation, their primary focus has been on general strategies and mechanisms as they manifest across individuals. The importance of individual differences in psychological flexibility was highlighted recently in an expansive review by Kashdan and Rottenberg (2010). They examined flexibility in experimental research, diary and questionnaire studies, and life-span research, and spread the scope of their review across a broad range of dynamic processes, including coping, emotion regulation, variation in life domains (e.g., work, relationships, or leisure), and time orientation (e.g., focusing on past, present, or future goal pursuits). Despite the breadth of their approach, they found flexibility consistently emerging as a crucial component of overall health and adjustment. Complimentarily, they also numerated the absence of flexible processes or inflexibility in various features of dysfunction and psychopathology (e.g., rumination) (see also Aldao, Nolen-Hoeksema, & Schweizer, 2010).

Although our review shares some similarities with Kashdan and Rottenberg (2010), in contrast to their broad approach, we chose to narrow our focus to include only research that has focused on psychological regulatory systems for dealing with stress, such as studies of coping and emotion regulation. Although coping and emotion regulation are distinct and separable domains (Gross, 1999), they are arguably guided by the same over-arching principles of self-regulation (Tamir, 2009), often manifest in concert with one another, and are both readily understood from a flexibility perspective (e.g., Cheng, 2001; Folkman & Moskowitz, 2004; Skinner & Zimmer-Gembeck, 2006).

Second, we sought to articulate linkages among an inter-related yet functionally distinct

suite of regulatory processes that in combination comprise the broader construct of regulatory flexibility. Like Aldao (2013) and others (Folkman, 1984; Gross, 1998; Gruber et al., 2011; McCrae, 1984; Sheppes et al., 2012; Tamir, 2009), we emphasize the crucial importance of context. However, within the framework we propose here, flexibility is not a uniform construct but instead an ongoing and multifaceted reaction to stressor variability. Our position therefore extends beyond the articulation of general contextual factors and rather emphasizes variability in multiple components of the response to shifting contextual demands. Specifically, we define *context sensitivity* as the ability to perceive impinging demands and opportunities from the situational context as they emerge over and above the normative background of ongoing regulatory concerns and processes, and to determine the most appropriate regulatory strategy in response to those demands or opportunities. Additionally, we view context sensitivity as intimately linked to individual differences in two other components of regulatory flexibility: repertoire and feedback. We define the *repertoire* component as the ability to utilize a wide range of regulatory strategies that might accommodate divergent contextual demands and opportunities. We define the *feedback* component as the ability to monitor and use feedback about the efficacy of a chosen regulatory strategy over time so as to adjust or correct behavior when needed. Although these components are not novel, we emphasize their over-arching nature as well as their integrative potential to characterize both coping and emotion regulation processes.

Third, we attempted to develop a broader perspective that articulates the temporal relationship among these three components as they unfold sequentially and how this may affect the course of adjustment. Because there is relatively little research on this aspect of regulatory flexibility, we discuss these linkages in a more speculative manner. Compatible descriptions of processing stages have been observed for both coping (Aspinwall & Taylor, 1997) and emotion regulation (Sheppes et al., 2012; Webb, Gallo, Miles, Gollwitzer, & Sheeran, 2012). However,

our framework focuses only on what appears to be the essential processes that comprise regulatory flexibility along with their corresponding types of abilities (see Figure 1).

Briefly, the sensitivity toward the impinging demands and opportunities in the situational context serves as a crucial initial component of flexible responding. Variations in context sensitivity in turn exert a strong impact downstream on the subsequent selection of the most appropriate regulatory strategy. Sensitive perception of contextual demands and opportunities will increase the likelihood of flexibility in subsequent phases. By contrast, the relative lack of sensitivity to contextual demands or opportunities will reduce flexibility in subsequent phases. The second component in our sequence of regulation, enacting the chosen strategy, is in turn influenced by individual differences in the repertoire of regulatory strategies available. Finally, once a strategy has been enacted, flexible responding is further supported or reduced by the ability to monitor feedback regarding the efficacy of the chosen regulatory strategy so as to maintain, cease, or select an alternative regulatory strategy (Gross & Thompson, 2007; Kalisch, 2009). We elaborate this sequence in greater detail as we discuss each component below.

Three Sequential Components of Regulatory Flexibility

Context Sensitivity

Biological regulatory systems are widely understood using a cost-benefit evolutionary perspective (Kalisky, Dekel, & Alon, 2007; Orr, 2005) in which the most likely adaptations are those that provide the greatest benefit at the smallest cost. No adaptation is perfect, however, and even the most fitness-enhancing adaptations unavoidably incur at least some cost. The salience of those costs depends on context (e.g., Tooby & Cosmides, 1990). The peacock's stunningly colorful tail, for example, signals genetic fitness and thus appears to have evolved as a highly effective solution to the problem of sexual selection. However, in non-mating contexts such a large and cumbersome tail becomes problematic, as for example when the peacock attempts to

elude a predator (Houle & Kondrashov, 2002; Petrie, 1994).

Extending this same cost-benefit analysis to human coping and emotion regulation suggests that the efficacy of any particular behavior or strategy will also tend to depend on context (Aldao, 2013; Folkman, 1984; Gross, 1998; McCrae, 1984; Sheppes et al., 2012; Tamir, 2009). Accordingly, as we show in Figure 1, the first step in flexible self-regulation necessarily involves evaluation of the impinging demands and opportunities presented by a stressful situational context and of the most appropriate or most effective regulatory strategy. This evaluation occurs over a background of ongoing appraisal processes involving general monitoring of goals (Carver & Scheier, 1982), mood and affect (Russell & Barrett, 1999), motivation (Ryan & Deci, 2000), and social interactions (Taylor, Wayment, & Carillo, 1996) and is necessarily a probabilistic judgment. For even the most context-sensitive person, the perception and understanding of situational demands and opportunities is only as accurate as the context allows. Many stressor situations provide relatively clear contextual cues about the impinging demands and opportunities, and in such situations it is possible to estimate with considerable confidence what the most effective regulatory strategy might be. However, in stressor situations where the contextual demands and opportunities are less readily decoded, determination of the most appropriate or effective regulatory strategy becomes more of a best guess among plausible alternatives. It is precisely because contextual evaluations are not perfect, however, that it is often necessary to revise and adjust regulatory strategies further along in the regulation process. We return to this important point later as we discuss the feedback component of regulatory flexibility.

Cues about coping across situations. Considering first the voluminous literature on coping, it is well established that in general people can identify the nuances of different types of stressful situations and will tend to employ different coping strategies across different types of

situations (Carver & Connor-Smith, 2010; Folkman & Moskowitz, 2004; McCrae, 1984). Nonetheless, there is considerable individual variability in coping use and that variability depends in part on individual differences in the appraisal of contextual features. Marked variation has been observed, for example, in appraisals of the relative controllability or uncontrollability of a stressor (Folkman, 1984). Importantly, sensitivity to controllability appears in turn to foster successful coping, as appraisals of controllability have been shown to at least partially moderate both the use and the efficacy of different types of coping strategies (Cheng et al., 2001; Cheng & Cheung, 2005; Conway & Terry, 1992).

Cheng and colleagues have referred to sensitivity to the contextual cues that distinguish different types of stressful situations as *discriminative facility* (Cheng, 2003; Cheng et al., 2000, 2001; Chiu et al., 1995). In one set of studies, for example, Cheng et al. (2001) defined discriminative facility in terms of the frequency that participants' perceived responses to hypothetical stressful situations matched those that had been determined *a priori* by consensus from an independent set of raters (Chiu al., 1995). Examples of such situations include being somewhat nervous flying in airplanes and encountering dramatic turbulence on a flight; knowing that things are going poorly at the company where you work and learning that in a few days decisions will be made about which employees will be laid off; attending a formal business dinner with your supervisor and realizing you do not know any of the people at the dinner and that you are uncertain about appropriate social behavior; and visiting a clinic for a check-up and learning that you have a treatable form of cancer. Although personality and other idiosyncratic preferences would likely moderate regulatory choice in these contexts (e.g., Tamir, 2005, 2009), independent ratings for the first two scenarios suggest that the overall most efficacious coping strategy would involve disengagement or distraction, such as trying to focus on reading a book or writing a letter (airplane) and going to a movie to stop thinking about the event (pending layoffs

at work). Similarly, independent ratings for the last two scenarios suggested the overall most efficacious coping strategy would involve engagement or monitoring strategies, such as observing other people to learn how people socialize (dinner party) and paying close attention to signs of deteriorating health (treatable cancer). Individual differences in discriminative facility measured this way were uncorrelated with a measure of socially desirable responding, but associated positively with both cognitive complexity (Cheng et al., 2001) and the flexible use of coping strategies (Cheng, 2003; Cheng et al., 2000; Cheng & Cheung, 2005).

Emotion-evoking cues. Perception of situational nuances also plays a crucial role in emotion regulation as a means of facilitating the match between emotion and context (Ellsworth & Scherer, 2003). Emotion theorists have emphasized a broad range of appraisal dimensions, including controllability as well as novelty, pleasantness, and possibility for goal attainment (Ellsworth & Scherer, 2003; Lazarus, 1991; Roseman, 1991; Smith & Ellsworth, 1985). It should be noted that in traditional coping theory, cognitive appraisal naturally precedes the selection of coping strategies, whereas the distinction between appraisal and emotion is less clearly separable (Frijda & Zeelenberg, 2001; Gross & Barrett, 2011; Gross, Sheppes, & Urry, 2011). Regardless of their temporal relation, most emotion theorists believe that the functions of emotions are "context bound" (Cole, Michel, & Teti, 1994, p. 84). Put differently, emotions are assumed to have evolved to help solve specific problems in specific situations (Tooby & Cosmides, 1990) and, accordingly, emotions are most adaptive when they occur in the circumstances that most closely match the specific problems and specific situations for which they appear to have evolved (Rottenberg, 2005; Rottenberg & Gotlib, 2004; Coifman & Bonanno, 2009). For example, anger is commonly believed to be associated with appraisals of injustice or affront at the hands of a blameworthy other (Lazarus, 1991). Thus, in situations of perceived injustice, anger potentially facilitates adaptive responding (e.g., Lerner, Goldberg, & Tetlock, 1998). By

the same token, when anger is expressed in contexts that require rapport-building or affiliation, it can potentially damage relational bonds (Bonanno & Keltner, 1997; Cole & Zahn-Waxler, 1992; Keltner et al., 1993).

Dysfunctional emotion responses have been defined as those that occur outside their "typical incentive contexts" (Goldsmith & Davidson, 2004, p. 363), such as when emotional responses occur irrespective of, extend beyond, or are insufficient or inappropriate in relation to the demands and opportunities of the situation. The repeated failure to respond in a manner that is sensitive to stressor context, by extension, can be viewed as a form of emotion dysregulation (Cole et al., 1994) that when extreme can lead to psychopathology (Davidson, 2000; Kring, 2008). Emotion context insensitivity has in fact been associated with several emotion disorders, most notably depression and anxiety (Coifman & Bonanno, 2010; Gehricke & Shapiro, 2000; Larson et al, 2007; Rottenberg & Gotlib, 2004; Rottenberg et al., 2002, 2005; for reviews see Rottenberg, 2005; Bylsma, Morris & Rottenberg, 2008; and Coifman & Bonanno, 2009). Major depressive disorder (MDD), for example, is commonly associated with emotional dysregulation and in particular with "stereotyped and inflexible responses to variety of emotional stimuli" (Rottenberg et al., 2002, p. 136).

One way that experimental studies of context sensitivity in emotional responding have operationalized contextual demands is through emotion-evoking films (e.g., Rottenberg et al., 2002; Rottenberg, Gross, & Gotlib, 2005). Using film stimuli that have been empirically associated with specific target emotions (Gross & Levenson, 1995; Schaefer, Niles, Sanchez, & Phllipot, 2010), contextually sensitive appraisals are inferred when participants exposed to these films report, express, or exhibit physiological responses consonant with the associated emotion.

The film context paradigm has provided compelling data on the links between context sensitivity and adjustment. Rottenberg and colleagues (2002, 2005) have found, for example, that

depressed participants' experience of sadness was incongruent to what would be expected across film contexts. Specifically, depressed participants reported about the same amount of sadness as nondepressed participants after watching a sad film, but greater sadness than nondepressed participants after watching neutral or amusing films. Moreover, context sensitive reactivity to the sad film was associated with reduced depression severity, reduced depression episode length, and better global functioning. Importantly, these results held even when initial levels of sadness were taken into account, indicating that the poorer functioning of depressed individuals was not explained by baseline sadness, but rather by the inability to *modulate* sadness across contexts (Rottenberg et al., 2002). Using a similar experimental paradigm, Bullock and Bonanno (2012) coded facial expressions of sadness in bereaved individuals meeting criteria for Complicated Grief, a diagnostic category indicative of poor functioning and an inability to get over a loss, and in healthy bereaved participants. The Complicated Grief participants showed less variability in sad facial expressions across sad and neural film contexts compared to the healthy group.

Data from studies using longitudinal and prospective designs suggest a possible role of context insensitivity in the maintenance, recovery and development of pathology. Formerly depressed individuals (i.e., depressed previously but not depressed at the time of the study) no longer exhibited emotional context insensitivity (Rottenberg et al., 2005). However, among bereaved individuals with elevated symptoms of depression 4 months after the loss, those who evidenced a lack of sensitivity to emotional context still had high levels of depression symptoms at 18 months, whereas those who showed context sensitive emotional responding at 4 months had marked reductions in depression symptoms by 18 months (Coifman & Bonanno, 2010).

What about positive emotion? In recent years, an impressive body of research has amassed to support the adaptive, resource-building benefits of positive emotion (Fredrickson, 2001; Fredrickson & Cohn, 2008; Ong, 2010). Positive emotion facilitates coping (Folkman &

Moskowitz, 2000), enhances personal and social resources (Keltner & Bonanno, 1997; Harker & Keltner, 2004), and in the aftermath of aversive life events predicts better long-term adjustment (Bonanno & Keltner, 1997; Ong et al., 2011; Papa & Bonanno, 2008). Importantly, however, positive emotions like negative emotions evidence context effects (Gruber, Mauss, & Tamir, 2011). A number of studies, including some of those reviewed above, have indicated that failure to appraise and respond to contexts associated with positive emotions is linked to impaired adjustment. For example, individuals with bipolar disorder show especially strong positive emotional responses (Johnson, 2005) but do not appear to differentiate between contextually positive situations versus non-positive situations (Gruber et al., 2011). Similar findings have also been observed for individuals deemed at risk for bipolar disorder (Gruber, Johnson, Oveis, & Keltner, 2008). Depressed individuals, by contrast, have been found to respond less fully to positive contextual cues than nondepressed individuals (Gruber, Oveis, Keltner, & Johnson, 2010; Rottenberg et al., 2002, 2005). Complimentarily, for depressed bereaved individuals, the experience and expression of positive emotion in contextually relevant situations early in bereavement predicted reductions in depression at later points in bereavement (Coifman & Bonanno, 2010).

Avenues for future research. Although these findings provide important preliminary evidence that sensitivity to contextual cues is a key component of flexible adaptation and, more broadly, psychological adjustment, a great deal more research is needed. The measurement of context sensitivity from behavioral responses is potentially problematic, for example, because it may blur the distinction between appraisal and regulatory strategy. In some approaches, such as the emotion film paradigm described above, this concern is minimized because the associations between context and emotion are documented in previous empirical studies and because participants have no other task than to watch the film, thus keeping regulatory demands to a

minimum. Nonetheless, even in simple contexts, participants may use multiple regulatory strategies (Aldao & Nolen-Hoeksema, 2012a). In more complex, real-world situations, determining the contextual evaluation from the behavioral response is considerably more problematic.

One promising method to address this issue in future research would be to expand the use of pre-rated stressor situations similar to those employed by Cheng and colleagues (2001). When originally norming these situations, Chiu et al. (1995) presented a panel of 10 raters with a small set of potentially stressful scenarios and asked them to choose the best regulatory strategy from a fixed pair of responses. Situation-strategy combinations that were most consistently paired were then used in subsequent research to connote contextually sensitive responses. Future research could easily increase the reliability of this method by engaging a considerably larger number of judges to rate a greater number of potentially stressful situations for a wider range of possible regulatory strategies. It should also be possible to validate the situation-strategy pairs against other indices, such as patterns of neural activity associated with the expected response (Decety & Chaminade, 2003).

Future research might also consider how context sensitivity varies in relation to ongoing regulatory goals (Gross & Thompson, 2007; Ochsner et al., 2004; Tamir, 2009). In many cases, the goals people might hold for different situations will be heavily influenced by obvious demands or opportunities emanating from the situations themselves, and thus will be consonant with those demands or opportunities. Situations suggestive of an interpersonal confrontation, for example, often evoke anger as a means of preparing for the confrontation. Consistent with this idea, Tamir, Mitchell, and Gross (2008) examined preferences for activities designed to induce anger (e.g., recalling past events in which they were angry or listing to anger-inducing music) and other emotions in participants just prior to their engaging in computer games that were either

confrontational (e.g., killing enemies) or nonconfrontational (e.g., building an empire). Although participants expected anger-inducing activities to be unpleasant, they were nonetheless more likely to choose anger-inducing activities rather than exciting but pleasant activities or neutral activities when they thought they were going to play confrontational games. Similarly, Tamir (2009) has shown that when anticipating an effortful task that requires motivation, people will prefer to feel happiness over non-positive emotions.

Importantly, however, in some situations, personal goals may heavily color how the impinging contextual demand or opportunities are perceived, and in extreme cases may even over-ride the contextual factors. Of relevance here is Tamir's (2009) utility model which predicts that the emotions people choose to experience will depend in part on whether their goals are aimed at immediate or future benefits, and whether the perceived pleasure or utility of the emotion satisfies those goals. What is not currently known however is whether the salience of personal goals might enhance or detract from context sensitive responding. Similarly, there is currently little data from which to evaluate the question of whether a mismatch between personal goals and salient contextual cues might undermine ongoing regulation efforts and, ultimately, adjustment. We return to this issue briefly at a later point in our review.

Repertoire

Sensitivity to the impinging demands or opportunities suggested by a stressor situation helps to illuminate the most context-appropriate regulatory strategies for responding to those demands or opportunities. By the same token, faulty or less sensitive appraisals of the stressor context will make it more difficult to select appropriate regulatory strategies. In this way, individual differences in context sensitivity feed-forward and exert a significant influence on subsequent ability for flexible self-regulation further downstream. Regardless of quality of the contextual appraisal, however, some form of regulation is indicated and the capacity to enact that

regulation will depend on another individual differences component: the extent of a person's repertoire of regulatory strategies.

As we noted earlier, the available evidence has shown that the consequences of different regulatory strategies predictably vary by context. However, evidence has also begun to accrue for individual differences in the ability to use different strategies (i.e., repertoire), and for positive associations between strategy repertoire and psychological adjustment. To date, three distinct but compatible approaches to the assessment of repertoire have been employed. Briefly, these approaches pertain to the size, temporal variability, and categorical variability of the repertoire.

Number of strategies. Measurements of repertoire size focus on the total number of different regulatory strategies people report. In a prospective study of traumatic stress assessed before and repeatedly after a campus mass shooting, Orcutt et al. (2013) found that students who evidenced a resilient trajectory of stable low traumatic stress across time also reported being able to access a greater number of emotion regulation strategies after the shooting. Students who reported access to fewer emotion regulation strategies after the shooting had considerably higher levels of traumatic stress. In a study conducted in Hong Kong, Lam and McBride-Chang (2007) found that participants who reported using a greater number of coping strategies were less distressed and, importantly, showed less impact of cumulative life stress. By contrast, participants who reported using fewer types of coping were more distressed and had greater distress at higher levels of cumulative life stress.

Temporal variability. A second, more elaborate method to assess repertoire examines temporal variability in regulatory strategy across time and stressor situation. For example, Gintner, West, and Zarski (1989) examined use of coping strategies among students just prior to a stressful examination and again just before learning the results of the exam. They stratified

students on resourcefulness, a dimension previously associated with use of a broader repertoire of coping strategies (Rosenbaum, 1980). The students who scored high on resourcefulness modulated their use of problem-focused coping from before to after the exam, whereas those scoring low on resourcefulness evidenced no change in their coping behavior and furthermore reported higher levels of stress at both time points. In a more elaborate study of temporal variability, Cheng (2001) used a clustering procedure to identify groups of individuals with distinct perceptions of the kinds of coping strategies they would use across different types of situations. One group, described as flexible copers, showed a similar pattern across five separate studies; they used different kinds of coping strategies and they altered their coping strategy use systematically in response to situational variation. The flexible group also had consistently higher perceived coping effectiveness, and less depression both concurrently and at a future assessment, compared with other participants. Recent longitudinal studies that included repeated measures of coping have similarly reported an association between level of adjustment and change in coping strategy use across time (Gall, Evans, Bellerose, 2000; Gall et al., 2009).

Categorical variability. A third method for assessing repertoire, which we refer to as categorical variability, measures the extent that a person is able to use diverse types of regulatory strategies. This form of measurement appears to be especially applicable to highly aversive or traumatic life events (Bonanno, 2004, 2005). Not only are the challenges presented by such events intensified, they are also more enduring and variable, and often require dramatically different types of coping over time. Stroebe and Schut's (1999) dual-process model of bereavement, for example, emphasizes the necessity of both *loss-oriented* coping strategies that deal with the direct stress of the loss, and *restoration-oriented* coping strategies that aim more at the secondary stressors that are also consequences of bereavement. Applying a similar idea to the broader category of potentially traumatic events (PTEs), our research team developed the

Perceived Ability to Coping with Trauma (PACT; Bonanno, Pat-Horenczyk, & Noll, 2011). The PACT was derived from an assortment of items designed to capture sets of opposing coping strategies (e.g., "distract myself to keep from thinking about the event" versus "face the grim reality head on"). Exploratory and confirmatory factor analyses using different samples in different countries (United States and Israel) revealed two clear over-arching subscales. These subscales mirrored the basic distinction of engaging and disengaging strategies commonly observed as fundamental modes of both coping (e.g., approach and avoidance strategies, Roth & Cohen, 1986) and emotion regulation (Field, 1994; Thayer & Lane, 2000; Sheppes et al., in press). The *trauma focus* subscale consists of coping strategies that engage with the traumatic event, such as fully experiencing the event's cognitive and emotional significance, or thinking realistically and remaining focused on the event. The *forward focus* subscale consists of coping strategies that foster disengagement from the event, such as maintaining previous goals and plans, caring for others, reducing painful emotions, and using distraction and amusement. These scales can be used individually to assess each dimension of the repertoire and its relationship to shifting contextual demands, or combined using an algorithmic index of repertoire flexibility that estimates the ability to engage in both types of coping with equal facility.

In an initial cross-sectional study using the PACT, Israeli students exposed to terrorist violence and high in repertoire flexibility showed relatively little evidence of posttraumatic stress (Bonanno, Pat-Horenczyk, & Noll, 2011). By contrast, students low in repertoire flexibility had marked increases in posttraumatic stress at higher levels of trauma exposure. In a longitudinal study of adjustment among college students exposed to various stressors (Galatzer-Levy et al., 2012), the most consistently well-adjusted students had higher repertoire flexibility. Finally, bereaved individuals high in repertoire flexibility on the PACT were relatively symptom-free and similar to a comparable group of married (nonbereaved) individuals, whereas bereaved

individuals meeting diagnostic criteria for Complicated Grief were less flexible and, in particular, had low scores on the forward focus scale (Burton et al., 2012).

Using a more global approach to identify categorical variability in a sample of adolescents, Lougheed and Hollenstein (2012) subjected a number of established emotion regulation measures to a latent profile analysis. They identified six key categories of regulation. Adolescents with profiles indicating that they used a greater range of emotion regulation categories had fewer internalizing symptoms (e.g., depression, anxiety) compared with adolescents whose profile suggested they used fewer categories of regulation.

Studies of categorical variability in emotion regulation have adopted an experimental approach designed to capture variability in up- and down-regulation strategies. Neuroscience data have clearly shown that although up-regulation and down-regulation recruit common brain regions suggestive of at least some similar underlying processes, each type of regulation is also associated with unique areas of activation (Kim & Hamann, 2007; Ochsner et al., 2004). Extending this research, our team developed a paradigm specifically intended to measure individual differences in the ability to use both up- and down-regulation strategies (Bonanno et al., 2004). We showed participants emotionally evocative photos, and informed them that an observer in another room would view them from a monitor and attempt to guess their emotions, and then on different trials provided three different regulatory instructions: 1) behave normally; 2) enhance your expression to make it easier for the observer to guess your emotion; or 3) suppress your expression of emotion so that it would be more difficult for the observer to guess your emotion. Judges then blindly coded videotapes from these trials for visible signs of emotion. Using these data, we compared each participant's coded expression scores across conditions and created individual differences measures for enhancement ability (enhancement condition minus behave-normal condition) and suppression ability (behave-normal condition minus suppression

condition). To assess the long-term consequences of these abilities, we examined data on students who had begun college in New York just prior to the September 11th terrorist attack and then again 2 years later. Controlling for baseline distress, the ability to enhance emotional expression and the ability to suppress emotional expression each independently predicted reduced distress two years after 9/11. More importantly, the combination of enhancement and suppression ability scores into a single expressive repertoire score that indexed the ability to use both regulatory strategies produced a stronger inverse relationship to distress. Complimentarily, students who exhibited ability in only one form of regulation (i.e., a lesser expressive repertoire) did not show improved adjustment.

Extending this research, Emery and Hess (2011) reported that expressive repertoire abilities, measured using the same experimental paradigm, were similar in young and older adult samples. Westphal et al. (2010) reported that these abilities also appear to have a trait-like quality. They re-tested participants from the Bonanno et al. (2004) study three years later using the same experimental paradigm. Despite the lengthy interval, expressive repertoire evidenced surprisingly high test-retest correlation. In that study, participants with greater expressive repertoire again had better overall psychological adjustment. Importantly, Westphal et al. (2010) also introduced a subliminal threat prime and included data on cumulative life stress. Consistent with the hypothesis that flexibility acts as a buffer against life stress, the links between adjustment and expressive repertoire were most evident under conditions of threat priming and among participants with the highest levels of life stress. Finally, in another recent study using the same experimental paradigm, bereaved individuals with Complicated Grief disorder had less expressive repertoire than bereaved individuals who were no longer symptomatic and a comparable group of married individuals (Gupta & Bonanno, 2011).

Avenues for future research. When considered together, this evidence provides

important preliminary evidence for the repertoire concept. It will be crucial that further studies continue to investigate repertoire size as well as temporal and categorical variability in strategy use, and in particular how these different aspects of repertoire might relate to each other. It will also be crucial that future experimental studies incorporate a greater number of regulatory strategies into their designs (Aldao, 2013; Aldao & Nolen-Hoeksema, 2012a), and strive to include comparisons of regulatory strategies that have not typically been examined in the same participants (e.g., reappraisal and suppression).

Given the compelling experimental data for individual differences on the up- and down-regulation of emotion expression, an especially informative direction for future research would be to extend this paradigm to include regulation of affective experience. A key problem in advancing research on the regulation of affect, however, is that self-reports of internal experience in this context are highly susceptible to demand characteristics. The use of facial EMG to measure global variations in positive or negative affective experience across different regulatory conditions (e.g., Jackson et al., 2000) suggests a promising solution. This approach is replicable (e.g., Deveney & Pizzagalli, 2008) and has been shown to function independent of shifts in visual attention (Urry, 2010). Although not yet used to map individual differences in regulatory ability, facial EMG might be used to compare any number of regulatory strategies that target affective experience, and we are currently exploring comparisons of this nature in our laboratory.

Another promising approach, one that we are also currently exploring in our laboratory, centers on the use of event-related brain potentials (ERP) and in particular the late positive potential (LPP). The LPP is a temporally late ERP component generally associated with enhanced response amplitude following onset of motivationally relevant stimuli. Previous research has consistently found, for example, that viewing both positive and negative stimuli augments LPPs relative to neutral stimuli (Schupp et al., 2000; Cuthbert et al., 2000; Dennis &

Hajcak, 2009; Hajcak & Dennis, 2009). Of particular relevance to the repertoire component, LPPs appear to be sensitive to regulatory strategy. LPPs following emotion-evoking stimuli are reduced, for example, when participants are instructed to use non-emotional appraisals (Hajcak, Moser, & Simons, 2006), to directly suppress their affective response (Moser, Hajcak, Bukay, & Simons, 2006), or to focus on neutral aspects of stimuli in working memory (Thiruchselvam, Hajcak, & Gross, 2012). There is also preliminary evidence that the LPP may be sensitive to enhancement strategies (DiCicco, Hajcak, Bonanno, & Dennis, 2012).

Neuroimaging (e.g., fMRI) is another, perhaps especially amenable approach for the study of individual differences in affective flexibility (van Reekum et al., 2007). For example, Opitz, Rauch, Terry, and Urry (2012) recently used fMRI to monitor prefrontal cortex activity in older and younger adults as they viewed aversive pictures or attempted to increase or decrease negative affect through cognitive reappraisal. Although they did not examine individual variation in regulatory strategy *per se*, Optiz et al. (2012) nonetheless demonstrated intriguing age differences in reappraisal ability at the level of both self-reported affect and neural activation.

Responsiveness to Feedback

As essential as context sensitivity is to flexible regulation, it is important to underscore again that the appraisal of a stressor will not always be accurate or in some cases possible. Similarly, even people with the most robust repertoire of regulatory strategies may find themselves unable to muster the appropriate strategy to respond to a stressor event. To accommodate this problem, a final sequential component of regulatory flexibility involves the ability to monitor feedback about the efficacy of the regulatory strategy that has been enacted and to maintain or adjust that strategy, end the strategy, or select a new regulatory strategy as needed.

The incorporation of feedback to monitor and adjust behavior is a fundamental

component of control theory and has long been viewed as crucial in psychological theories of self-regulation (Carver & Scheier, 1982). From a coping perspective, Folkman and Moskowitz (2004) observed, for example, "what might be considered effective coping at the outset of a stressful situation may be deemed ineffective later on" (p. 754). Similarly, emotion and coping theorists have stressed the importance of feedback as a key component in the maintenance or readjustment of regulatory strategies (Aspinwall & Taylor, 1997; Bonanno, 2001; Scherer, 2001; 2009; Sheppes et al., 2012).

Inclusion of the feedback component in our framework of flexible self-regulation hinges, as do the previous two steps in the flexible regulation process, on individual differences in the ability to engage such processes. The ability to monitor and utilize feedback shares some similarities with the two previous components, but is also distinct in several important ways. Similar to context sensitivity, the feedback stage involves an evaluation process. However, the goal of evaluation at the feedback stage is no longer to determine what strategy should be selected, but rather whether the strategy that was selected had been effective. Similar to the repertoire component, the feedback stage is to some extent moderated by individual differences in a person's repertoire of possible strategies. However repertoire influences the feedback stage only in so far as it informs whether there might be an alternative strategy that could better address the situational demands or opportunities (Kalisch, 2009; Sheppes et al., 2012).

In one of the few attempts to formally incorporate feedback into emotion regulatory processes, Kalisch and colleagues (Kalisch, 2009; Paret et al., 2011) proposed an "implementation-maintenance" model of reappraisal. They argued that the effective regulation of emotion necessarily involves "continuous response adjustments" (Kalish, 2009, p. 1217) and that flexible emotion regulation requires operations that promote not only the implementation but also the maintenance of a chosen strategy. When feedback indicates the need to shift appraisals

in a more positive direction, for example, a reappraisal strategy may be initiated early in the regulation sequence and continuously adjusted to meet the desired aim. If the intended reappraisal is effective but the emotion is strong, maintenance of an effective regulatory strategy necessitates repeated efforts to continuously overwrite and renew the initial appraisal. When feedback monitoring indicates that initial reappraisal efforts have not been sufficiently successful, however, an additional, later stage of reappraisal is required (Paret et al., 2011).

The concept of feedback in our framework mirrors but also extends these processes to encompass longer periods of time, a wider range of regulatory strategies, and the possibility of switching from one regulatory strategy to another when the initially chosen strategy is perceived as ineffective. To illustrate these broader features, we return to one of the hypothetical situations discussed earlier. A woman has a fear of flying but due to her career duties she is required to fly regularly. She values her job and doesn't want her fear of flying to interfere with her career plans. Accordingly, she sets herself the goal of rising above her fears and managing her anxiety. On one particular occasion she is on an airplane nearing the end of the trip when there is a sudden and rather extreme burst of turbulence. A flight attendant makes a hurried announcement for the passengers to return to their seats and buckle their seat belts. Although the woman knows that such announcements are routine, she is sure she has sensed fear in the flight attendant's voice and she notices her own anxiety escalating. During the initial contextual sensitivity stage, she senses the need to regulate her anxiety. She is reminded of her goal to down-regulate her fears and decides that the best strategy would be to use some form of reappraisal. Cognitive reappraisal is within her repertoire of regulatory strategies and in the second, repertoire stage, she implements this strategy by telling herself that airplanes commonly encounter turbulence, that they rarely crash and that it is highly unlikely that anything serious will come of the situation she finds herself in. During the feedback stage, however, as she monitors her internal responses she

realizes that her fear is not abating. She feels tense and seems to react to each bump or shift of the plane. She notices that she has been constantly searching the faces and behavior of other passengers to detect any sign to corroborate her unease. Clearly her attempts at reappraisal have not been effective and she decides that a new course of action should be taken. Sheppes et al. (2012) showed that in high-intensity emotion situations, people tend to prefer disengagement strategies, such as distraction, over engagement strategies, like reappraisal. Thus, our passenger shifts from reappraisal to a more disengaging form of regulation. She attempts to distract herself by picking up the in-flight magazine and reading the ads and descriptions of various products. Although she continues to feel some distress, she observes that she is feeling better and thus she continues to actively use distraction.

Internal feedback. The ability to evaluate the efficacy of a regulatory strategy likely includes at least some sensitivity to internal states. Although there is surprisingly scant research on this assumption, supportive evidence was provided in a recent study by Füstös and colleagues (2013) that linked sensitivity to internal states with improved emotion regulation. They measured participant's accuracy in counting their heartbeats across three specified time periods, and then measured affective intensity and duration using EEG in an emotion induction task where participants were instructed to reappraise or maintain their emotional responses to the presented stimuli. Participants who were more accurate in detecting their heartbeat also demonstrated greater ability to down-regulate self-reported affect as well as neural activity.

Social feedback. Although feedback monitoring may be dominated by readouts of internal states, external feedback about the effectiveness of a regulatory strategy may also become salient. One crucial source of external feedback comes from interpersonal interactions. Corrective feedback from the social milieu has long been understood as a crucial element in the early development of the capacity for self-regulation (Cole, Michel, & Teti, 1994; Eisenberg &

Fabes, 1992; Ryan & Deci, 2000). In adults, interpersonal interactions exert a clear influence on both coping (Taylor & Armor, 1996; Thoits, 1986) and emotion regulation (Coan, Schaefer, & Davidson, 2006; Eisenberger, Lieberman, & Williams, 2003; Kross et al., 2011). Unfortunately, research on the role of social feedback in the *modification* of regulatory strategies is limited. There are however clear theoretical and empirical bases to suggest promising avenues for future research. Social functional accounts of emotion, for example, emphasize the role that emotional expressions play not only in communicating but also in influencing the behavior of others (Keltner & Haidt, 1999). Similarly, from an organizational psychology perspective, Côté (2005) proposed a social interaction model of emotion regulation in which emotional communication exerts multiple, reciprocal feedback loops. In other words, senders' emotional expressions influence and produce responses in receivers, and the responses of receivers in turn reciprocally influence the experience and behavior of the sender. This type of elaborate feedback suggests that the situational context may actually change during the regulation cycle and thus a corresponding need to re-assess the situational demands and opportunities, as represented in the uppermost arrow of Figure 1.

In a compelling application of the social functional perspective, Beer et al. (2003) examined the role of self-conscious emotions (e.g., embarrassment) in various social tasks by comparing healthy participants with a group of patients that had suffered damage to the orbitofrontal cortex. Orbitofrontal patients have intact language, memory and sensory processing, but exhibit difficulties regulating social interactions. In Beer et al.'s (2003) study, the orbitofrontal patients also appeared to be unable to use social feedback in regulating their emotions (Beer et al., 2003).

Sensitivity to social feedback may also help determine the relative social costs or social benefits of a given regulatory strategy. This kind of feedback would necessarily include

assessment of cultural variations. In a representative study on the social costs of expressive suppression, for example, Butler and colleagues (2003) examined dyadic interactions where unacquainted partners were first shown an unsettling film (e.g., graphic footage of the aftermath of the nuclear attack on Japan during World War II) and then asked to discuss their thoughts and feelings about the film. In different conditions, one of the partners in the dyad was surreptitiously instructed to suppress all outward signs of emotion, to engage in cognitive reappraisal, or to behave naturally. Compared to the other conditions, partners who engaged in expressive suppression were more distracted and less responsive during the conversation, and their partners reported less rapport, less willingness to become further acquainted, and had an increased cardiovascular response. Butler, Lee and Gross (2007) later showed however that these kinds of social costs vary by cultural values. More specifically, partners who showed strong negative reactions to suppression held predominantly Western-European cultural values whereas bi-cultural partners with less of a Western-European identity were less likely to experience negative reactions to a partner's use of suppression.

Changing strategy. Sensitivity to internal or social feedback will sometimes indicate the need for a change in regulatory strategy. A recent questionnaire study by Kato (2012) provided support for this aspect of the feedback component as applied to coping. Kato (2012) defined this aspect of flexibility, in line with the responsiveness to feedback component, as "the ability to discontinue an ineffective coping strategy and produce and implement an alternative coping strategy" (p. 262). Based on factor analyses of questionnaire data, she identified two key dimensions of feedback responsiveness compatible to those we described above. One dimension, comprising an *evaluation coping* subscale, involves sensitivity to feedback about the efficacy of coping efforts (e.g., "I am aware of how successful or unsuccessful my attempts to cope with stress have been"); a second dimension, comprising an *adaptive coping* subscale, involves the

willingness to implement alternative coping strategies (e.g., "When a stressful situation has not improved, I try to think of other ways to cope with it"). Both dimensions of feedback responsiveness predicted high scores on an insight problem-solving task suggestive of flexible thinking and both dimensions were associated with better mental health in college and community samples.

Avenues for future research. Together these findings beg a number of intriguing questions. For example, might the social costs of emotional suppression be reduced during the feedback stage if a person is sensitive to the responses suppression evokes in others and subsequently switches to another regulatory strategy? Are the social costs of suppression negligible if suppressive behavior is modulated across situations? Conversely, does inflexibility across situations exacerbate the social costs of expressive suppression?

A related point pertains to possible variations in feedback across different types of regulatory strategies. As Aspinwall and Taylor (1997) observed, more active or engaging forms of coping are likely to yield more usable feedback compared to avoidant or disengaging forms of coping. Might the same be true of emotion regulation strategies? Because disengagement is more often preferred in high-intensity situations (Sheppes et al., 2012), we might ask whether high-intensity situations are less amenable to feedback monitoring. In a related vein, a crucial but as yet only minimally addressed issue pertains to the extent that accurate monitoring of feedback requires conscious awareness, or whether, like many aspects of emotion regulation (Williams et al., 2009), feedback monitoring may function effectively at the periphery of, or even outside, conscious awareness. Research on these and other questions will greatly enhance our understanding of this important but as yet under-researched aspect of regulatory flexibility.

Moving Forward

In the sections above, we reviewed research and theory from the literatures on coping and

emotion regulation in relation to a broad heuristic framework on individual differences in regulatory flexibility. We centered our review on three sequential components. Although the research we considered was consistent with this framework, we also highlighted the limitations of the evidence and a range of important questions to guide future research. In this final section, we explore two issues in greater detail: how the components might relate to each other and how to best conceptualize and measure these components over the course of time.

Relations between components and adjustment

One assumption inherent in our perspective is that abilities in each of the three components of flexibility should be to some extent correlated. Although relatively little research has examined interrelations among the components, a series of studies by Cheng and colleagues (Cheng, 2003; Cheng et al., 2000; Cheng & Cheung, 2005), discussed earlier, showed that context sensitivity, measured as discriminative facility, was positively correlated with the flexible use of coping strategies. It seems likely also that certain factors may be associated with and contribute to more than one of the three components. For example, sensitivity to bodily signals appears to play an important role in sensitivity to feedback (Füstös et al., 2013), but may also contribute to a person's sensitivity to context (Herbert, Polatos, & Schandry, 2007). More research is imperative to identify distinct versus shared individual differences in these areas.

A related assumption is that flexible self-regulation, and in turn healthy adjustment, is maximized by the ability to utilize each of the three components we considered. By adopting the context-variability approach to measurement, one might presume that the more a person can adjust both within- and between-contexts, the better able she will adapt. It is worth noting, however, that although we assume an overall relationship among these abilities, it is probable that there also exist patterns of variability across components. In this case, sub-groups of individuals might be better at reading emotion-evoking signals, for example, but less well-

equipped to address the particular coping demands and opportunities afforded by specific situations. Likewise, other subgroups may be extremely gifted at incorporating feedback but less adept at assessing context.

We anticipate that the differences between the three components of flexibility may be useful in understanding heterogeneity in the various parameters of adjustment that follow the onset of a stressor (Bonanno, Mancini, & Westphal, 2011; Galatzer-Levy et al., 2011). For example, because context sensitivity is integral in the initial steps of flexible responding, we might theorize that individual differences in this component will be most closely linked with initial levels of distress after a stress-inducing event (e.g., the intercept parameter). In comparison, sensitivity to feedback becomes relevant after an original regulation strategy has been employed and consequently will likely be most predictive of later levels of distress (e.g. variability in the slope of adjustment, or the rate by which distress decreases). Because both of these components are reliant on the availability of an effective strategy, a person's repertoire size may therefore predict their overall (mean) psychological distress across all time points. Tests for these and other temporal hypotheses are well-suited for latent growth modeling techniques, but require longitudinal designs that utilize at least three sampling points. To date, relatively little research on flexibility has met this criterion.

It is also worth considering whether there is an upper limit to flexible responding. In other words, might too much sensitivity to context be maladaptive, and at its extreme take the form of erraticism? Indeed, the relationship between flexibility and adjustment may not be linear but rather curvilinear. A related consideration that warrants further study is the potential resource costs of flexibility. Business models often attribute economic costs for investing in infrastructures that can respond quickly in the event of changing demands (Sanchez, 1997). It stands to reason that the psychological infrastructure permitting variability in coping and other

self-regulatory strategies may also be subject to tolls in cognitive, social, or other domains of functioning.

Flexibility and Change: The Personality Paradox Revisited

Another key assumption underlying our conceptualization is that both contextual demands and opportunities and the most effective means of self-regulation in response to those demands and opportunities are generally measureable. We considered earlier that of course in real-world situations this information is not always readily apparent, in which case the most adaptive response becomes a best guess among plausible alternatives that can be corrected, as needed, with feedback. However, from a measurement standpoint, it is possible to create less ambiguous test situations. The rich body of theory and research on the contextual antecedents of specific emotions, for example, makes it possible to develop contextual stimuli with relatively obvious emotion-evoking characteristics (e.g., loss stimuli suggest the primacy of sadness, whereas stimuli with uncertain but serious threat suggests the primacy of fear). Similarly, as we considered it is also possible to create contextual scenarios in which the most appropriate coping or emotion regulation strategy can be determined with a reasonable degree of confidence.

It is worth considering, however, that there may be unique subgroups for which the most efficacious match between context and behavior is different than for other subgroups. Most people dislike the experience of worry for example and would seek to down-regulate or otherwise minimize such a reaction. Intriguingly, however, individuals high in neuroticism have been found to prefer to increase or up-regulate the experience of worry prior to taking a difficult test (Tamir, 2005). Moreover, for these individuals, worry actually seems to enhance test performance. Yet, it is difficult to reconcile the apparent advantage these propensities might hold for neurotic individuals with the more general deficits associated with that disposition. High neuroticism individuals are by definition emotionally unstable, tend to experience greater distress,

to be more reactive to stressors, and to have more long-term difficulties than other individuals (Ormel & Wohlfarth, 1991; Suls, Green, & Hills, 1998).

Until future research becomes available that might untangle these issues, it is still possible to measure flexibility in a more general sense, albeit with suitable cautions in place. The framework we have advanced in this article conceptualizes flexibility in terms of abilities: the ability to read the situational context, the ability to utilize a repertoire of regulatory strategies, and the ability to monitor feedback and maintain or readjust regulatory strategies as needed. Our emphasis on abilities in turn suggests that flexibility has a trait-like quality and, as we discussed earlier, there is some evidence to support this supposition (e.g., Westphal et al., 2010). Inherent in the definition of flexibility, however, is the assumption that regulatory strategies will necessarily vary across situations. In this context, then, the question becomes "How do we measure a trait that assumes people act in a non trait-like manner?" This enterprise diverges from the traditional aim of measurement in psychological research, which has conventionally sought to predict a specific behavior that is stable across situations and time. In their seminal manuscript re-conceptualizing personality structure through the lens of situational effects, Mischel and Shoda (1995) provided the groundwork for measuring individual differences in predictable patterns of behavior across contexts. The construct of flexibility builds upon this framework but, importantly, places less emphasis on predicting *specific* behavior within individuals in similar situations and more on the *variation of* behavior within individuals in a manner that is responsive to the shifting context. Returning to the subgroup of people high in neuroticism, then, we would observe that although they may show unique propensities in performance situations, they generally fail to modulate their regulatory behavior across situations (Suls, Green, & Hills, 1998) and are generally less flexible than other people (Latzman & Masuda, 2013).

Given the limits of current methodological approaches to flexibility, such determinations

must be considered tentative. The most common approach for measuring repertoire flexibility, for example, assigns self-regulatory strategies into two or more categories and then calculates parity scores between these categories. This resultant score however presupposes that categories are well-defined and operationally distinct from each other, which is not currently the case in the coping literature (Skinner, Edge, Altman, & Sherwood, 2003). Additionally, cultural frames are likely to influence both the context in which regulation occurs (e.g., Masuda et al., 2008) and the meaning of the regulation strategy (e.g., Mauss & Butler, 2010). Further, it is important to consider that when regulation moves beyond the laboratory, the real-word consequences of any particular strategy may vary even more dramatically across contexts (Aldao & Nolen-Hoeksema, 2012b). Laboratory studies have consistently linked emotional suppression with memory deficits, for example, and recently with reduced hippocampal activity (Binder et al., 2012). However, in some contexts, such as exposure to highly aversive or potentially traumatic stress, transient emotional suppression and reduced hippocampal activity may be highly adaptive because they would likely constrain the development of intrusive trauma memories (Binder et al., 2012; de Quervain, Aerni, Schelling, & Roozendal, 2009). Although flexibility research does not assume that one regulatory strategy is inherently superior, this line of inquiry will benefit as researchers move toward more theoretically, methodologically, and culturally diverse approaches to coping and emotion regulation.

Conclusion

As emotion and coping research continues to progress, it has become clear that the utility of any given stress response is rarely static. Flexibly adapting one's behavior across different stressor situations is equally if not more important than the ability to use any single strategy. Research and theory on the construct of flexibility is nascent and conceptually diverse. The research we reviewed in this article represents our attempt to organize this literature and to

operationalize the construct into three core, sequential components: the sensitivity to the situational context, the ability to utilize a diverse repertoire of regulatory strategies, and the ability to monitor feedback about the relative efficacy of a chosen regulatory strategy and maintain or adjust regulation as needed. As we reviewed above, a great number of questions await further research. Although numerous measurement innovations have already been made, it remains crucial to expand this work across disciplines (e.g., experimental paradigms that intersect behavior and neuroscience). As progress is made along these lines of inquiry and the construct of flexibility is further developed, we anticipate that it will prove increasingly capable of accounting for the heterogeneity observed within individuals responding to life's many stressors.

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Appendix A: Glossary of Strategies

We referred to a variety of different types of regulatory strategies in this article. Below we briefly define some of the basic strategies and categories of strategies that were not elaborated on in the text, along with brief examples of their instantiation. Although these strategies can be collected under the broader rubrics of "emotion regulation" and "coping," it should be noted that in many cases the terms and examples are not mutually exclusive.

Specific emotion regulation strategies

Reappraisal – A specific regulatory strategy that changes the way a stimulus or situation is perceived, typically to decrease emotional impact. One instantiation is to reinterpret an emotional event in more objective terms. For example, minimizing an angry response to a rude and hostile person by reasoning that the person is suffering and having a bad day.

Suppression - A specific regulatory strategy that inhibits the experience or expression of emotion. For example, feeling distressed or embarrassed in a pubic situation and trying not to show those feelings.

Distraction – A specific regulatory strategy that blocks emotional processing at an early stage before more elaborate processing is possible. For example, looking away from an aversive image or thinking about something emotionally neutral, such as one's next appointment or a grocery list.

Categories of emotion regulation strategies

Up-Regulation –Any strategy that augments or enhances the emotional reaction

Down-Regulation – Any strategy that reduces or detracts from the emotional reaction

Attentional Deployment – Strategies in which attention is directed toward or away from specific aspects of a situation before a fully formulated emotional response has occurred (e.g., distraction).

Cognitive Change – Strategies that alter the interpretation of a situation to modify its emotional impact (e.g., reappraisal).

Response Modulation – Strategies that change the experience or expression of emotions after the emotional responses are generated (e.g., suppression).

Disengagement – Strategies in which incoming emotional information is reduced or blocked at an early attentional selection processing phase before it can undergo more elaborate processing (e.g., distraction).

Engagement– Strategies in which incoming emotional information is modulated at a later semantic meaning-processing phase (e.g., suppression, reappraisal).

Categories of Coping Strategies

Problem-Focused Coping – Strategies that aim to modify the situational factors that give rise to distress. Examples include creating options to solve a problem, identifying the pros and cons of different options, and carrying out the behavior of addressing the problem

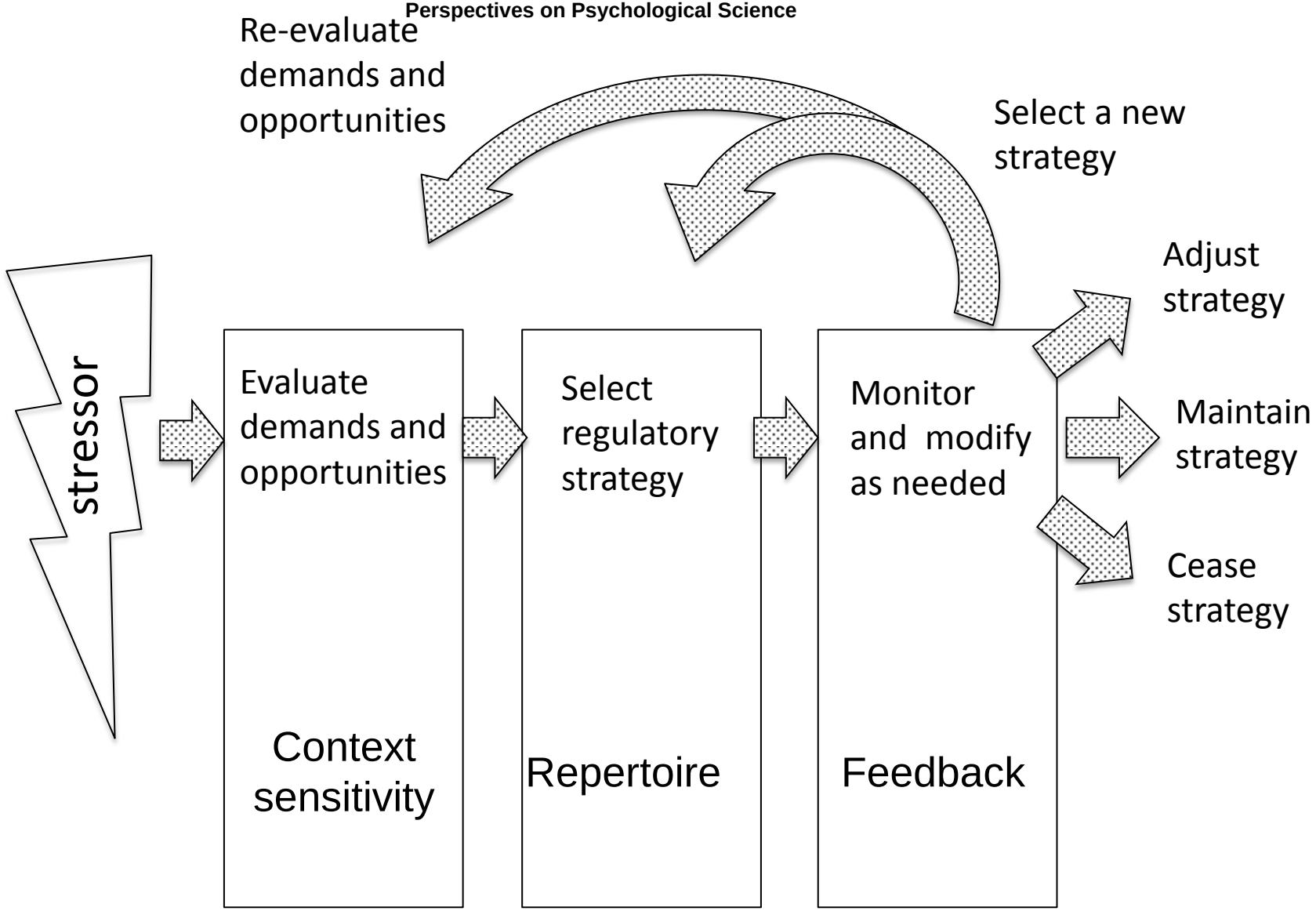
Emotion-Focused Coping – Strategies that aim to manage personal reactions to a distressing situation. Examples include seeking emotional support, self-blame, and wishful thinking.

Loss-Oriented Coping – Strategies concentrating on processing the primary aspects of the experienced bereavement. Examples include thinking about and talking to the deceased, looking at old photos, or crying about the death

Restoration-Oriented Coping – Strategies concentrating on the secondary aspects of bereavement. Examples include mastering the tasks that the deceased had undertaken, engaging in new activities, and developing a new identity.

FIGURE CAPTION

Figure 1. Three sequential components of regulatory flexibility and their corresponding abilities


Re-evaluate demands and opportunities
Select a new strategy
Adjust strategy
stressor
Evaluate demands and opportunities
Select regulatory strategy
Monitor and modify as needed
Maintain strategy
Cease strategy
Context sensitivity
Repertoire
Feedback