

Expressive Flexibility

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Previous research has examined the consequences of either expressing or suppressing emotion using between-subjects designs. However, emotion theorists have argued that adaptation depends not so much on one regulatory process but rather on the ability to flexibly regulate emotion in accord with situational demands. To test this idea, Bonanno, Papa, Lalande, Westphal, and Coifman (2004) developed a within-subjects experimental paradigm to measure expressive flexibility (EF) and showed that EF predicted better self-reported adjustment over a 2-year period. The current investigation extends this research by (1) demonstrating the stability of EF across a 3-year period, (2) replicating the association between EF and positive adjustment using a more objective measure of adjustment (obtained from participants' close friends rather than based on self-report), and (3) by showing that the positive relation between EF and adjustment was particularly salient in the context of high levels of cumulative life stress when EF was measured under conditions of immediate threat (presence of a subliminal threat prime).

Keywords: flexibility, emotion regulation, expression, suppression, stress, resilience

Is it better to express or conceal emotion? Historically, the psychological literature has emphasized salutary aspects of emotional expression, and a large body of contemporary research and theory continues to support this view (Pennebaker, 1990, 1993, 1995, 1997). In some instances, however, inhibition or suppression of emotion is also adaptive (Bonanno, 2001; Gross, 1998b), suggesting that both up-regulating and down-regulating emotion is important (Bonanno, 2001; Consedine, Magai, & Bonanno, 2002; Gross, 1999; Parrott, 1993; Westphal & Bonanno, 2004). In the specific domain of emotional expression, Bonanno, Papa, Lalande, Westphal, and Coifman (2004) recently developed a within-subjects experimental paradigm to measure expressive flexibility (EF), defined as the ability to both enhance and suppress emotion. The finding that EF predicted better long-term psychological adjustment supported the idea that flexible regulation of emotional expression in accord with situational demands is more important to adjustment than expression or suppression per se. The current investigation was designed to extend this research by evaluating the stability of EF across a 3-year period, testing whether high EF predicts better outcome using a more objective measure of adjustment, and examining whether the relation between EF and adjustment is moderated by the presence of immediate threat and level of cumulative life stress.

Enhancing and Suppressing the Expression of Emotion

It is widely acknowledged that facial displays of emotion serve many important interpersonal and intrapersonal functions such as

signaling behavioral intentions (Izard, 1991; Plutchik, 1980, 1982; Scherer, 1982), initiating and maintaining social interactions (Darwin, 1872; Ekman, 1993; Keltner, 1995), regulating and communicating internal states (Ekman & Davidson, 1993; Izard, 1990; Zajonc, Murphy, & Inglehart, 1989), and shaping social exchanges by generating similar (Hatfield, Cacioppo, & Rapson, 1994) or complementary (Eibl-Eibesfeldt, 1989; Keltner & Kring, 1998) emotional experiences in dyadic partners.

By contrast, habitual suppression of emotion and expressive inhibition have been associated with pervasive and long-term emotional, social, cognitive, and health costs. A series of studies by Gross and John (2003) indicated that individuals who report high use of expressive suppression tend to experience less positive and more negative emotion, report decreased well-being, and receive lower peer ratings of closeness and likability. Experimental studies have demonstrated negative effects of suppression by showing participants an emotion-eliciting film and instructing them to behave "in such a way that a person watching you would not know you were feeling anything" (e.g., Gross & Levenson, 1993). Compared with a no-regulation control condition, the suppression instruction increased sympathetic nervous system activity (Gross, 1998a; Gross & Levenson, 1993, 1997) and weakened memory for emotional details (Richards & Gross, 2000). When measured in the context of social interactions, suppression decreased memory for conversation utterances while increasing memory for emotional reactions (Richards, Butler, & Gross, 2003), and increased blood pressure, disrupted communication, reduced rapport, and inhibited relationship formation in dyadic partners (Butler et al., 2003).

Although these findings appear to favor expression over suppression, there is also evidence for the adaptive benefits of suppressing or down-regulating emotional expression (Gross & Munoz, 1995; Keltner, Kring, & Bonanno, 1999; Kennedy-Moore & Watson, 2001). For example, reduced display of negative emotions in adverse contexts predicts better long-term functioning (Bonanno & Keltner, 1997), helps maintain and expand social networks

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(Coyne, 1976; Gottlieb, 1991), and facilitates close relationships (Levenson & Gottman, 1983). Complimentarily, chronic expression of negative emotion, particularly anger, is a risk factor in cardiovascular disease (Adler & Matthews, 1994). A recent study of survivors of childhood sexual abuse (Bonanno et al., 2007) showed that in certain contexts, even the expressions of positive emotion can be maladaptive.

Expressive Flexibility (EF)

Taken together, these data suggest that the ability to flexibly modulate emotional expressions in accordance with situational demands (EF) should be more important for adjustment than reliance on any particular expressive regulation strategy. Consistent with this hypothesis, Bonanno et al. (2004) found that EF ability predicted decreased distress over a 2-year period using a controlled experimental paradigm. This paradigm was developed by adapting procedures used by Gross and Levenson (1993) to measure emotional suppression by including two additional conditions: an expressive enhancement condition, in which participants were asked to enhance their emotional expressions in response to affective images so as to communicate their internal state as clearly as possible to a (fictional) observer viewing them in an adjacent room, and a baseline control condition, in which participants were told that the video monitor was switched off and they should behave as usual. A distinguishing feature of the EF paradigm was that comparisons across conditions were carried out within-subjects. This made it possible to measure each participant's expression and suppression ability separately as well as assess the ability to engage in both forms of expressive-regulatory behavior.

The Current Investigation

Although the preliminary evidence using the EF paradigm is promising, a number of important questions remain. The current investigation was designed to advance this research in three ways. First, we examined whether EF was stable over time. Because EF is conceptualized as a regulatory *ability* that varies across individuals, it stands to reason that individual differences in EF performance should evidence some trait-like stability over time. To address this issue, we invited the same participants used in the Bonanno et al. (2004) study back to the laboratory 3 years after the original study. Approximately half of these participants repeated an almost identical version of the EF experiment that provided the data used to establish test-retest reliability. The other half engaged in a modified version of the EF experiment that was designed to test context-dependent effects of EF on adjustment, as we describe below.

A second question we considered was whether EF ability and its adaptive consequences might vary depending on immediate threat context and cumulative life stress. Functional approaches to emotion posit that emotions evolved to help solve problems associated with recurrent environmental threats and demands (Ekman, 1993; Lazarus, 1991; Tooby & Cosmides, 1990). These functions are assumed to be context bound (Cole, Michel, & Teti, 1994, p. 84), and suggest that the salutary impact of EF on adjustment may be particularly salient in the presence of immediate threat cues or high levels of cumulative life stress.

To examine the influence of immediate threat in the current investigation, we administered a between-subjects threat manipulation in which subliminal word primes were briefly presented prior to the onset of each picture stimulus. For half of the participants, the subliminal prime was a social threat word, *separation*, and for the other half the subliminal prime was a comparable neutral word, *cognition*. Previous research (Mikulincer, Gillath, & Shaver, 2002; Seivert & Bonanno, 2006) has shown that the repeated subliminal presentation of threatening words (e.g., *separation*, *death*, *failure*) activates attentional components of social threat response systems. We chose a *social* threat word because emotional expressive behavior is inherently social. By comparing associations between EF and adjustment in the threat and neutral prime conditions, we aimed to examine whether EF is particularly relevant to adjustment when measured in the context of immediate threat.

We also examined the impact of cumulative life stress. The Bonanno et al. (2004) study measured EF scores among students who had begun college in New York City just prior to the September 11 terrorist attacks. EF performance among these students predicted better long-term adjustment over the ensuing 2 years. However, no additional information was available in the 2004 study on other potentially stressful events. This raises the question of whether the positive relation between EF and adjustment observed in the wake of a discrete and uniquely disturbing life event such as 9/11 would also be evident in relation to cumulative life stress. To address this issue, we asked participants to record the occurrence of recent significant life events on a weekly basis for 1 year, using a secure Internet checklist. This weekly diaries provided a measure of cumulative life stress that encompassed a wide range of potential stressors, including high-impact events such as rape or bereavement, as well as more mundane stressors that may pose a challenge to a participant's emotional equilibrium.

Third, we extended previous evidence for the importance of EF in adjustment by refining our measures of adjustment and EF. Bonanno et al. (2004) demonstrated that EF predicted better adjustment using a self-report measure of general distress. Reliance on self-report measures, however, leaves open the possibility that findings may have been influenced by faulty or distorted retrospective memory, self-presentation biases, and state-dependent recall. Given the intrinsically social nature of emotional expression, we reasoned that using anonymous ratings of participants' adjustment obtained from their close friends provides a more ecologically valid way to establish the adaptive value of EF as well as allowing us to test whether the relation between EF and adjustment would be stable across different sources of information.

Regarding our modification of the EF measure; in the 2004 report, EF was measured by summing scores on the enhancement and suppression tasks. To address the possibility that high sum flexibility may be the result of scoring exceptionally high on either enhancement or suppression ability, but not necessarily both, Bonanno et al. (2004) created an *expressive polarity score* representing the difference between enhancement and suppression scores. Results showed that high ability in only *one* form of expressive regulation (i.e., expression *or* suppression) was *not* predictive of better adjustment. In the present study, we dealt with the potential ambiguity of the original EF score psychometrically (see methods). In the present article, we refer to this new variable as

balanced expressive flexibility and distinguish it from the *sum expressive flexibility* variable used in the 2004 study.

Method

Participants and Procedures

One hundred six undergraduates (36 men; 70 women) participated in the present study as part of a larger longitudinal project investigating college student adjustment. Participants in the present study were required to complete an individually administered expressive regulation experiment during their fourth year of college. For 71 participants (20 male; 51 female), similar data were available from an administration of the Experiment 3 years prior. We also collected an Internet-based self-report measure of cumulative life stress on a weekly basis throughout the fourth year of the study. Because of expense and logistics, these data were only collected from 50 participants (18 men; 32 women). Finally, participant adjustment was rated anonymously by friends during the fourth year. Fifty participants (18 men; 32 women) distributed rating forms to two close friends whom they felt knew them well and with whom they had relatively consistent contact. Friends completed the ratings and mailed them directly to the researchers (for a similar procedure see Bonanno, Moskowitz, Papa, & Folkman, 2005).

Expressive Regulation Paradigm

Participants were seated before a desktop computer and filmed from a webcam positioned beside the computer. They were instructed in how to interact with software that displayed blocked sequences of 5 digitized picture stimuli selected from the International Affective Picture System (Lang, Bradley, & Cuthbert, 1995). Stimuli were balanced across blocks for valence and arousal ratings based on college student norms (Lang et al., 1995). Within each block, individual stimuli were presented for 10 s with 4 s between stimuli. Before each stimulus, participants were presented with a 500-ms fixation point X, followed by a 26-ms word prime and a 500-ms backward pattern mask XXX. Participants were randomly assigned to one of two word prime conditions. Approximately half ($N = 51$) received a neutral word prime (*cognition*) and half ($N = 55$) a word social threat prime (*separation*). Seventy-two participants in the current study had also participated in an administration of the EF experiment 3 years prior (see Bonanno et al., 2004). Of these, 32 were randomly assigned to the neutral word prime condition and 40 to the threat prime condition.

For practice, participants viewed randomly presented blocks of positive or negative stimuli and following each block, rated the degree that they felt *negative emotion* (e.g., *anger, revulsion, sadness, distress*) by typing a number between 1 (*no negative emotion*) and 7 (*extreme negative emotion*) and then rated *positive emotion* (e.g., *happiness, joy, amusement, interest*) using a similar scale. Following practice trials, participants were told: (a) there was another person in the adjacent room who would also take part in the experiment (another participant was not actually present); (b) they would not see the other person, but the other person would sometimes be able to view them on a monitor; (c) they would always be informed when the monitor was on and when it was off; (d) the other person could not hear them or see the picture stimuli

but would attempt to guess their emotions for each block of stimuli; (e) when the experiment began, the computer would (1) sometimes ask them to enhance their expression of emotion so the observing person could more easily guess what they were feeling, (2) sometimes ask them to suppress their expression of emotion so the observing person could not easily guess what they were feeling, or (3) sometimes inform them that the monitor was turned off and that the observing person would be unable to see them, in which case they should behave as they would normally. Participants were then shown the three instruction paragraphs describing each condition (for details, see Bonanno et al., 2004), and informed that one of the instructions would always precede each block of stimuli, and that the emotion ratings would always follow each block of stimuli. Twelve blocks of experimental trials (enhancement, suppression, or control instruction using positive or negative stimuli; with each combination presented twice) were then presented in random order.

Four masters level psychology students who were blind to the goals and hypotheses of the study rated participants' emotional expression for each block of images. Observers used the same 7-point Likert scales as those used by the participants. Observers never saw the emotional stimuli and had no knowledge of the participant's instructions for any given block. Observer agreement was high (intraclass correlation coefficient [ICC] = .88) and did not differ significantly across blocks or adjustment group. Final ratings of expressed emotion were calculated by averaging across the four raters.

Expressive enhancement ability was obtained by subtracting mean expression of emotion in the control condition from mean expression of emotion in the enhancement condition. *Expressive suppression ability* was obtained by subtracting mean expression of emotion in the suppression condition from mean expression of emotion in the control condition. As in our previous study, enhancement and suppression ability were significantly inversely correlated ($r = -.46, p < .001$). We constructed an EF variable using three steps: (1) we calculated *sum EF* by adding the enhancement and suppression scores; (2) we calculated *expressive polarity* by taking the absolute value of the difference between the enhancement and suppression scores; (3) we calculated *balanced expressive flexibility* by subtracting the polarity score from the sum flexibility score. This third step creates a clearer marker of expressive flexibility than the sum expressive flexibility score. High balanced expressive flexibility scores represent extreme but opposite response tendencies. Extreme scores in one form of regulation (i.e., enhancement or suppression) results in lower balance scores (Bonanno, Notarius, Gunzerath, Keltner, & Horowitz, 1998). Throughout the remainder of the article, we will refer to this balanced expressive flexibility score as EF.

Cumulative Life Stress

Cumulative life stress was measured with a weekly Internet-based checklist of 53 potentially stressful life events that ranged from relatively mundane stressors to highly aversive events. Examples included "Difficulties with personal finances," "Significant change in academic demands (workload)," "Death of someone close to you," "Physical injury or serious illness," and "You were robbed or mugged." Every week for the duration of the study, participants were asked to access a web site and log on with an

anonymous ID and password. They were then asked whether or not they had experienced any of the 53 events during the past week. We calculated and normalized the sum of stressful life events that each participant endorsed over the entire fourth year of the study.

Friend Ratings of Adjustment

Adjustment was assessed by ratings from two close friends. Each friend-informant was asked to compare the participant's usual adjustment to the average person of the same age and gender using a 7-point scale ranging from 1 (*much worse than the average person*) to 7 (*much better than the average person*). Ratings were made for 5 dimensions: mental health and well-being, physical health, quality of social interactions, ability to accomplish goals, and coping ability (e.g., "My friend's mental health and well-being is usually. . ."). Friends were also asked to rate the participant's current level of adjustment in comparison to his or her usual level for the same five dimensions, using a 7-point scale ranging from 1 (*much worse than usual*) to 7 (*much better than usual*). We created an overall score of friend rated adjustment by summing the 10 continuously rated items across the two friend ratings ($\alpha = .90$).

Results

Manipulation Check

Preliminary analyses of subjective-rated emotion were consistent with the valence of stimuli. Participants rated the positive valence stimuli as significantly more positive than negative across all of the experimental conditions: enhancement, $t(105) = 23.15$, $p < .001$; suppression, $t(105) = 20.90$, $p < .001$; and control, $t(105) = 24.30$, $p < .001$. Likewise, they rated negative valence stimuli as significantly more negative than positive across all conditions: enhancement, $t(105) = 31.99$, $p < .001$; suppression, $t(105) = 31.12$, $p < .001$; and control, $t(105) = 29.81$, $p < .001$. Because subjective ratings not matching the valence of the stimuli (e.g., positive ratings of negative stimuli) were very low across conditions ($M = 1.30$, $SD = .32$) and were not hypothesized to have any meaningful effects, they were excluded from subsequent analyses.¹

Analyses of emotion ratings also validated the manipulation of expressive regulation strategies. As anticipated, a repeated measures analysis of variance revealed a significant 2-way interaction for rating source (participant, observer) and expressive regulation condition (enhancement, suppression, control), $F(1.91, 199.11) = 374.70$, $p < .001$. A graph of the interaction (see Figure 1) suggests that, similar to Bonanno et al. (2004), the experimental conditions influenced observers' ratings of expressed emotion in intended directions and had little or no impact on subjective ratings of emotion. Consistent with this impression, Tukey pairwise comparisons ($p < .001$) indicated that observer-ratings of emotion were significantly greater in the enhancement condition ($M = 5.12$, $SD = .96$) than the control condition ($M = 2.92$, $SD = .99$), and significantly lower in the suppression condition ($M = 1.80$, $SD = .65$) than the control condition.

Is Expressive Flexibility Stable Over Time?

Our first aim was to examine the stability of EF across a 3-year period. We correlated scores for the new and old EF variables (i.e.,

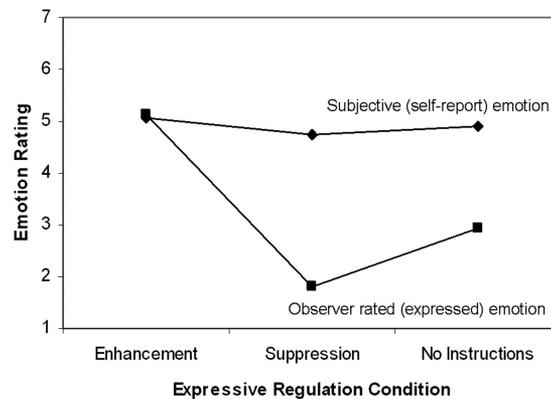


Figure 1. Participants' ratings of their own (subjective) emotion and observers' ratings of emotion expressed by participants in the three expressive-regulation conditions. Higher ratings indicate greater emotion.

sum EF and balanced EF) and EF subcomponent scores (enhancement and suppression ability) obtained at Time 1 with the corresponding scores obtained at Time 2 in the neutral prime condition. We only used scores from the neutral prime condition since this condition closely matched the procedures of the original experiment conducted at Time 1. Results showed that EF components were moderately to highly correlated across time: expressive enhancement ability ($r = .44$, $p = .01$), expressive suppression ability ($r = .44$, $p = .01$), sum EF ($r = .62$, $p < .001$), expressive polarity ($r = .40$, $p < .05$), and balanced EF ($r = .45$, $p = .01$).

Do Threat Context and Cumulative Life Stress Moderate the Relation Between Expressive Flexibility and Peer-Rated Adjustment?

Our second and third aims were to further test the hypothesis that EF would be most relevant to adjustment in potentially threatening or stressful contexts (Bonanno, 2005) by examining the influence of an immediate threat and cumulative life stress (Aim 2), and by using friend-rated adjustment rather than self-reported distress as the dependent variable (Aim 3). Specifically, we examined whether EF interacted with cumulative life stress in predicting adjustment, and whether EF was more strongly associated with adjustment when measured under conditions of immediate threat (threat prime vs. neutral prime). Regression models to test these effects using centered variables are summarized in Table 1.

Expressive enhancement and suppression. We first examined how expressive enhancement ability and suppression ability independently related to adjustment. The first analysis (Model 1) focused on enhancement ability. We regressed adjustment on enhancement ability, the number of stressful life events, context prime (threat prime vs. neutral prime), and all relevant interactions. Suppression ability was included in the model as a control vari-

¹ Bonanno et al. (2004) reported that the valence of the stimuli did not influence any of the primary effects and therefore emotion ratings were collapsed across valence. In the current investigation, preliminary analyses led to the same conclusion and therefore we again collapsed across valence in creating the various expressive regulation scores.

Table 1
Regression Analyses Predicting Friend-Rated Adjustment From Expressive Regulation Abilities, Cumulative Life Stress, and Prime (N = 50)

Variable	B	SE	β
Model 1			
Suppression (control variable)	-.30*	.13	-.35
Enhancement	-.14	.11	-.22
Stress	-.61**	.23	-.45
Prime	.57	.38	.21
Enhancement × Stress	.23†	.12	.33
Enhancement × Prime	-.04	.18	-.05
Stress × Prime	.85*	.40	.37
Enhancement × Stress × Prime	-.55**	.20	-.53
Model 2			
Enhancement (control variable)	-.13	.09	-.21
Suppression	-.12	.16	-.14
Stress	-.43	.28	-.32
Prime	.15	.37	.05
Suppression × Stress	.11	.17	.13
Suppression × Prime	-.34	.22	-.27
Stress × Prime	.84*	.42	.36
Suppression × Stress × Prime	.61*	.30	.33
Model 3			
Expressive Flexibility	.03	.09	.06
Stress	-.43†	.25	-.31
Prime	.07	.37	.02
Expressive Flexibility × Stress	.05	.09	.09
Expressive Flexibility × Prime	-.24	.15	-.26
Stress × Prime	.46	.40	.20
Expressive Flexibility × Stress × Prime	.35*	.17	.33

Note. Model 1: $R^2 = .33$, $F(8, 41) = 2.48^*$. Model 2: $R^2 = .37$, $F(8, 41) = 3.06^{**}$. Model 3: $R^2 = .32$, $F(7, 42) = 2.78^*$.
† $p \leq .10$. * $p < .05$. ** $p \leq .01$.

able. The second analysis (Model 2) repeated this procedure for suppression ability, and included enhancement ability as the control variable. Both models were significant. Of note, in each model the anticipated 3-way interaction of EF ability × Stress × Prime was significant. *T* tests of simple slopes showed that participants in the neutral condition who demonstrated low expressive enhancement had worse adjustment when exposed to high cumulative life stress, $t(41) = -3.45$, $p \leq .001$. Participants in the neutral condition with low on expressive suppression ability also exhibited worse adjustment when exposed to high cumulative life stress, $t(41) = -2.45$, $p < .02$. For participants in the threat condition, cumulative life stress and emotion regulation did not interact to predict adjustment ($p > .10$). However, participants in the threat condition who demonstrated low suppression ability evidenced worse adjustment when exposed to high cumulative life stress, $t(41) = -2.10$, $p < .05$. Unexpectedly, participants with high suppression ability in the threat condition received higher adjustment ratings from their friends if they had high cumulative life stress, $t(41) = 2.63$, $p \leq .01$.

EF. To more explicitly test the EF hypothesis, we regressed friend-rated adjustment on the balanced EF score, cumulative life stress, priming condition, and all relevant interactions. This model was significant, $F(7, 42) = 2.78$, $p < .05$, and explained 32% of the variance in friend ratings. Of note, we observed a significant Flexibility × Stress × Prime interaction. To probe the 3-way interaction, we graphed the interaction between cumulative life

stress and EF separately for participants in the neutral prime condition and in the threat prime condition (see Figure 2). *T* tests of simple slopes showed that participants in the neutral condition who demonstrated low EF evidenced worse adjustment when exposed to high cumulative life stress, $t(42) = -2.10$, $p < .05$. Those with high EF in the neutral condition did not show a decrease in adjustment in the context of high cumulative life stress ($p > .40$). Likewise, participants in the threat condition who demonstrated low EF had worse adjustment when exposed to high cumulative life stress, $t(42) = -2.19$, $p < .05$. However, those with high EF in the threat condition were rated by their friends as *better* adjusted if they were exposed to high cumulative life stress, $t(42) = 2.16$, $p < .05$.

Overall, these findings support the conclusion that EF protects participants from the potentially deleterious effects of cumulative life stress. Although EF was identifiable in both threat and neutral prime conditions, the relation between EF and adjustment was stronger when measured in the threat prime condition. With regard to the relative importance of suppression and enhancement ability, our findings suggest that expressive suppression ability may be more adaptive in the face of high cumulative life stress than expressive enhancement ability; while expressive enhancement ability was only related to adjustment when measured in the neutral prime condition, suppression ability was related to adjust-

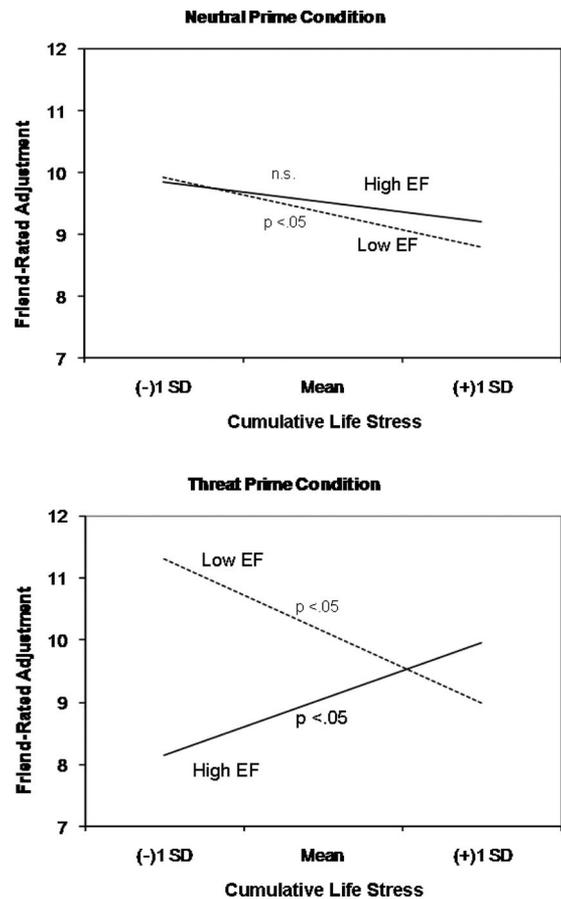


Figure 2. Expressive flexibility (EF) moderates the impact of cumulative life stress on friend-rated adjustment.

ment when measured in both neutral and threat conditions. Moreover, the relation between adjustment and suppression was most pronounced when measured under threatening conditions.

Alternative explanation. An alternative explanation for these results was that EF may have been confounded by baseline level of expressiveness (i.e., expression of emotion in the control condition) because of the experimental measure's potential floor and ceiling limitations. According to this argument, participants with a high level of baseline expressiveness may not have had enough room on the upper end of the emotion rating scale to demonstrate a significant increase in emotion expression, while participants with a low baseline expressiveness may not have had enough room on the lower end of the rating scale to demonstrate a significant decrease in emotion expression. In order to rule out this alternative explanation, we repeated the regression for EF while controlling for level of expressiveness in the control condition. No support for this explanation was evident. Baseline expressiveness did not enter significantly into the equation ($p > .35$), the model was significant, $F(8, 41) = 2.53$, $p < .05$, and the $EF \times Stress \times Prime$ interaction remained significant ($p \leq .05$).

Discussion

We designed this study with the aim of advancing knowledge about the construct of EF, its measurement, and its role in adjustment. A previous study from our laboratory demonstrated that EF, measured behaviorally as the ability to both enhance and suppress emotional expression, predicted better self-reported adjustment over a 2-year period (Bonanno et al., 2004). In the current investigation, we replicated and extended these findings using a modified version of the EF paradigm. This approach advanced the earlier findings in three ways. First, we established the long-term stability of EF by administering the experimental paradigm to the same sample of college students who had completed the Experiment 3 years prior. Second, we provided further evidence that EF is salubrious in the context of potential threat by manipulating a subliminal threat prime condition for half of the participants and by including weekly online measurements of potentially stressful life events. Third, to extend the validity of the EF paradigm, we assessed participant adjustment using anonymous reports obtained from their close friends. Our findings were generally comparable to those obtained in the initial study that had used only a self-report measure of adjustment.

The Stability of Expressive Flexibility

A primary aim of our study was to provide evidence that EF ability is stable over time. For participants in the neutral prime condition, which mirrored the original study, we observed moderate to large 3-year correlations for all components of the EF score. Established measures of emotional intelligence and personality have shown larger stability correlations but only at shorter intervals (4 months) (e.g., (EQ-I; Bar-On, 2002) (LOT-R; Scheier, Carver, & Bridges, 1994). When measured over longer intervals, the correlations for these measures are comparable those observed in the present study (e.g., (Parker, Saklofske, Wood, Eastabrook, & Taylor, 2005; Scheier et al., 1994). Overall, our findings indicate that EF has significant trait-like properties and is suited for between-subjects research.

Expressive Flexibility as a Protective Factor

The second and third aims of our study were to replicate and extend previous research on the predictive validity of EF (Bonanno et al., 2004) by examining whether cumulative life stress and immediate threat context influence the relation between EF and adjustment (Aim 2) and by using improved measures of adjustment and EF (Aim 3). Specifically, we aimed to test the hypotheses that EF protects against potentially deleterious effects of cumulative stress and more fully emerges and aids adaptation in threatening contexts.

Cumulative life stress. As predicted, EF moderated the relationship between cumulative life stress and adjustment, as indexed by friend ratings. For participants with low EF, the presence of a high number of potentially stressful life events was associated with poorer adjustment. In contrast, participants with high EF evidenced resilient outcomes, suggesting that high EF may protect against the negative impact of cumulative life stress. Further analyses supported the conclusion that both expressive enhancement ability and expressive suppression ability are important. When analyzed separately, both high enhancement ability and high suppression ability predicted better adjustment in the context of high cumulative life stress, although the findings were more robust for suppression ability.

The manner in which we measured cumulative life stress makes these findings particularly compelling. We asked participants to complete an online measure of potentially stressful life events every week. Researchers studying significant life events have typically relied on retrospective reports that are prone to measurement error and systematic memory bias. When self-report checklists are used to assess memory for stressful life events, stressors tend to be forgotten at the rate of approximately 5% per month (Funch & Marshall, 1984). Furthermore, mood-related memory biases distort the accuracy of autobiographical memories (e.g., Bower, 1981; Eich, Macaulay, & Ryan, 1994). Checking in with participants each week is bound to provide a more reliable index of cumulative life stress than asking them to report on their experience of significant life events on isolated occasions. What is more, we collected these data throughout the academic year. This extended measurement period increased the accuracy and reliability of our measure by generating a wider window of potential stress experienced by participants.

Context-dependent effects of expressive flexibility. We also explored whether the relationship between EF and adjustment would vary in the context of immediate threat. We manipulated threat using a subliminal word prime. For the most part, the results added further support to the hypothesized benefits of EF, though there were some unexpected findings. When EF was measured in a nonthreatening context (i.e., neutral word prime), it was associated with resilience to cumulative life stress. That is, participants who could flexibly regulate their emotional expression in the absence of immediate threat maintained similar levels of functioning regardless of whether they were under low or high cumulative life stress. When EF was measured in a threatening context (i.e., threat word prime), friend ratings suggested that flexible participants actually functioned *better* when exposed to high levels of cumulative life stress than when exposed to low levels of cumulative life stress. While this pattern of findings confirmed our hypothesis that EF would more fully emerge in the context of

immediate threat, we did not anticipate that participants with high EF would show improved functioning when they had experienced a high number of potentially stressful life events.

We suggest three possible explanations for why high EF was associated with higher friend ratings of adjustment in the context of high cumulative life stress. The most straightforward explanation is that participants with high EF simply functioned better when confronted with a high number of potentially stressful life events. Indeed, the concept of resilience as the ability to maintain functioning in the face of adversity presupposes the occurrence of potentially traumatic events or aversive circumstances that may pose a challenge to a person's emotional equilibrium. Alternatively, it is possible that friends overestimated the functioning of participants who demonstrated high EF in the context of immediate threat and high levels of cumulative life stress. Friends may have reported that these participants were functioning better under high levels of cumulative life stress when, in actuality, they were merely maintaining functioning. Despite the fact that resilience is a common response to adversity, it is regarded by many as uncommon (Bonanno, 2004). Thus, people who are able to maintain functioning after potentially traumatic events or during stressful circumstances are often regarded by others as exceptionally well-adjusted. Such an exaggerated perception of resilience may have led friends in our study to inflate their ratings of participants who exhibited high EF in the context of immediate threat and high cumulative life stress.

A combination of the first two possibilities presents a third and more complex explanation: friends' accurate or exaggerated perceptions of a participant's functioning in the midst of high levels of cumulative life stress may contribute to better adjustment by reinforcing the participant's positive coping behaviors. Thus, high levels of life stress may bring to the fore a person's dormant capacity to maintain functioning via flexibly regulating his or her emotional expressions in the presence of immediate threat. Experiencing or witnessing this capacity serves to increase the person's self-efficacy and other peoples' confidence in his or her ability to manage stress, which in turn may lead to improved functioning ("thriving") in a positive cycle of internal and external reinforcement.

We may apply a similar logic in speculating about potential reasons for the finding that high and low EF participants exhibited different and partially unexpected patterns of interaction with prime condition and cumulative life stress. Participants who exhibited high EF in the presence of immediate threat appeared to be able to flexibly regulate their emotional expressions in the face of high cumulative life stress. By contrast, participants low in EF generally did not cope well when exposed to a high number of potentially stressful life events. Thus, participants with low EF were rated by their friends as lower functioning in the context of high cumulative life stress regardless of whether EF was measured in the context of an immediate threat or not (i.e., the association between low EF and poorer adjustment was observed in both threat and neutral prime conditions). Interestingly, however, low EF did not negatively impact friend-rated adjustment as long as potentially stressful life events were infrequent. In other words, participants who demonstrated low EF when measured in the threat prime condition were rated as better adjusted in the context of low cumulative life stress compared with high cumulative life stress.

These findings suggest the intriguing possibility that participants who could not muster the resources for flexible emotional

responding in the context of immediate threat may remain perfectly healthy as long as their lives remain relatively stress free. Indeed, inspection of the graph of the interaction for the threat prime condition in Figure 2 reveals that not only did low EF participants appear to function better in the context of low cumulative life stress, they were actually rated as *better* adjusted than high EF participants. At first sight, this seems a rather paradoxical finding given our emphasis on the adaptive value of EF. However, these surprising findings make more sense when considered in the light of previous research on personality-related differences in emotion regulation and resilience (see Westphal & Bonanno, 2008, for a review). This research suggests that certain forms of habitual or automatic forms of emotion regulation that may be maladaptive or undesirable under normal circumstances can serve adaptive functions in the context of coping with severe adversity. For example, self-enhancement is a personality trait known to carry social costs. Yet trait self-enhancement has been associated with better adjustment to highly stressful circumstances such as war or terrorist attack (Bonanno, Field, Kovacevic, & Kaltman, 2002; Bonanno, Rennike, & Dekel, 2005).

What might be the negative aspects of high EF? It is possible that low flexibility in expressive regulation has other benefits under low-stress circumstances. For instance, participants in the present study may have appeared more transparent and predictable or even "mellow" or "easy-going" to friends if their expressive regulation was consistent across different situational contexts. This same level of low EF, however, may no longer seem appropriate when the person faces a high number of potentially stressful life events. In this context, the relation between EF and adjustment may be reversed because high EF likely serves normalizing functions such as regulation of internal mood states, mobilization of social support, and deepening of social bonds through shared experiences of negative and especially positive emotions. The unanticipated nature of the finding that low EF participants, when measured in the threat condition, were rated as *better* adjusted than high EF participants in the context of low cumulative life stress, however, and the fact that we used only negative and neutral primes in the present study suggests caution in advancing these explanations too strongly and points to the need for further research on context-dependent effects of EF on adjustment, as we describe below.

Another pattern of findings that merits further investigation were the separate but context-specific contributions of enhancement and suppression ability to adjustment. In the current study, expressive enhancement ability predicted resilience to high cumulative life stress when measured in the neutral prime condition but was unrelated to adjustment when measured in the threat prime condition. By contrast, suppression ability predicted resilience when measured in both contexts but was more strongly related to adjustment when measured in the threat condition. On the surface, these findings seem to suggest that suppression ability manifested in the presence of immediate threat may be more adaptive. Alternatively, one might speculate that threat cues presented in an experimental context may trigger impression-management motives that facilitate suppression of emotional expressions but have no impact on expressive enhancement because enhancement ability may be more relevant in the presence of positive cues. Testing this hypothesis directly would require adding a positive word prime condition (e.g., "love" or "appreciation") in future studies.

Additional Limitations and Future Directions

Notwithstanding the limitations associated with the lack of a positive prime comparison, the present investigation boasts several methodological advantages. Our comprehensive, multimethod research design included a relatively objective laboratory measure of expressive regulation ability, and our manipulation of contextual threat was controlled by random assignment and subliminal presentation. Since the experiment was embedded within a longitudinal study, we were able to sample potentially stressful life events over an extended period of time and to assess the long-term stability of EF. Using outcome ratings from participants' friends provided a more objective measure of adjustment and measurement of EF was improved by utilizing a more sophisticated EF index score.

Despite these advances, there are several additional limitations of our research design worth noting. One limitation concerns the use of pictorial stimuli drawn from the International Affective Picture System (IAPS; Lang et al., 1995). Although the IAP set contains a wide range of normed images, which allowed us to balance emotional stimuli for valence and intensity and thus increase internal validity, the drawback is that pictorial stimuli potentially elicit less emotion than films or social interactions. To increase external validity, future studies should include alternative types of stimuli.

Another limitation concerns our relatively undifferentiated approach to emotion, which may have contributed to the lack of valence-specific effects observed in this study. We categorized emotion globally as either positive or negative. This binary categorization is consistent with a dimensional approach to emotion (Feldman Barrett & Russell, 1999; Russell, 1980) and is supported by neuropsychological evidence that separate brain structures exist to process positive and negative emotion (Ochsner & Feldman Barrett, 2001). From a discrete emotions perspective (Ekman, 1992), emotional response programs evolved because they fostered adaptation to specific environmental challenges. This perspective suggests value in investigating how flexible regulation of discrete emotions across different contexts might impact adjustment.

A third limitation is our reliance upon college samples, which represent a relatively homogenous group compared with noncollegiate adult participants (Peterson, 2001). Consequently, findings from the present study may not generalize to other populations that differ with regard to race, ethnicity, socioeconomic status, education, or psychiatric impairments. To address some of these concerns, our laboratory is currently investigating whether EF helps middle-aged people cope with conjugal bereavement. Using the EF paradigm with ethnically diverse samples may further illuminate context-dependent advantages of suppression and enhancement ability. For example, while our data suggest that suppression ability may be beneficial to adjustment, it is conceivable that replicating the EF paradigm in non-Western societies with different emotion display rules would produce different findings.

In conclusion, when considered together, our findings highlight the importance of context in emotion regulation (Bonanno et al., 2007; Papa & Bonanno, 2008) and strengthen the argument that the relation between EF and adjustment in the face of adversity is significant and pervasive. Future studies using the EF experimental paradigm should utilize both negative and positive primes and include ethnically diverse samples facing different levels of acute and chronic stress. We anticipate that such research will produce further support for the idea that EF promotes resilience.

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