
The Dissociation of Emotion Expression From Emotion Experience: A Personality Perspective

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When we want to know what others are feeling, we look to the face for clues. However, individual differences matter: Some faces are more expressive than others. Do both emotion experience and dispositional expressivity predict emotion expression? Based on an analysis of display rules, the authors hypothesized that expressivity would moderate the relation between experience and expression for negative, but not for positive, emotion. Study 1 examined the relation between habitual emotion experience and peer-rated expressive behavior, and showed the predicted moderator effect for negative emotion: Experience was related to expression only for dispositionally high-expressivity participants, not for low-expressivity participants. For positive emotion, however, experience was related to expression for both groups. Study 2 replicated these findings using momentary emotion experience and objectively coded expressive behavior during films that elicited amusement and sadness. Results are interpreted in terms of low-expressivity individuals' propensity to dynamically regulate negative emotion-expressive behavior.

Why do we attend so closely to the emotional expressions of friends as they give differing accounts of a fight, depressed patients as they insist they are no longer suicidal, or dating partners as they defer a date? In part, we seem to believe that individuals' facial and bodily movements provide a window onto their feelings and motivations (Kappas, 1997). Indeed, the phrase "emotional expression" implies that observable emotional behavior is an outward expression of inner feelings.¹ But is emotion-expressive behavior indeed a fairly accurate indication of felt emotion (Ekman, 1972; Izard, 1971; Tomkins, 1962) or is there little relation between emo-

tion experience and emotion-expressive behavior (Chovil, 1991; Fernandez-Dols & Ruiz-Belda, 1995; Fridlund, 1994)? We review research suggesting that experience and expression are modestly positively related. We then propose a personality perspective to better understand the relation between emotion experience and expression and report two studies that illustrate the heuristic value of a joint personality-emotion approach.

What Gives Rise to Emotion Expression?

Emotion expression may be defined as the behavioral changes that usually accompany emotion, including the face, voice, gestures, posture, and body movement (Gross & John, 1995, 1997). Examples include smiling, frowning, crying, or storming out of the room. But how does emotion-expressive behavior arise? To answer this question, it is useful to consider a process model of emotion that is a distillation of major points of convergence among emotion researchers (e.g., Arnold, 1960; Ekman, 1972; Izard, 1977; Lang, 1995; Lazarus, 1991; Levenson, 1994; Leventhal, 1984; Plutchik, 1980; Scherer, 1984; Tomkins, 1962). According to this model (see Figure 1), emotion begins with the evaluation of external or inter-

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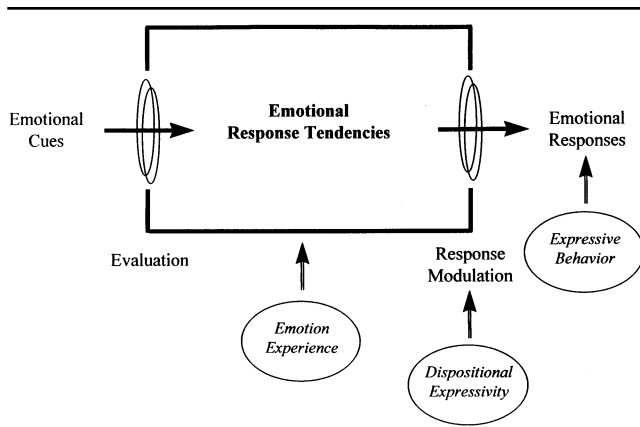


Figure 1 A consensual process model of emotion generation.

nal emotional cues. Certain evaluations (or appraisals) trigger a coordinated set of emotional response tendencies geared to facilitate adaptive action in the face of perceived challenges and opportunities. Response tendencies do not guarantee action, however, because these tendencies may be modulated through inhibition or exaggeration. It is the modulatory output filter, therefore, that provides final shape to the emotion-expressive behavior (for a more detailed discussion, see Gross, 1998b).

The model in Figure 1 does not, and is not meant to, address all aspects of emotional responding. However, it does suggest that differences in emotion-expressive behavior may arise at a number of different steps in the emotion-generative process (Gross & John, 1995, 1997). First, individuals differ widely in the everyday circumstances they encounter and select; thus, they receive very different environmental and internal inputs. Second, the impact of these differential inputs may be diminished or enhanced by the way the individual construes what is happening (Stemmler, 1997). For example, instead of taking offense at a store clerk's nasty remark, one may focus on what a tough day the clerk must be having. Third, temperament research suggests that there are important individual differences in the activation thresholds for emotion response tendencies (Rothbart & Ahadi, 1994). Fourth, as we have argued (Gross & John, 1995, 1997), there may be important individual differences in the modulatory output filter, that is, differences in how emotional response tendencies are translated into behavior. Such modulation may take the form of biting one's tongue when criticized by a manager (Averill, 1982) or hiding sadness because one does not want to appear weak in front of one's friends (see Williams, 1982).

The present research focuses on individual differences in the last two of these steps. One step concerns

the emotional response tendencies, whose strength is reflected—albeit imperfectly—in the individual's emotion experience. The other step concerns individual differences in the modulatory output filter, which may be assessed—again indirectly—using measures of dispositional expressivity (Gross & John, 1997). To set the stage, we first consider previous research related to these two steps, in particular, how (a) emotion experience and (b) dispositional expressivity are related to the behavioral expression of emotion. We then turn to the question that motivated the present research: Do emotion experience and dispositional expressivity predict emotion-expressive behavior independently or do they interact?

Emotion Experience and Emotion Expression

A number of studies show that when research participants are in situations thought to elicit emotion experience, their facial muscles move; facial electromyogram (EMG) responses have been demonstrated during affective imagery (e.g., Schwartz, Fair, Salt, Mandel, & Klerman, 1976), slide viewing (e.g., Jancke, 1993), and film viewing (e.g., Hess, Banse, & Kappas, 1995). Although few of these studies included reports of their emotion experience, those that did generally report positive correlations between emotion experience and EMG responses (Cacioppo, Martzke, Petty, & Tassinari, 1988; Dimberg, 1988; but see Fridlund, Kenworthy, & Jaffey, 1992). Further evidence comes from studies that relate emotion-expressive behavior coded from videotape to self-reports of emotion experience. These studies show positive correlations in a variety of elicitation situations, including receipt of shock (see McHugo & Smith, 1996), performance feedback (Casey, 1993), and social interaction (Blumberg & Izard, 1991). Another common induction procedure in this literature is the film viewing paradigm, which generally provides evidence of positive but modest associations between emotion experience and coded expressive behavior (e.g., Rosenberg & Ekman, 1994; but see Fernandez-Dols, Sanchez, Carrera, & Ruiz-Belda, 1997).

Overall, then, a wide range of studies suggest that the relation between emotion experience and spontaneous emotion expression is positive but only modest in size (see also Adelman & Zajonc, 1989; McIntosh, 1996). Given that the relation between experience and expression is far from perfect, the crucial question becomes: What else besides emotion experience contributes to emotion expression?

Dispositional Expressivity and Emotion Expression

Dispositional expressivity refers to stable individual differences in emotion-expressive behavior and is typi-

cally assessed using self-report instruments (Gross & John, 1995; King & Emmons, 1990; Kring, Smith, & Neale, 1994). Do such personality measures of dispositional expressivity predict emotion-expressive behavior? Dispositional expressivity predicts ratings of expressivity made by peers (King & Emmons, 1990) and family members (Kring et al., 1994). Dispositional expressivity also predicts happiness-expressive behavior observed during positive films (Kring et al., 1994).

Although expressivity often has been operationalized as a unidimensional construct (for a review, see Gross & John, 1998), we favor a hierarchical conception, defining the general expressivity dimension in terms of several interrelated facets (Gross & John, 1995). These include positive expressivity, which refers to individual differences in the expression of positive emotions, and negative expressivity, which refers to individual differences in the expression of negative emotions. Although these two expressivity facets correlate about .50, they show good convergent and discriminant validity (Gross & John, 1997, 1998). For example, the negative scale on the Berkeley Expressivity Questionnaire (BEQ) (Gross & John, 1995) predicted laboratory observations of negative emotion expression but not laboratory observations of positive emotion expression (Gross & John, 1997).

Together, these studies indicate that dispositional expressivity is an important predictor of emotion-expressive behavior. For example, individuals high (rather than low) in positive expressivity laugh more when they are amused, and individuals high (rather than low) in negative expressivity cry more when they are sad.

Joint Effects of Experience and Expressivity on Positive and Negative Expression: Two Models

Our literature review suggests that understanding emotion-expressive behavior requires knowledge about both emotion experience and dispositional expressivity. But what if measures of emotion experience and dispositional expressivity turned out to be redundant? The available evidence suggests that correlations between emotion experience and dispositional expressivity are modest. Using the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988) as a measure of habitual emotion experience, and the BEQ as a measure of dispositional expressivity, experience and expressivity correlated .34 for positive emotion and .14 for negative emotion in a sample of more than 1,200 participants (Gross & John, 1997). Kring et al. (1994) found correlations of .11 and .13 and showed that dispositional expressivity predicted expressive behavior even when the effects of self-reported experience were controlled. Thus, individual differences in habitual experience and

dispositional expressivity are distinct, and both are likely to predict emotion-expressive behavior.

If emotion experience and dispositional expressivity are nonredundant, then the next question is whether they interact in the prediction of expressive behavior. In Figure 2, we present the pattern of findings predicted by two possible models. The panel on the left shows the pattern of findings predicted by what we call the *fixed modulation model*. According to this model, filter settings (see Figure 1) for low- and high-expressivity individuals are assumed to be different; however, both are fixed so that an increment in emotion experience is translated into a constant increment in expressive behavior. Thus, dispositionally low- and high-expressivity individuals would differ in the amount of expressive behavior at any given level of emotional experience, but this difference is constant. On this model, then, emotion-expressive behavior should be a function of emotion experience for both low- and high-expressivity individuals, as indicated by the positive (ascending) slope of both lines in Figure 2. However, low-expressivity individuals should reveal less of what they feel at each level of felt emotion than do high-expressivity individuals, as indicated by the constant difference between the two lines in absolute level.

To make this prediction more concrete, let us take two football spectators, low-expressivity Larry and high-expressivity Harry. Avid sports fans seated at the 50-yard line, they experience identical levels of positive emotion over the course of a crucial home game. What the fixed modulation model shown in the left panel of Figure 2 suggests is that both Larry and Harry's expressive behavior would tell us what they were feeling at any point in the game, as long as we keep in mind that a small smile from low-expressivity Larry represents as much positive emotion experience as loud shouts of glee from high-expressivity Harry.

Absent pressures to dissociate emotion expression from emotion experience, the literature reviewed above would lead us to expect results to conform to the fixed modulation model. For positive emotion in general, therefore, we see no reason that experience and expression should interact, and we would expect findings to best fit those predicted by the fixed modulation model.

Contrast this pattern to that presented on the right side of Figure 2, which is predicted by the *dynamic modulation model*. According to this model, filter settings for low-expressivity individuals are assumed to be dynamic (i.e., variable). To keep emotion-expressive behavior constant across the whole range of experience, low-expressivity individuals would have to engage in some modulation at low levels of emotion experience but increasingly greater modulation at higher levels of emotion experience. As a result of this dynamic modulation process, low-expressivity individuals would exhibit more

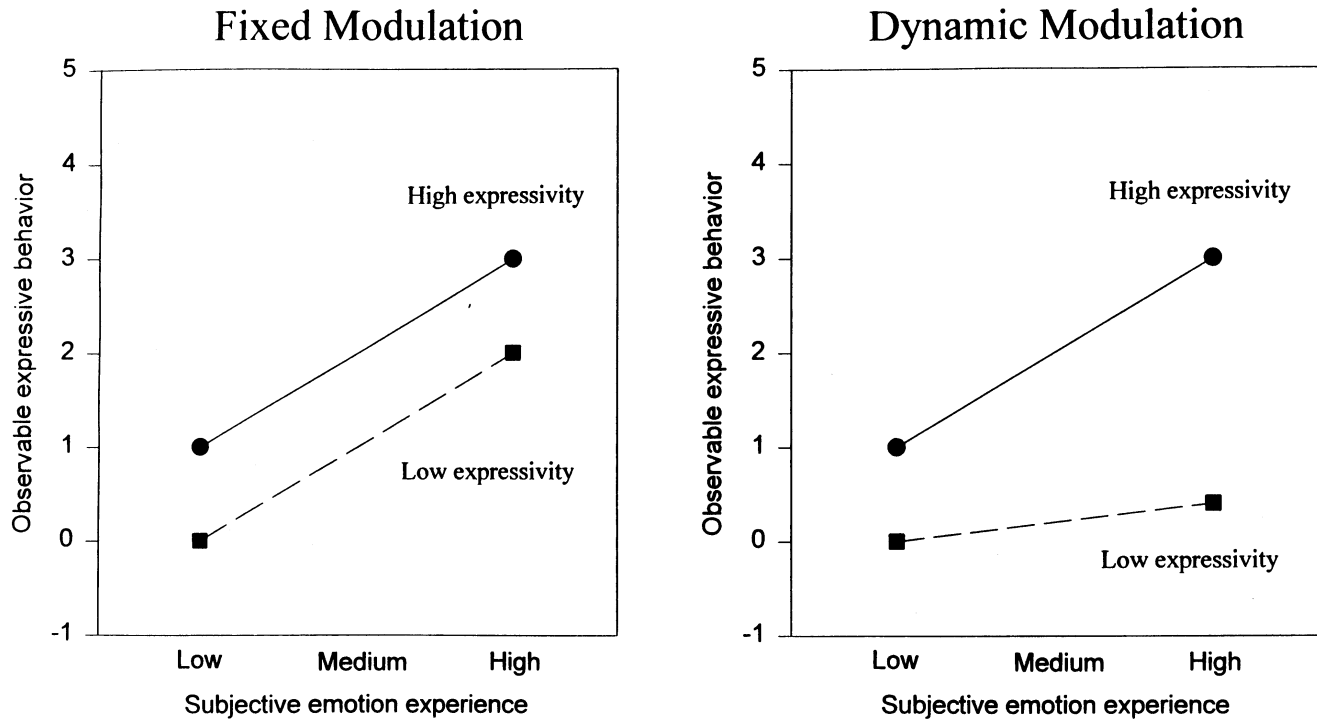


Figure 2 Effects of emotion experience and dispositional expressivity on emotion-expressive behavior: Differential predictions made by two models.

or less the same limited amount of expressive behavior regardless of the intensity of their emotional experience.

In correlational terms, the dynamic model predicts that dispositionally high-expressivity individuals would show a much stronger correlation between their feelings and their expressive behavior than should low-expressivity individuals, who should show little, if any, correlation. In other words, dispositional expressivity should moderate the relation between experience and expression.

What might give rise to such dynamic modulation? One important factor involves display rules (Ekman & Friesen, 1969)—cultural, gender, and personal norms that specify how and when an individual should express particular emotions. These display rules are learned early and internalized and may therefore function automatically in adulthood. Although there are display rules for both positive and negative emotions, the expression of negative emotions is much more restricted. This negative-positive asymmetry is consistent with a number of observations: People seem to laugh more than they cry, they report expressing more positive emotion than negative emotion in their daily lives (Gross & John, 1995), they are better liked by others if they express more positive than negative emotion (Gross & John,

1998), and they point to negative emotions (such as anger and sadness) when asked what emotions they try not to express (Gross & Richards, 2000). Although strict display rules would have the effect of attenuating the relation between the experience and expression of negative emotion for all individuals, those low in negative expressivity are likely to be more sensitive to these display rules (see Jones, 1950; Lanzetta & Kleck, 1970). They endorse such items as, "No matter how nervous or upset I am, I tend to keep a calm exterior" (Gross & John, 1995), revealing concerns about appropriate emotion displays not shared by individuals high in negative dispositional expressivity, who endorse items such as, "If someone makes me angry in a public place, I will 'cause a scene'" (King & Emmons, 1990).

For negative emotion, therefore, we expected that emotion experience and dispositional expressivity would interact in predicting emotion expression, as shown by the dynamic modulation model on the right in Figure 2. High-expressivity individuals should show emotion-expressive behavior relatively uninhibited by display rules and commensurate with their feelings, whereas low-expressivity individuals—being more sensitive to display rules that limit negative emotion expression—should show little increase in negative emotion-

expressive behavior even as their experience of negative emotion increases. If we return to our dispositionally low-expressivity (Larry) and high-expressivity (Harry) football fans, what does our hypothesis predict as both men grow equally disheartened by their team's fumbling performance in the second half of the football game? Whereas high-expressivity Harry shows negative emotion-expressive behavior that remains an accurate index of his negative feelings, Larry's behavior no longer gives any hint as to what he is feeling. We tested the general prediction that positive and negative emotion-expressive behavior would follow different modulatory models in two studies.

STUDY 1: PEER RATINGS OF EMOTION EXPRESSIVITY

Does dispositional expressivity moderate the relation between emotion experience and emotion expression for negative emotion but not for positive emotion? To test this hypothesis, we used the positive and negative affect scales from the PANAS (Watson et al., 1988) to measure habitual emotion experience and the positive and negative expressivity scales from the BEQ (Gross & John, 1995) to measure dispositional expressivity. To avoid shared method variance, we did not want to use self-reports to measure emotion-expressive behavior. Instead, we used peer ratings of emotion-expressive behavior. Emotion expression often takes place in social settings, and interactions with others naturally give rise to opportunities to observe individual differences in emotional behavior. Peer ratings have been used previously to measure expressive behavior broadly conceived (e.g., Burrowes & Halberstadt, 1987; King & Emmons, 1990; Kring et al., 1994; Snyder, 1974). Similar to Watson and Clark (1991, 1994), we used specific emotion descriptors; however, whereas Watson and Clark were more broadly interested in emotional traits and thus asked peers to consider both feelings and actions of the target individuals, we focused on behavioral expression of a set of specific positive and negative emotions.

Because peers can observe an individual in a wide range of emotion-eliciting circumstances, they provide an important perspective on his or her expressive behavior—one that reflects behavior across time and naturally occurring, personally relevant situations. Of course, even the most intimate associate does not have access to all of an individual's expressive behavior. Nonetheless, enough of an individual's emotional responding takes place in social settings that close acquaintances should be able to provide an adequate behavioral sample of the individual's typical emotional expressions, particularly if multiple informants are used. Given that we were testing relations across different data sources and multiple

effects, we expected that individual effect sizes would be modest, particularly for the hypothesized moderator effect for negative emotion (cf. Chaplin, 1997).

Control Measures: Sex, Extraversion, and Neuroticism

Are there other variables that influence emotion-expressive behavior? One is sex; women tend to be somewhat more emotionally expressive than are men (e.g., Hall, 1979; Kring & Gordon, 1998). Two other variables of interest are the broader personality dimensions of extraversion and neuroticism (Costa & McCrae, 1992; Eysenck, 1990), which also have been interpreted as positive emotionality and negative emotionality, respectively (Tellegen, 1985). Conceptually, extraversion and neuroticism would be expected to influence the emotion-generative process at each of the first three steps in the emotion model shown in Figure 1. First, extraversion and neuroticism influence the kinds of situations the individual is likely to encounter and select (Caspi & Bem, 1990). Second, these traits influence the way emotional cues are evaluated and appraised (Scheier & Carver, 1993). Third, these traits influence the threshold and intensity of the initial emotion response tendencies and thus the subjective experience of emotion (Gross, Sutton, & Ketelaar, 1998). However, we did not expect extraversion and neuroticism to influence response modulation (and hence the relation between emotion experience and expression), thus contrasting with the predictions we made for our more narrowly defined positive and negative expressivity constructs. To test this differential prediction, we included measures of extraversion and neuroticism in Study 1. In particular, we tested (a) whether these two broad traits show the same effects we predicted for positive and negative expressivity and (b) whether they account for the effects of positive and negative expressivity when included as predictors.

Method

Participants. As part of a larger project on personality and emotion, 304 participants took part in this study. Of these, 76 were target participants who volunteered to fulfill a requirement of an introductory psychology course. On average, they were 21 years old ($SD = 3$ years); 79% were women. Participants were of various ethnic backgrounds (3% African American, 21% Asian American, 55% White, 13% Latino, and 8% other). An additional 228 participants were peers of the target participants. Peers were most often friends (82%) and roommates (31%) of the target participants; 7% were relatives. On average, they had known the targets for about 3 years; 62% of the peers were female.

Measures: target participants. To measure habitual emotion experience, target participants completed the PANAS (Watson et al., 1988) because its positive and negative affect scales matched the positive and negative emotion-expressivity facets found in previous research (Gross & John, 1995, 1998). The PANAS includes 10 positive items (e.g., excited, active) and 10 negative items (e.g., distressed, irritable). Items were administered in the general format, with the instructions to rate “to what extent you generally feel this way” on a scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). In the present sample, alphas were .89 for positive affect and .88 for negative affect, and the two scales were fairly independent ($r = -.21, p < .10$).

To measure dispositional expressivity, target participants completed the 16-item BEQ (Gross & John, 1995). The Positive Expressivity subscale ($\alpha = .73$) includes items such as, “When I’m happy, my feelings show.” The Negative Expressivity subscale ($\alpha = .67$) includes items such as, “Whenever I feel negative emotions, people can easily see exactly what I am feeling.” Gross and John (1995, 1997) found that positive and negative expressivity are correlated facets of a superordinate dimension of expressivity; in the present study, the correlation was .52 ($p < .01$). Nonetheless, the two scales have substantial convergent and discriminant validity (Gross & John, 1997).

To measure the broad affective traits of extraversion and neuroticism, participants completed Costa and McCrae’s (1992) 60-item NEO-Five Factor Inventory (NEO-FFI). Although participants completed the entire questionnaire, only the dimensions of extraversion ($\alpha = .86$) and neuroticism ($\alpha = .89$) are of interest here.

Peer ratings of positive and negative emotion expression. Peers were selected by the target participants, who nominated three people who knew them well enough to describe their personality. We used three peers, following Watson and Clark’s (1991) suggestion that “three well-acquainted raters are necessary to achieve a generally significant level of self-peer convergence for emotional traits” (p. 933). To measure the expression of positive and negative emotions in everyday life, the peers were asked to indicate, “To what extent does X typically express each of the following emotions?” Peer raters used a 7-point scale ranging from 1 (*much less than most people*) to 7 (*much more than most people*). Following previous research (e.g., Diener, Smith, & Fujita, 1995; Gross & John, 1998; Watson et al., 1988), the positive emotions were amusement, joy, love, and pride, and the negative emotions were anger, fear, sadness, and shame. Ratings were aggregated across the three peers for each participant. Two composites were formed: Positive emotion expression was the average rating of the four positive

emotions ($\alpha = .62$) and negative emotion expression was the average of the four negative emotions ($\alpha = .57$).

Results and Discussion

Positive emotion expression. Table 1 (above the diagonal) presents the intercorrelations among the three variables of interest for positive emotion. As expected, both habitual experience (as measured by PANAS positive affect) and dispositional expressivity (as measured by BEQ positive expressivity) correlated positively with the criterion, peer-rated positive emotion expression. Note that these cross-method correlations both exceeded the often-invoked .30 barrier for personality validity coefficients (e.g., Mischel & Peake, 1982).

To examine the independent and interactive effects of the two predictors, we conducted a moderated multiple regression, predicting positive emotion expression from PANAS positive affect, BEQ positive expressivity, and their interaction. Following the Friedrich solution (Aiken & West, 1991), the two predictors were standard scored before the interaction term was computed, and then all three predictors were entered simultaneously.² The multiple R was .45 (.41 when corrected for shrinkage). As shown by the significant betas in Table 2, both habitual emotion experience and dispositional expressivity were positively and independently related to emotion expression. However, as predicted, their interaction was not significant ($\beta = -.02$), indicating that the nature of the relation between experience and expression did not depend on dispositional expressivity.

The left panel of Figure 3 shows these effects in standard (Z) score metric following Aiken and West’s (1991) recommendations for displaying interaction effects in multiple-regression designs. The regression line for high-expressivity individuals was defined by participants scoring 1 SD above the sample mean on positive expressivity, whereas the regression line for low-expressivity individuals was defined by participants scoring 1 SD below the sample mean. As expected on the basis of the fixed modulation model, there was a main effect of positive expressivity, as indicated by the separation of the two regression lines. The main effect of emotional experience is indicated by the positive slope of both regression lines. Note that the two regression lines were almost parallel (β s of .22 for the high- and .26 for the low-expressivity participants). Thus, the relation between positive emotion experience and expression was essentially the same for participants high and low in expressivity; that is, the left panel of Figure 3 shows no evidence of an interaction effect, providing evidence only for the fixed modulation model.

Negative emotion expression. Table 1 (below the diagonal) presents the intercorrelations among the three variables relevant to our analysis of negative emotion. Both

TABLE 1: Correlations Among Habitual Emotion Experience (PANAS), Dispositional Expressivity (BEQ), and Peer-Rated Expression for Positive Emotion (above diagonal) and Negative Emotion (below diagonal)

	<i>Experience (PANAS)</i>	<i>Expressivity (BEQ)</i>	<i>Peer-Rated Expression</i>
Habitual experience (PANAS)	—	.25*	.32*
Dispositional expressivity (BEQ)	.04	—	.39*
Peer-rated emotion expression	.42*	.37*	—

NOTE: $N = 76$. PANAS = Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), BEQ = Berkeley Expressivity Questionnaire (Gross & John, 1995).

* $p < .05$ (two-tailed).

TABLE 2: Moderated Multiple Regression Results in Study 1: Predicting Peer-Rated Positive and Negative Emotion Expression From Habitual Emotion Experience (PANAS), Dispositional Expressivity (BEQ), and Their Interaction (PANAS $\times$ BEQ)

<i>Peer-Rated Expression</i>	<i>Standardized Regression Weights (β)</i>		
	<i>Experience (PANAS)</i>	<i>Expressivity (BEQ)</i>	<i>Experience $\times$ Expressivity (PANAS $\times$ BEQ)</i>
Positive emotion	.24*	.32*	-.02
Negative emotion	.42*	.37*	.23*

NOTE: $N = 76$. PANAS = Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), BEQ = Berkeley Expressivity Questionnaire (Gross & John, 1995).

* $p < .05$ (two-tailed).

habitual experience and dispositional expressivity correlated positively with negative emotion expression. It is noteworthy that these cross-method correlations were of impressive size.

To test the hypothesized interaction effect, we conducted a moderated multiple regression, predicting negative emotion expression from PANAS negative affect, BEQ negative expressivity, and their interaction. As in the previous analysis, the two main effects were standard scored before computing the interaction term, and then all three predictors were entered simultaneously. The multiple R was .59 (.57 when corrected for shrinkage). As shown by the betas in Table 2, both habitual emotion experience and dispositional expressivity made independent contributions to the prediction of negative emotion expression. However, unlike our previous findings for positive emotion, there was a significant interaction effect ($\beta = .23$). Thus, for negative emotion, the nature of the relation between experience and

expression depended on the individual's level of dispositional expressivity.

The right panel of Figure 3 shows these effects in standard (Z) score metric. Again, the two regression lines were defined for participants 1 SD above or below the sample mean on negative expressivity. As expected, there was a main effect of negative expressivity. Most important, however, the two regression lines were not parallel. For low-expressivity participants, the relation between habitual experience and emotion-expressive behavior was weak ($\beta = .19$); in contrast, for high-expressivity participants, there was a robust positive relation ($\beta = .65$). Statistically, the interaction effect (here shown as the difference in slope between the two regression lines) provided evidence for the moderator effect suggested by the dynamic modulation model.

Effects of sex. To see whether participant sex played any role in these findings, we conducted another set of regression analyses in which we entered sex as an additional predictor. There were no main effects for sex (male coded 0 and female coded 1) for either positive ($\beta = .10$, ns) or negative ($\beta = .14$, ns) emotion expression. In a second set of analyses, we computed separate regressions for men and women and found that the pattern of results closely replicated. Consider the betas for the crucial interaction effects: For positive emotion expression, the betas were negligible both for women ($-.06$) and men ($.07$), just as in the total sample. For negative emotion expression, however, the betas were positive both for women ($.28$) and men ($.34$) and similar in size to the beta in the total sample. In short, there was no evidence that our findings differed for the two sexes.

Effects of extraversion and neuroticism. We expected extraversion and neuroticism to have their primary impact on emotional responding at the initial steps in emotion generation, prior to response modulation (see Figure 1). To test this expectation, we examined whether extraversion and neuroticism moderated the relation between emotion experience and emotion expression in the same way as positive and negative expressivity. In the first analysis, we predicted positive emotion expression using habitual positive emotion experience, extraversion, and their interaction. The NEO measure of extraversion predicted positive emotion expression ($\beta = .34$, $p < .05$), but neither positive emotion experience ($\beta = .16$, ns) nor the interaction of the two predictors ($\beta = .13$, ns) were significant. In the second analysis, we predicted negative expression using habitual negative emotion experience, neuroticism, and their interaction. Would the effect of emotion experience be moderated by neuroticism as it had been by dispositional negative expressivity? Our results suggested not. The NEO measure of neuroticism predicted negative expression ($\beta = .32$, $p <$

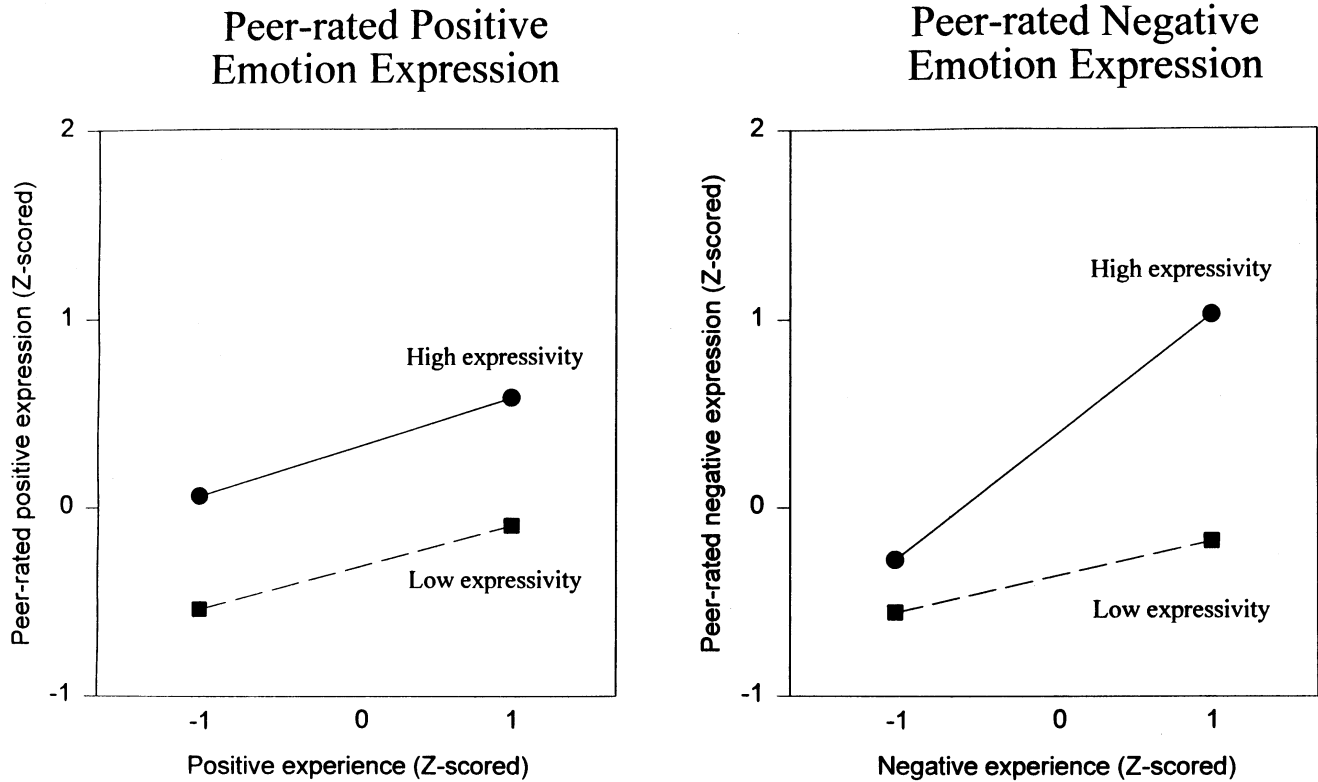


Figure 3 Study 1: Relations of habitual emotion experience and dispositional expressivity to peer-rated positive and negative emotion-expressive behavior.

.05), as did emotion experience ($\beta = .28, p < .05$), but the interaction term was not significant ($\beta = -.09, ns$). Together, these analyses indicate that extraversion and neuroticism did not moderate the relation between emotion experience and expression.

The second question is whether the moderating effects of dispositional expressivity found in our primary analyses are independent of the main effects of extraversion and neuroticism. Would the same pattern of findings evident in our primary regression analyses still obtain even if extraversion and neuroticism were entered as predictors? In the first analysis, we predicted positive expressive behavior from extraversion as well as habitual emotion experience, dispositional positive expressivity, and the interaction of experience and expressivity. Only positive expressivity was a significant predictor of positive expression ($\beta = .27, p < .05$); the other betas were .21 (*ns*) for extraversion, .12 (*ns*) for experience, and $-.01$ (*ns*) for the Experience $\times$ Expressivity interaction. Presumably, neither extraversion nor experience made significant independent contributions because they predicted overlapping variance in positive expressive behavior.

In the second regression, we predicted negative expressive behavior from neuroticism as well as habitual

emotion experience, dispositional negative expressivity, and their interaction. All three main effects were significant: The betas were .32 ($p < .01$) for neuroticism, .24 ($p < .05$) for experience, and .36 ($p < .01$) for dispositional expressivity. Most important, the beta for the Experience $\times$ Expressivity interaction effect was .21 ($p < .05$), which is both significant and essentially the same size as in the earlier analysis that did not include neuroticism.

Summary and evaluation. These findings suggest several conclusions. First, emotion experience and dispositional expressivity were both important predictors of peer ratings of emotion-expressive behavior; this was true for both positive and negative emotion. Second, as hypothesized, we found an interactive effect of experience and expressivity for negative emotion but not for positive emotion. Third, these effects held for both sexes. Fourth, the broader personality dimensions of extraversion and neuroticism could not account for our findings and are consistent with our view that these personality dimensions influence the early steps of the emotion-generation process rather than the response modulation step. Finally, these findings also provide further validity evidence for both PANAS and BEQ: Both measures showed correlations of greater than .30 with

peer ratings of expressive behavior for both positive and negative emotions.

The evidence for the postulated interaction effect for negative emotion is encouraging. However, interaction effects are often unreliable because they can be influenced by the reliabilities of the predictors and their intercorrelations and thus susceptible to substantial sample fluctuations (Chaplin, 1997). Furthermore, effect sizes for interaction terms are typically small (Chaplin, 1997; Wiggins, 1973), and the present study is by no means an exception. Thus, a replication was mandatory before we could place much confidence in these results.

Rather than a conducting a strict replication, we extended Study 1 to address some of its limitations. Because we were interested in the general sweep of emotion experience and emotion expression, Study 1 used relatively distal measures that required participants to report over long periods of time. Thus, one important question was whether our findings, obtained with these aggregate measures, would generalize to briefer periods of time. In other words, would dispositional expressivity also moderate the relation between momentary negative emotion experience and behavioral expression in a specific situation? This is an important question because the hypothesized modulatory process is assumed to operate over seconds and minutes rather than weeks or months.

STUDY 2: EMOTION-EXPRESSIVE BEHAVIOR IN THE LABORATORY

Would the same pattern of relations also be evident if we considered momentary experience and expression of emotion? To address this question, several methodological criteria had to be met: (a) eliciting specific emotions in a carefully controlled situation, (b) obtaining self-reports of emotion experience close in time to the emotion experience using a standardized rating format, (c) observing emotion-expressive behavior, (d) coding this expressive behavior objectively and independent of knowledge of emotion experience reports, and (e) assessing trait expressivity, preferably at an earlier time so as to avoid any contamination of measures. Although we found no sex differences in the relation between habitual emotion experience and peer-rated expression in Study 1, there have been reports of sex differences in mean levels of momentary emotion experience and expression (e.g., Kring & Gordon, 1998). Thus, for simplicity's sake, we used a single-sex sample to examine relations between momentary emotion experience and expression.

One way to meet these methodological criteria is to show short film clips that elicit discrete emotions in individual laboratory sessions. Gross and Levenson (1995) recently validated a set of emotion-eliciting film clips

and established the films' properties as elicitors of emotion experience. Unlike scripted social interaction with confederates, films are invariant across participants, which means that a high degree of control of the experimental setting may be maintained at all times. When used in a laboratory context, it is possible to unobtrusively videotape participants' emotion-expressive behavior as they watch the films. Participants can report the emotion experience right after viewing the brief film clip. Although the levels of emotion experience can be high, participants accept this procedure as a natural one—watching movies is an ecologically relevant activity and is one of undergraduates' favorite pastimes. Although participants viewed the films in a room by themselves, they were in communication with the experimenter via intercom over the course of the experiment and were aware that they were being videotaped throughout.

To test our hypotheses for Study 2, we used data from a multimethod project on emotion and personality (Gross & John, 1997).³ Several months after completing the BEQ measure of dispositional expressivity, participants returned to the laboratory and watched film clips designed to elicit amusement and sadness. These two emotions are representative exemplars of the broad domains of positive and negative emotion, and each is associated with clear signs of emotion-expressive behavior.

For amusement (elicited with a comedy film), we expected that the degree to which individuals felt amused would predict how much amusement they would express in their behavior and that this link would be observed for both dispositionally high- and low-expressivity individuals. For sadness (elicited with a film about a funeral), we expected the same interaction effect we had found for general negative emotion in Study 1: For dispositionally high-expressivity individuals, their experience of sadness during the funeral film should predict behavioral expressions of sadness. Dispositionally low-expressivity individuals, in contrast, were expected to increasingly modulate their expressive behavior as their emotional experience increased in intensity, effectively decoupling their experience of sadness from their expression of sadness in behavior. As predicted by the dynamic modulation model (see Figure 2), low-expressivity individuals should show little expressive behavior at any level of sadness experience.

Method

Participants. Seventy-four female undergraduates at a large West Coast university volunteered to participate to fulfill a requirement of an introductory psychology course. On average, participants were 19 years old ($SD = 1.0$ years). The ethnic composition of the sample was

comparable to that of the general student population (7% African American, 30% Asian American, 28% Caucasian, 18% Hispanic, and 17% other).

Procedure. Participants completed the BEQ, our measure of dispositional expressivity, as part of a general pre-testing survey. Approximately 2 months later, participants took part in an individual experimental session as part of a larger project (Gross & John, 1997). Upon arrival, participants were seated in a well-lit 3-meter $\times$ 6-meter room. They were informed that the experimenter was "interested in learning more about emotion" and that the session would be videotaped. To accustom them to the laboratory, participants first watched a film about flowers in a park. During the next three film trials, participants sat quietly during a 1-minute baseline period to minimize carryover effects and then watched the 3.5-minute film under the instructions to "watch the film carefully." After each film, participants completed a self-report inventory to describe their emotional experience during the film. The order of film presentation was counterbalanced, and all participants saw all three films on a 27-inch color television monitor at a distance of 1.75 meters. Instructions were prerecorded and presented via the television monitor.

Film stimuli. Four films were used. Each film had been pretested to determine the emotions it elicited (Gross & Levenson, 1995). The first film (1.5 minutes, soundless) shows flowers in a park and elicits emotion reports that are generally similar to baseline (Ekman, Friesen, & O'Sullivan, 1988). The comedy film (3.5 minutes, with sound) shows a comedy routine by Robin Williams (Morra, Brezner, & Gowers, 1986). This film elicits emotion reports of amusement with little other emotion. The neutral film (3.5 minutes, soundless) shows an abstract geometric display (ScreenPeace screensaver). The funeral film (3.5 minutes, with sound) shows a funeral scene with a distraught mother (Stark & Ross, 1989). It elicits emotion reports of sadness with little other emotion. For the present study, we examined responses to comedy and funeral films.

Subjective emotion experience. After viewing each film, participants rated how they had felt during the film using a standard set of 16 emotion terms (Gross & Levenson, 1995). Two of these terms were of interest for the present study: amusement and sadness. For each emotion, participants rated the greatest amount they had felt during the film on a 9-point rating scale (0 = *none*, 8 = *most in my life*).

Dispositional expressivity. We again used the Positive Expressivity ($\alpha = .67$) and Negative Expressivity ($\alpha = .65$) scales from the BEQ (Gross & John, 1995).

Emotion-expressive behavior. Participants' facial behavior and upper body movement were recorded unobtrusively by a remotely controlled high-resolution video camera placed behind darkened glass in a bookshelf. After the experimental session, participants' behavioral expressions were coded from videotape by four coders (two male, two female) who were blind to the films that participants were watching. Coders used a global behavioral coding system (Gross & Levenson, 1993) derived from Ekman and Friesen's (1975) description of specific behavioral expressions of emotions. For this study, the following six variables were used: (a) smiling, (b) overall amusement expression, (c) overall body movement during the amusement film, (d) crying, (e) overall sadness expression, and (f) overall intensity of expressive behavior during the sadness film. Smiling was measured as smiles per minute, whereas the other five measures were global ratings, whose values were determined by the intensity, duration, and frequency of response. Coding reliabilities were good (M interrater reliability = .85). Final values for each of the codes were determined by averaging each of the coder's ratings for a given participant's expressive behavior. Composites were created to represent overall amusement expressive behavior (smiling, amusement, and body movement; $\alpha = .85$) and overall sadness expressive behavior (crying, sadness, and intensity; $\alpha = .89$). For details, see Gross (1998a) and Gross and Levenson (1993, 1997).

Results and Discussion

Amusement expression during the comedy film. As presented in Table 3 (above the diagonal), momentary amusement experience and positive dispositional expressivity both correlated with the criterion measure, objectively coded amusement expressions. These substantial cross-method correlations replicate the pattern of findings observed in Study 1.

In the regression analysis, we predicted amusement-expressive behavior during the comedy film from experience of amusement, positive expressivity, and their interaction (created by standardizing and then multiplying the two predictors). The multiple R was .51 (.47 when corrected for shrinkage). As presented in Table 4, both experienced amusement ($\beta = .35$) and the BEQ Positive Expressivity scale ($\beta = .29$) were independent predictors. As in Study 1, their interaction was not significant ($\beta = .04$).

The left panel of Figure 3 shows these effects in standard (Z) score metric, computed as in Study 1. The main effect of positive expressivity is indicated by the separation of the two regression lines, and the main effect of emotional experience is indicated by the positive slope of the regression lines. Again, as in Study 1, the regression lines were essentially parallel (β s of .39 for high-

TABLE 3: Correlations Among Momentary Emotion Experience, Dispositional Expressivity (BEQ), and Coded Emotion-Expressive Behavior During the Comedy Film (above diagonal) and the Funeral Film (below diagonal)

	<i>Momentary Experience</i>	<i>Expressivity (BEQ)</i>	<i>Coded Emotion Behavior</i>
Momentary emotion experience	—	.17	.42*
Dispositional expressivity (BEQ)	.13	—	.35*
Coded emotion behavior	.45*	.39*	—

NOTE: $N = 74$. BEQ = Berkeley Expressivity Questionnaire (Gross & John, 1995); the Positive Expressivity scale was used above the diagonal (i.e., for the comedy film) and the Negative Expressivity scale was used below the diagonal (i.e., for the funeral film).

* $p < .05$ (two-tailed).

TABLE 4: Moderated Multiple Regression Results in Study 2: Predicting Emotion-Expressive Behavior During Films From Momentary Emotion Experience, Dispositional Expressivity, and Their Interaction

<i>Coded Expressive Behavior</i>	<i>Standardized Regression Weights (β)</i>		
	<i>Momentary Experience</i>	<i>Dispositional Expressivity</i>	<i>Experience $\times$ Expressivity</i>
Amusement (during comedy film)	.35*	.29*	.04
Sadness (during funeral film)	.40*	.36*	.25*

NOTE: $N = 74$. Dispositional expressivity was measured using the Positive and Negative Expressivity scales from the Berkeley Expressivity Questionnaire (Gross & John, 1995) for the comedy and funeral films, respectively.

* $p < .05$ (two-tailed).

expressivity and .31 for low-expressivity participants). Thus, the data provided clear support only for a fixed component in participants' modulation of amusement expression during the comedy film.

Sadness expression during the funeral film. Table 3 (below the diagonal) presents the relations among predictor and criterion measures. Once again, momentary experience and dispositional expressivity were both related to objectively coded sadness expression. The crucial question in Study 2, however, was whether we would replicate for sadness the hypothesized interaction effect we had obtained for negative emotion in Study 1. We tested this hypothesis using a moderated regression analysis. The multiple R was .61 (.59 when corrected for shrinkage), and both experienced sadness ($\beta = .40$) and negative expressivity ($\beta = .36$) were independent predictors (see Table 4). Most important, however, was the finding that

the interaction effect was positive and significant ($\beta = .25$) and closely replicated the findings from Study 1 in both direction and size of the interaction.

The right panel of Figure 4 shows these effects in standard (Z) score metric. The interaction effect (indicated here by the difference in the slopes of the two regression lines) illustrates the moderator effect predicted by the dynamic modulation model. For dispositionally high-expressivity participants, the relation between experienced and expressed emotion was substantially stronger ($\beta = .65$) than for relatively low-expressivity participants ($\beta = .15$). Thus, for dispositionally high-expressivity participants, sadness expressed in the laboratory situation was predicted by both the momentary experience of sadness and dispositional expressivity. For dispositionally low-expressivity participants, however, the experience of sadness was essentially unrelated to the behavioral expression of sadness.

GENERAL DISCUSSION

The findings from both studies support our expectation that, in general, emotion experience and emotion expression should be related positively but that the rules governing how experience and expression are related should differ for positive and negative emotions.

Emotion Experience, Dispositional Expressivity, and Emotion-Expressive Behavior

For positive emotion, experience and dispositional expressivity were substantially and independently related to emotion-expressive behavior. This was true whether we examined general positive emotion (Study 1) or the specific positive emotion of amusement (Study 2). For negative emotion, however, the story was more complicated. Again, both experience and dispositional expressivity had main effects, but they also interacted: Emotion experience predicted emotion expression for dispositionally high-expressivity individuals but not for dispositionally low-expressivity individuals. This finding held for both general negative emotion (Study 1) and the specific negative emotion of sadness (Study 2).

Note that the two studies differed importantly in design and measures. Study 1 measured emotion experience in habitual and general terms; Study 2 measured emotion experience in momentary and discrete terms. The criterion in Study 1 was based on multiple peer informants and thus reflected emotion expression aggregated over time and many social situations; Study 2 used objectively coded emotion-expressive behavior observed during film viewing in one laboratory situation. Yet, when one compares Tables 2 and 4, or Figures 3 and 4, the similarity in findings is striking, particularly

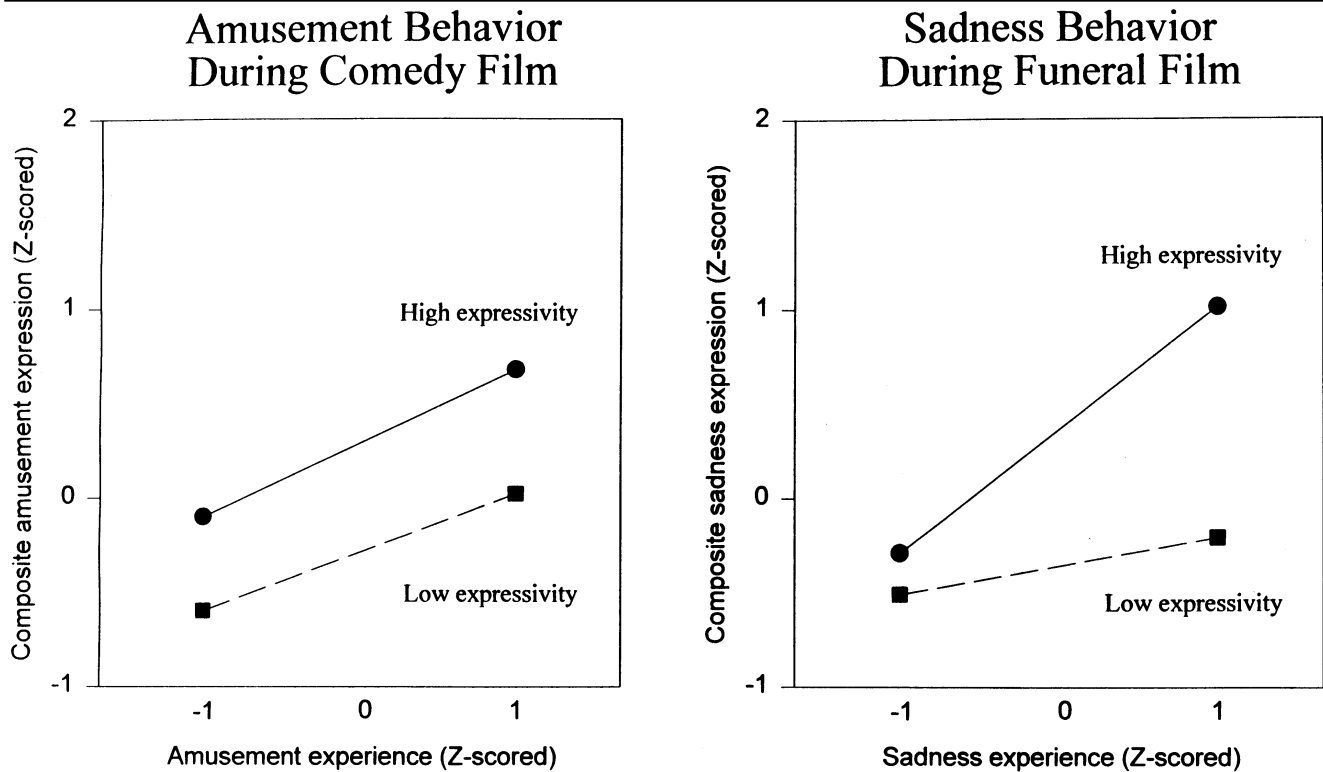


Figure 4 Study 2: Relations of momentary emotion experience and dispositional expressivity to the behavioral expression of amusement and sadness during films.

for the crucial interaction effect for negative emotion (see the right panel of Figures 3 and 4). Given how difficult it is to replicate interaction effects (Chaplin, 1997; Wiggins, 1973), this replication of the hypothesized interaction for negative emotion gives us some measure of confidence.⁴ Clearly, there is some merit to our hypothesis that the relation between emotion experience and expression varies according to the valence of the target emotion.

Implications and Future Directions

Moving from dispositions to processes. Measures of dispositional expressivity, as conceptualized in these and in previous studies, are relatively distal, that is, they do not capture specific personality processes as they unfold over relatively short periods of time. Nonetheless, our findings clearly show that when low-expressivity individuals experience negative emotion they do something different from high-expressivity individuals. What exactly are they doing? One hypothesis is suggested by the content of some of the items that define the negative expressivity dimension. For example, consider the low-expressivity item, "I've learned it's better to suppress my anger than to show it" (Gross & John, 1995). This item

refers explicitly to one form of emotion regulation that low-expressivity individuals may use—emotional suppression, defined as the conscious inhibition of emotion-expressive behavior (Gross & Levenson, 1993).

But are low-expressivity individuals really as aware of their ongoing efforts at emotion regulation as this definition of emotional suppression suggests? The fact that they endorse items specifically concerned with suppression suggests that they do have some general awareness of their emotion regulatory tendencies. But this does not necessarily mean that low-expressivity individuals are consciously using suppression to inhibit their expressive behavior in specific situations. For example, Lanzetta and Kleck (1970) hypothesized that low levels of behavioral expression may come about automatically and with little reflection because low-expressivity "individuals have, during the course of their socialization, been punished for engaging in overt displays of emotionality and have learned to inhibit such displays" (p. 18). Note that the dissociation of expression from experience for low-expressivity individuals was the same whether we considered their social interactions with peers (Study 1) or their behavior in a much less interactive laboratory situation (Study 2). Thus, emotion regulatory processes of low-expressivity individuals may be internalized to such a

degree that these processes are invoked relatively automatically rather than executed consciously and deliberately.

To test whether and to what extent low-expressivity individuals are aware of their ongoing emotion regulation, researchers may need to ask them directly about their emotion regulation. Self-report methodologies have been applied to the study of emotion regulation with some success (e.g., Gross & Richards, 2000; Thayer, Newman, & McClain, 1994), suggesting the potential value of probing participants more directly about their ongoing efforts at emotion regulation. However, we expect there to be limits to research participants' ability to report on ongoing emotion regulation, particularly with respect to regulatory processes that are less accessible to consciousness, such as repressive coping (Weinberger, 1990). In other cases, however, such as emotional suppression, we are more optimistic that direct probes will shed important new light on the emotion modulatory filter portrayed in Figure 1.

Another route to clarifying the emotion regulatory processes that underlie individual differences in expressivity would be to directly instruct research participants to suppress emotion-expressive behavior (cf. Gross, 1998a). If the primary difference between low- and high-expressivity individuals is that low-expressivity individuals are usually more motivated to suppress emotion-expressive behavior, such an instructional set should eliminate any habitual differences in motivation and thus eliminate any personality differences, both in expressive behavior and in the relation between emotion experience and expression. An alternative conception, however, would be that low-expressivity individuals have unique emotion-suppression skills. In this case, explicit instructions to suppress emotion-expressive behavior should leave intact group differences both in emotion-expressive behavior and in the relation between emotion experience and expression because high-expressivity individuals would lack the skills to effectively suppress their emotional behavior even when they are motivated to do so.

Both self-report-based probes into emotion regulation strategies and direct instructions to suppress ongoing emotion-expressive behavior are likely to yield important new insights regarding the differences between dispositionally low- and high-expressivity individuals. This combination of approaches will help clarify when indirect approaches (i.e., assessment of individual differences) are necessary and when more direct assessments of emotion regulation may be possible.

Moving beyond the negative-positive dichotomy. The ongoing debate about whether emotion experience is related to emotion expression implies that one general, all-

purpose model should be sufficient to account for the complex relations between experience and expression. Our findings call this assumption into question and instead raise the possibility that any complete account of the experience-expression link needs to address at the very minimum (a) the role of dispositional expressivity and (b) whether the emotion in question is positive or negative.

Indeed, we suspect that even the positive-negative dichotomy may prove too imprecise a distinction to capture the phenomenon at hand. For example, we can imagine situations in which culturally sanctioned display rules call on the individual to inhibit the expression of positive emotions, such as joy and pride after winning a game. If low-expressivity individuals are as sensitive to these display rules as they are to others we have considered, should we not also expect an interaction between positive emotion experience and expressivity similar to that obtained in the present studies for general negative emotion and for sadness? One can also imagine situations in which it would be appropriate to not inhibit negative emotions, such as directly expressing anger when being bullied in front of one's peers. In this case, even the most inexpressive individual may express anger, and we might expect little or no interaction between emotion experience and dispositional expressivity.

One interesting research direction will be to study whether specific situational influences can in fact override the general positive-negative asymmetry we have demonstrated in the present studies. For example, researchers might design experimental situations that, similar to the examples above, define or emphasize display rules that go against the typically stronger restriction of negative rather than positive expression (e.g., Cole, 1986; Friedman & Miller-Herringer, 1991). If we can create specific contexts that make desirable the inhibition of positive emotion or the expression of negative emotion, will experience-expression links be altered? As described above, researchers also might manipulate display rules directly by instructing research participants to hide or to express fully their emotions in a particular situation (e.g., Gross, 1998a). If we find that low-expressivity individuals can fully express their negative emotions, and high-expressivity individuals can fully suppress their negative emotions, then we may conclude that both groups are aware of and can voluntarily override their typical expressive tendencies.

Manipulating emotion regulatory processes within individuals, either by changing the salience of implicit display rules or by direct instruction, will permit much stronger inferences about the correlates and consequences of specific forms of emotion regulation. What the field now needs is a thorough analysis of the specific regulatory processes that individuals employ to influ-

ence their emotional responses. Research on personality and emotion promises to help bridge the gap between individual differences and the specific processes that give rise to these individual differences in behavior.

NOTES

1. We are by no means the first to notice that the phrase "emotional expression" implies that emotion-expressive behavior is expressive of inner feelings (Hinde, 1985). Previous reviewers have handled the phrase "emotional expression" in various ways. Adelman and Zajonc (1989) studiously avoided the term "facial expression" and instead used "facial efferece." Others have referred to "nonverbal sending accuracy" (Buck, Savin, Miller, & Caul, 1972) or "facial displays" (Chovil, 1991). As Ekman (1993) notes, he tried for years to avoid the phrase, instead using "facial behavior." Recently, however, he has reverted to using the more natural phrase "facial expression."

2. There is some debate (see Aiken & West, 1991) whether the predictor variables should only be centered (rather than standardized), thus retaining the original metrics and interpreting unstandardized regression coefficients. In the present research, we used standard scores to ensure that findings could be compared across measures and studies using rather different measures and metrics.

3. Part of these data were analyzed in Gross and John's (1997) Study 3 to examine the validity of the Berkeley Expressivity Questionnaire (BEQ) scales. In contrast, the present analyses focused on the potentially interactive effects of experience and dispositional expressivity on emotion expression; these hypotheses were neither tested nor discussed by Gross and John (1997).

4. We also considered potential statistical artifacts, but our data showed no evidence of differential reliabilities of the predictors or differences in variances. In Study 1, for example, the standard deviations were not smaller for the positive emotion predictors: Both PANAS Positive and Negative Affect scales had *SDs* of .67; the *SDs* for the BEQ scales were .98 for the Positive Expressivity scale and .91 for the Negative Expressivity scale. Differential reliabilities also could not explain our findings: Alphas for the PANAS Positive and Negative Affect scales were .89 and .88, respectively; alphas for the BEQ scales were .73 for the Positive Expressivity scale and .67 for the Negative Expressivity scale. Nonetheless, one feature of our data that probably helped us achieve a strong test of our moderator hypothesis (Chaplin, 1997, p. 881) was that the two predictors were essentially unrelated (see Tables 1 and 3).

REFERENCES

- Adelman, P. K., & Zajonc, R. B. (1989). Facial efferece and the experience of emotion. *Annual Review of Psychology*, 40, 249-280.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Arnold, M. B. (1960). *Emotion and personality* (Vols. 1 & 2). New York: Columbia University Press.
- Averill, J. R. (1982). *Anger and aggression: An essay on emotion*. New York: Springer-Verlag.
- Blumberg, S. H., & Izard, C. E. (1991). Patterns of emotion experiences as predictions of facial expressions of emotion. *Merrill-Palmer Quarterly*, 37, 183-197.
- Buck, R., Savin, V., Miller, R. E., & Caul, W. F. (1972). Nonverbal communication of affect in humans. *Journal of Personality and Social Psychology*, 23, 362-371.
- Burrows, B. D., & Halberstadt, A. G. (1987). Self- and family-expressiveness styles in the experience and expression of anger. *Journal of Nonverbal Behavior*, 11, 254-268.
- Cacioppo, J. T., Martzke, J. S., Petty, R. E., & Tassinary, L. G. (1988). Specific forms of facial EMG response index emotions during an interview: From Darwin to the continuous flow hypothesis of affect-laden information processing. *Journal of Personality and Social Psychology*, 54, 592-604.
- Casey, R. J. (1993). Children's emotional experience: Relations among expression, self-report, and understanding. *Developmental Psychology*, 29, 119-129.
- Caspi, A., & Bem, D. (1990). Personality continuity and change across the life course. In L. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 549-575). New York: Guilford.
- Chaplin, W. F. (1997). Personality, interactive relations, and applied psychology. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 873-890). San Diego, CA: Academic Press.
- Chovil, N. (1991). Social determinants of facial displays. *Journal of Nonverbal Behavior*, 15, 141-154.
- Cole, P. M. (1986). Children's spontaneous control of facial expression. *Child Development*, 57, 1309-1321.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO-Five Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology*, 69, 130-141.
- Dimberg, U. (1988). Facial electromyography and the experience of emotion. *Journal of Psychophysiology*, 2, 277-282.
- Ekman, P. (1972). Universal and cultural differences in facial expressions of emotion. In J. R. Cole (Ed.), *Nebraska symposium on motivation*, 1971 (pp. 207-283). Lincoln: University of Nebraska Press.
- Ekman, P. (1993). Facial expression and emotion. *American Psychologist*, 48, 384-392.
- Ekman, P., & Friesen, W. V. (1969). The repertoire of nonverbal behavior: Categories, origin, usage, and coding. *Semiotica*, 1, 49-98.
- Ekman, P., & Friesen, W. V. (1975). *Unmasking the face: A guide to recognizing emotions from facial clues*. Englewood Cliffs, NJ: Prentice Hall.
- Ekman, P., Friesen, W. V., & O'Sullivan, M. (1988). Smiles when lying. *Journal of Personality and Social Psychology*, 54, 414-420.
- Eysenck, H. J. (1990). Biological dimensions of personality. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 244-276). New York: Guilford.
- Fernandez-Dols, J. M., & Ruiz-Belda, M. A. (1995). Are smiles a sign of happiness? Gold medal winners at the Olympic games. *Journal of Personality and Social Psychology*, 69, 1113-1119.
- Fernandez-Dols, J. M., Sanchez, F., Carrera, P., & Ruiz-Belda, M. A. (1997). Are spontaneous expressions and emotions linked? An experimental test of coherence. *Journal of Nonverbal Behavior*, 21, 163-177.
- Fridlund, A. J. (1994). *Human facial expression*. San Diego, CA: Academic Press.
- Fridlund, A. J., Kenworthy, K. G., & Jaffey, A. K. (1992). Audience effects in affective imagery: Replication and extension to dysphoric imagery. *Journal of Nonverbal Behavior*, 16, 191-212.
- Friedman, H. S., & Miller-Herringer, T. (1991). Nonverbal display of emotion in public and in private: Self-monitoring, personality, and expressive cues. *Journal of Personality and Social Psychology*, 61, 766-775.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74, 224-237.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2, 271-299.
- Gross, J. J., & Richards, J. M. (2000). *Emotion regulation in everyday life: Sex, ethnicity, and social context*. Manuscript in preparation.
- Gross, J. J., & John, O. P. (1995). Facets of emotional expressivity: Three self-report factors and their correlates. *Personality and Individual Differences*, 19, 555-568.
- Gross, J. J., & John, O. P. (1997). Revealing feelings: Facets of emotional expressivity in self-reports, peer ratings, and behavior. *Journal of Personality and Social Psychology*, 72, 435-448.
- Gross, J. J., & John, O. P. (1998). Mapping the domain of emotional expressivity: Multi-method evidence for a hierarchical model. *Journal of Personality and Social Psychology*, 74, 170-191.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, 64, 970-986.
- Gross, J. J., & Levenson, R. W. (1995). Emotion elicitation using films. *Cognition and Emotion*, 9, 87-108.
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*, 106, 95-103.

- Gross, J. J., Sutton, S. K., & Ketelaar, T. V. (1998). Relations between affect and personality: Support for the affect-level and affective-reactivity views. *Personality and Social Psychology Bulletin*, 24, 279-288.
- Hall, J. A. (1979). Gender, gender roles, and nonverbal communication. In R. Rosenthal (Ed.), *Skill in nonverbal communication* (pp. 32-67). Cambridge, MA: Oelgeschlager, Gunn & Hain.
- Hess, U., Banse, R., & Kappas, A. (1995). The intensity of facial expression is determined by underlying affective state and social situation. *Journal of Personality and Social Psychology*, 69, 280-288.
- Hinde, R. A. (1985). Was 'the expression of the emotions' a misleading phrase? *Animal Behavior*, 33, 985-992.
- Izard, C. E. (1971). *The face of emotion*. New York: Appleton-Century-Crofts.
- Izard, C. E. (1977). *Human emotions*. New York: Plenum.
- Jancke, L. (1993). Different facial EMG-reactions of extraverts and introverts to pictures with positive, negative and neutral valence. *Personality and Individual Differences*, 14, 113-118.
- Jones, H. (1950). The study of patterns of emotional expression. In M. L. Reymert (Ed.), *Feelings and emotions* (pp. 161-168). New York: McGraw-Hill.
- Kappas, A. (1997). The fascination with faces: Are they windows to our soul? *Journal of Nonverbal Behavior*, 21, 157-161.
- King, L. A., & Emmons, R. A. (1990). Conflict over emotional expression: Psychological and physical correlates. *Journal of Personality and Social Psychology*, 58, 864-877.
- Kring, A. M., & Gordon, A. H. (1998). Sex differences in emotion: Expression, experience, and physiology. *Journal of Personality and Social Psychology*, 74, 686-703.
- Kring, A. M., Smith, D. A., & Neale, J. M. (1994). Individual differences in dispositional expressiveness: Development and validation of the Emotional Expressivity Scale. *Journal of Personality and Social Psychology*, 66, 934-949.
- Lang, P. J. (1995). The emotion probe: Studies of motivation and attention. *American Psychologist*, 50, 372-385.
- Lanzetta, J. T., & Kleck, R. E. (1990). Encoding and decoding of nonverbal affect in humans. *Journal of Personality and Social Psychology*, 16, 12-19.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- Levenson, R. W. (1994). Human emotion: A functional view. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion* (pp. 123-126). New York: Oxford University Press.
- Leventhal, H. (1984). A perceptual motor theory of emotion. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion* (pp. 271-292). Hillsdale, NJ: Lawrence Erlbaum.
- McHugo, G. J., & Smith, C. A. (1996). The power of faces: A review of John T. Lanzetta's research on facial expression and emotion. *Motivation and Emotion*, 20, 85-120.
- McIntosh, D. N. (1996). Facial feedback hypotheses: Evidence, implications, and directions. *Motivation and Emotion*, 20, 121-147.
- Mischel, W., & Peake, P. K. (1982). Beyond déjà vu: In the search for cross-situational consistency. *Psychological Review*, 89, 730-755.
- Morra, B. P., Brezner, L. P., & Gowers, B. D. (1986). *Robin Williams live* [Film]. Stamford, CT: Vestron Video.
- Plutchik, P. (1980). *Emotion: A psychoevolutionary synthesis*. New York: Harper & Row.
- Rosenberg, E. L., & Ekman, P. (1994). Coherence between expressive and experiential systems in emotion. *Cognition and Emotion*, 8, 201-229.
- Rothbart, M. K., & Ahadi, S. A. (1994). Temperament and the development of personality. *Journal of Abnormal Psychology*, 103, 55-66.
- Scheier, M. F., & Carver, C. S. (1993). On the power of positive thinking: The benefits of being optimistic. *Current Directions in Psychological Science*, 2, 26-30.
- Scherer, K. R. (1984). On the nature and function of emotion: A component process approach. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion* (pp. 293-318). Hillsdale, NJ: Lawrence Erlbaum.
- Schwartz, G. E., Fair, P. L., Salt, P., Mandel, M. R., & Klerman, G. L. (1976). Facial expression and imagery in depression: An electromyographic study. *Psychosomatic Medicine*, 38, 337-347.
- Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, 30, 526-537.
- Stark, R. P., & Ross, H. D. (1989). *Steel magnolias* [Film]. Burbank, CA: Columbia/Tri-Star.
- Stemmler, G. (1997). Selective activation of traits: Boundary conditions for the activation of anger. *Personality and Individual Differences*, 22, 213-233.
- Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681-706). Hillsdale, NJ: Lawrence Erlbaum.
- Thayer, R. E., Newman, J. R., & McClain, T. M. (1994). Self-regulation of mood: Strategies for changing a bad mood, raising energy, and reducing tension. *Journal of Personality and Social Psychology*, 67, 910-925.
- Tomkins, S. S. (1962). *Affect, imagery, consciousness: Vol. 1. The positive affects*. New York: Springer.
- Watson, D., & Clark, L. A. (1991). Self- versus peer ratings of specific emotional traits: Evidence of convergent and discriminant validity. *Journal of Personality and Social Psychology*, 60, 927-940.
- Watson, D., & Clark, L. A. (1994). *Manual for the Positive and Negative Affect Schedule (expanded form)*. Unpublished manuscript, University of Iowa.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.
- Weinberger, D. A. (1990). The construct validity of the repressive coping style. In J. L. Singer (Ed.), *Repression and dissociation: Implications for personality theory, psychopathology, and health* (pp. 337-386). Chicago: University of Chicago Press.
- Wiggins, J. S. (1973). *Personality and prediction: Principles of personality assessment*. Reading, MA: Addison-Wesley.
- Williams, D. G. (1982). Weeping by adults: Personality correlates and sex differences. *Journal of Psychology*, 110, 217-226.

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