

Don't Worry, Be Happy? Neuroticism, Trait-Consistent Affect Regulation, and Performance

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People regulate their affect either to feel good or to achieve instrumental success. The present experiments show that when driven by performance goals, people can be motivated to experience unpleasant affect when it is trait-consistent, because of its instrumental benefits (e.g., M. Tamir & M. D. Robinson, 2004). In 4 studies, individuals high in neuroticism were more likely than those low in neuroticism to choose to increase their level of worry, as indicated by self-reported preferences (Study 1) and by behavioral choices in experimental settings (Studies 2–4). As predicted, such preferences were evident when expecting to perform demanding tasks but not when expecting an undemanding task (Study 2). Study 4 suggests that such preferences for short-term unpleasant affect may be beneficial to performance.

Keywords: affect/emotion regulation, neuroticism, performance, motivation

In theory, affect regulation could involve increasing positive feelings, decreasing positive feelings, increasing negative feelings, and decreasing negative feelings (Carver & Scheier, 1998; Gross, 1998, 1999). So far, however, there has been limited evidence for cases in which people are motivated to increase their unpleasant feelings (e.g., Bonanno, 2001). By considering both hedonic and instrumental outcomes, the present research sought to demonstrate a case in which people are motivated to increase their unpleasant feelings in the short term to obtain long-term benefits.

Hedonic and Instrumental Motives for Affect Regulation

Following Gross (1998), *affect regulation* is defined as involving processes by which individuals influence their subjective emotional experiences (see also R. J. Larsen, 2000; Parkinson, Totterdell, Briner, & Reynolds, 1996). One approach to affect regulation suggests that it is driven primarily by immediate affective considerations (R. J. Larsen, 2000). Specifically, people are motivated to seek pleasure and avoid pain, and therefore they attempt to increase or maintain positive emotions and to decrease negative emotions at any given moment (R. J. Larsen, 2000; Thayer, 2000; Tice, Baumeister, & Zhang, 2004; Tice & Bratslavsky, 2000). This approach governs much of the research in the field (Gross, 1998; Krohne, Pieper, Knoll, & Breimer, 2002; R. J. Larsen, 2000; Parkinson et al., 1996; Thayer, 1996).

Recent empirical findings, however, suggest that a simple short-term hedonic principle is not sufficient to account for all affect regulatory processes (Erber & Erber, 2000; Fischer, Manstead, Evers, Timmers, & Valk, 2004; Hirt & McCrea, 2000; Martin, 2000). Instead, people may choose to experience certain affective states for reasons other than immediate hedonic outcomes (e.g., Erber & Erber, 2000). For example, people may choose to experience a specific affective state (e.g., happiness) to obtain specific instrumental goals (e.g., make a partner jealous) that may or may not entail immediate hedonic gratification.

Based on this approach, people can be motivated to achieve positive outcomes (i.e., instrumental success) rather than positive feelings per se (Frijda, 1999; Martin, 2000; Parrott, 1993). When the goal of affect regulation is to obtain positive outcomes in a given situation, people should be motivated to experience any affect that leads to instrumental success. It is therefore the motivational implications of one's affect, and not only its valence, that determine affect regulatory motives (Clore & Robinson, 2000; Martin, 2000; Martin & Davies, 1998).

The immediate outcomes of affect regulation, therefore, can vary according to their hedonic nature (i.e., pleasant vs. unpleasant) and according to their pragmatic nature (i.e., instrumental vs. not). Increased positive affect leads to hedonic benefits, but it often leads to instrumental benefits as well (for a review, see Aspinwall, 1998; Isen, 2000). Therefore, when people increase their positive affect, they may do so to feel good, to obtain instrumental benefits, or both. To demonstrate that affect regulation is not driven exclusively by short-term hedonic considerations, the present research examined a case in which unpleasant, rather than pleasant, affect leads to instrumental benefits.

The Instrumental Benefits of Trait-Consistent Affect

Positive and negative emotional experiences have been consistently linked to extraversion and neuroticism, respectively (e.g., Costa & McCrae, 1980; Lucas & Fujita, 2000). In the case of extraversion, positive emotional experiences are both trait-consistent and pleasant. However, in the case of neuroticism,

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negative emotional experiences are trait-consistent but unpleasant. The present studies focus on individual differences in neuroticism, because it enables one to disentangle short-term hedonic motives from instrumental motives in affect regulation. This approach is based on the assumption that even unpleasant negative states (e.g., worry) can be beneficial in people for whom they are trait-consistent (i.e., individuals high in neuroticism).

Recent empirical evidence demonstrates that trait-consistent affective states can indeed lead to instrumental benefits. For example, Tamir, Robinson, and Clore (2002) have shown that extraverts (vs. introverts) were faster to make motivationally relevant distinctions when in a positive (vs. a neutral) mood state. More remarkably, individuals high (vs. low) in neuroticism were faster to make valenced distinctions when in a negative (vs. a neutral) mood state (Tamir & Robinson, 2004). This suggests that despite their unpleasant nature, negative states may be beneficial for individuals high in neuroticism. One possible account for such findings focuses on the synchronization of motivational cues.

Specifically, people are motivated to use goal pursuit means that are congruent with their stable motivational orientation (Higgins, 2000). Such a regulatory fit increases task engagement and enhances actual performance (Camacho, Higgins, & Luger, 2003; Shah, Higgins, & Friedman, 1998). In this respect, the approach and avoidance motivation systems are linked to both state and trait affect. For example, an engaged approach system is reflected by feelings of elation and happiness, whereas an engaged avoidance system is reflected by feelings of anxiety and worry (Carver & Scheier, 1998; Higgins, 1987; Watson, Wiese, Vaidya, & Tellegen, 1999).¹ Happiness and worry, therefore, relate to specific behavioral means of goal attainment (i.e., approach and avoidance, respectively).

The approach and avoidance systems are also linked to extraversion and neuroticism, respectively (e.g., Depue & Collins, 1999; Elliot & Thrash, 2002; Gray, 1981; Tellegen, 1985). Specifically, neuroticism has been linked to an active avoidance system (Carver, Sutton, & Scheier, 2000; Elliot & Thrash, 2002; Watson, 2000) and likely reflects stable individual differences in the tendency to avoid threats and punishments.

Whereas neuroticism reflects a stable motivational orientation, affective states reflect concurrent motivational cues. Therefore, for an individual high in neuroticism (i.e., one motivated to avoid negative outcomes), worry provides a congruent motivational cue (e.g., "do not fail this exam"), whereas happiness, which signals approach (e.g., "do well on this exam"), does not. Consistent with the notion of regulatory fit, a match between trait and state affect should lead to greater task engagement and, subsequently, to improved task performance. This should be the case when trait-consistent affective states reflect an active motivational system (e.g., worry but not sadness). Therefore, individuals high in neuroticism may be more engaged in effortful performance when worried.

Situational Determinants of Affect Regulatory Motives

If people are motivated to perform well on a task, they might prefer to experience trait-consistent affect. Someone high in neuroticism might sacrifice immediate pleasure in the short term to optimize subsequent performance. Given that regulatory fit increases effort, and effort is related to perceived task demand

(Gendolla, 2000), preferences for trait-consistent affect should be particularly evident in demanding situations, in which effort is necessary for adequate performance.

Overall, the current framework predicts that in cognitively effortful situations, individuals high (vs. low) in neuroticism would be motivated to experience a trait-consistent negative state (i.e., worry), even if it is unpleasant. This is, potentially, because such trait-consistent states might enhance performance. Four studies were designed to demonstrate a willingness to experience such short-term unpleasant feelings.

Study 1

In Study 1, participants were presented with a list of situations and were asked to rate the extent to which they preferred to experience happiness, worry, and sadness in each situation. Participants rated their preferences for each affective state separately. Therefore, in this context, the term *prefer* refers to choosing to experience some degree of a certain feeling, rather than choosing to experience some feeling over another. To examine whether trait-consistent motives for affect regulation are evident only in effortful performance situations, the survey included situations that were either cognitively demanding or not.

In addition, to test the generality of trait-consistent motives, situations in the survey were either social or private. Including both cognitive demand and sociability as situational categories was important, given that there is evidence that both are linked to affect regulation (e.g., Cunningham, 1998; Erber & Erber, 2000). I predicted that neuroticism would be related to higher preferences for worry in cognitively demanding (vs. undemanding) situations. On the other hand, I did not expect relations between neuroticism and preferences for worry to vary as a function of social versus private situations.

Because the effects of trait-consistent affect on performance were assumed to derive from motivational congruence, worry and happiness were chosen to reflect trait-consistent (vs. inconsistent) feelings that also signal engaged motivational systems (avoidance and approach, respectively). I hoped to demonstrate that such preferences are not driven solely by the valence of the affective state (i.e., neuroticism = negative), so the participants were also asked to rate the extent to which they would prefer to experience sadness in each situation. Ratings of preferred sadness were not expected to vary as a function of situational context and neuroticism.

Finally, the present framework suggests that affective preferences may vary as a function of neuroticism and situational context. However, online feelings can also influence affective choices (Erber & Erber, 1994; Forgas, Ciarrochi, & Moylan, 2000; Wegener & Petty, 1994). Given that neuroticism is linked to on-going affective experiences (Costa & McCrae, 1980), it was important in

¹ Some have argued that active approach is particularly related to positive, high arousal states (e.g., Watson et al., 1999). Recent evidence, however, suggests that active approach may also be related to certain kinds of negative affect, such as anger (e.g., Carver, 2004; Harmon-Jones, 2003; Harmon-Jones & Allen, 1998). Further pursuit of this issue is beyond the scope of this article. Instead, the present investigation focuses on worry, which is related by consensus to active avoidance as well as to neuroticism.

the present context to control for online affect. Therefore, in Study 1, participants also rated their concurrent feelings.

Method

Participants

Participants were 47 undergraduate students (70% females; average age = 18.70 years) at the University of Illinois, who participated in return for partial credit toward an introductory psychology course requirement.

Materials

Emotional preferences survey. The survey was designed to include typical exemplars of each cell in the 2 (social vs. private) \times 2 (cognitively demanding vs. not) dimensional space. To pick situations that best represent these dimensions, I first conducted a pilot test of items. Specifically, participants ($N = 12$) rated the degree to which they viewed each situation as private versus social (1 = *highly private*; 6 = *highly social*) and as cognitively demanding versus undemanding (1 = *not cognitively demanding*; 6 = *very cognitively demanding*). Situations that were rated above (vs. below) the midpoint on the sociability scale were considered social (vs. private) situations, and situations that were rated above (vs. below) the midpoint on the cognitive demand scale were considered cognitively demanding (vs. undemanding). The survey included only situations on which there was above 75% agreement in categorizations of both sociability and cognitive demand. This resulted in 4 situations for each of the following situational categories: private–undemanding (e.g., washing the dishes), private–demanding (e.g., taking a test), social–undemanding (e.g., going out with friends), and social–demanding (e.g., participating in a group discussion).² The resulting emotional preferences survey included 16 situations presented in a random order. Participants were asked to separately indicate on 7-point scales (1 = *not at all*; 7 = *extremely*) the degree to which they prefer to feel happy, worried, and sad in each situation (e.g., “When taking a test, to what extent would you prefer to feel worried?”). Preferences for situations representing the same underlying category (i.e., private–undemanding, private–demanding, social–undemanding, social–demanding) were averaged to form aggregated preference scores for happiness, worry, and sadness (α s ranged from .62 to .80).

Neuroticism scale. Neuroticism was measured by Goldberg’s (1999) Big Five International Personality Item Pool scale (short form). The scale involves agreeing or disagreeing with statements indicative of high or low neuroticism (e.g., “I get stressed out easily”). For evidence on the reliability and validity of the scale, see Goldberg (1999). Cronbach’s alpha for the current sample was .88.

Affect scale. Participants were asked to rate their current feelings, on a 5-point scale (1 = *very slightly to not at all*; 5 = *extremely*). Adjectives were chosen on the basis of R. J. Larsen and Diener’s (1992) analysis of the circumplex model of emotion. Ratings of *happy*, *up*, and *enthusiastic* were averaged to estimate online happiness; ratings of *anxious* and *worried* were averaged to estimate online worry; and ratings of *sad*, *down*, and *depressed* were averaged to estimate online sadness.

Procedure

Participants completed the study in groups of 4–5. After they were seated in private cubicles, they completed the affect and personality scales. Following the completion of an unrelated task that lasted 5 min, they completed the emotional preferences survey.

Results

To examine the relationship between neuroticism and affective preferences, I conducted a repeated measures analysis using gen-

eral linear modeling (i.e., PROC GLM REPEATED in SAS 8.02; SAS Institute, Cary, NC). Gender was entered as a between-subjects factor; neuroticism, online happiness, online worry, and online sadness were centered (Aiken & West, 1991) and entered as covariates, thus permitting use of the full range of scores in each. The situational stimulus categories (i.e., social–demanding, social–undemanding, private–demanding, private–undemanding) were treated as two crossed within-subjects factors. Preference ratings were examined in three separate analyses, one focused on ratings for happiness, one on ratings for worry, and one on ratings for sadness. The structure of this design permits interactions between neuroticism and within-subjects variables (e.g., cognitive demand).

In the analysis that included preference ratings for happiness, there was a significant effect for online happiness, $F(1, 41) = 4.53$, $p < .05$, so that greater online happiness was related to lower preferences for happiness ($\beta = -.33$). However, there was also a significant Neuroticism \times Cognitive Demand interaction, $F(1, 41) = 6.30$, $p < .05$. All other effects on preferred happiness ratings were not significant (F s < 2.3). To explore the nature of the Neuroticism \times Cognitive Demand interaction, I ran two additional multiple regressions, predicting preferences for happiness in either demanding situations (i.e., social–demanding and private–demanding) or undemanding situations (i.e., social–undemanding and private–undemanding), with the predictors included in the previous analyses. Neuroticism was negatively related to preferences for happiness in cognitively demanding situations ($\beta = -.29$) and was positively related to preferences for happiness in undemanding situations ($\beta = .18$). However, each of these effects was not significant in itself (F s < 2.4). The above regression equations were used to estimate mean preferences for participants higher in neuroticism (+1 SD) and for those lower in neuroticism (–1 SD). Figure 1 presents mean preferences for happiness in cognitively demanding versus undemanding situations as a function of neuroticism.

In the analysis that included preference ratings for worry, there was a marginal effect for neuroticism, $F(1, 41) = 3.85$, $p < .07$, so that higher neuroticism was related to higher preferences for worry ($\beta = .36$). However, as predicted, the above effect was qualified by a significant Neuroticism \times Cognitive Demand interaction, $F(1, 41) = 8.31$, $p < .01$. All other effects were not significant (F s < 2.6). Following the procedure described above, two additional multiple regressions were conducted predicting preferences for worry in either demanding or undemanding situations. As predicted, neuroticism was a significant predictor of preferred worry in cognitively demanding situations, $\beta = .41$, $F(1, 41) = 6.07$, $p < .05$, but not in undemanding situations ($\beta = .09$, $F < 1$). The above regression equations were used to estimate mean preferences for participants higher in neuroticism (+1 SD) and for those lower in neuroticism (–1 SD). Figure 1 also presents mean

² Participants in the pilot test also rated each situation in terms of pleasantness (1 = *very unpleasant*; 6 = *very pleasant*) and familiarity (1 = *very rare*; 6 = *very common*) to ensure that the chosen situations did not vary by these dimensions. Subsequent analyses found a significant effect for sociability on familiarity ratings, $F(1, 15) = 5.62$, $p < .05$, with private situations rated more common ($M = 4.50$) than social situations ($M = 3.55$). All other effects and interactions were not significant (F s < 1.4).

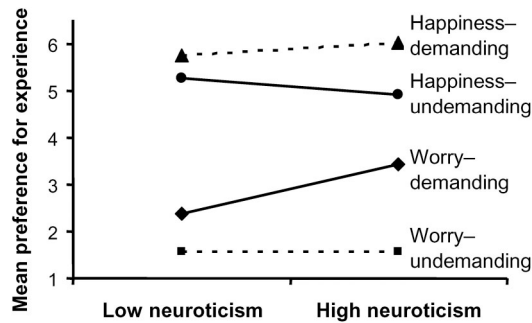


Figure 1. Preferences for experiencing worry and happiness in cognitively demanding and undemanding situations as a function of neuroticism (Study 1).

preferences for worry in cognitively demanding versus undemanding situations as a function of neuroticism.

Finally, in the analysis that included preference ratings for sadness, there was a marginal effect for online happiness, $F(1, 41) = 3.37, p < .08$, so that greater online happiness was related to higher preferences for sadness across situations ($\beta = .29$). Other effects were not significant ($F_s < 2.3$).³

Discussion

Although influenced by hedonic concerns, participants' preferences for affective experiences varied significantly on the basis of their level of neuroticism and the situation at hand. As predicted by the current framework, neuroticism was positively related to preferences for worry. Such preferences were not based on valence congruence per se, as neuroticism was unrelated to preferences for sadness. In addition, such preferences for worry were evident only in cognitively demanding situations (e.g., taking a test, giving a speech). Individuals high (vs. low) in neuroticism indicated preferences for higher levels of worry in cognitively demanding situations, despite the short-term negative hedonic consequences. These findings cannot be explained by purely short-term hedonic motives for affect regulation.

Although there is research on affect regulation that is not based on short-term hedonic concerns (e.g., Erber & Erber, 1994; Parrott & Sabini, 1990; Smith & Petty, 1995), most of it fails to provide direct evidence for motivated regulation. This has led to alternative interpretations of the findings that concern emotional reactivity, for example, rather than regulation (see Gross, 1999). By demonstrating that people have some direct access to preferences for unpleasant feelings in the short term, the results of Study 1 provide initial evidence for the existence of such preferences. Nevertheless, it is unclear whether people demonstrate such explicit preferences behaviorally. The remaining studies, therefore, use behavioral measures to examine motives for affect regulation.

Study 2

Study 2 was designed to replicate the results of Study 1, using a behavioral measure of affect regulation motives. Specifically, affect regulatory choices were examined after participants were told to expect an upcoming task. An important assumption of the current framework is that individuals engage in different affect

regulatory behaviors depending on the functionality of the affective state in a given context (Clore & Robinson, 2000; Martin, 2000). Therefore, I proposed that individuals high (vs. low) in neuroticism would be relatively more motivated to experience worry in a task that emphasizes performance outcomes but not in a task that emphasizes other outcomes (e.g., sociability, enjoyment, etc.).

To demonstrate that affect regulation depends on the nature of the situation at hand, I designed Study 2 so that participants were randomly assigned to expect either a cognitively demanding performance task (i.e., giving a speech) or an undemanding task (i.e., listening to music). I predicted that individuals high in neuroticism would show relatively higher preferences for worry (i.e., a trait-consistent state) when expecting a demanding (vs. undemanding) performance task. Giving a speech was chosen to serve as the cognitively demanding situation both because it entails obvious performance goals and because of all the situations included in Study 1, "giving a speech" involved the highest trait-consistent preferences, with neuroticism positively related to preferences for worry ($r = .37, p < .05$).

Several dependent measures of affect regulation have been used in previous research. For example, some authors have measured spontaneous effects on cognition (e.g., on memory, Parrott & Sabini, 1990; Smith & Petty, 1995; Tesser, Rosen, & Waranch, 1973), assuming that they reflect affect regulatory processes. However, spontaneous effects might reflect the outcomes of concurrent affect rather than regulatory processes and therefore cannot directly establish that affect regulation has taken place (Gross, 1999). An alternative measure of affect regulation involves having participants rate their preferences for certain anticipated activities that vary in hedonic consequences (e.g., Erber, Wegner, & Theraulot, 1996).

In Study 2, participants were asked to rate the degree to which they would like to recall different events that vary in their affective tone (happy vs. worried). Autobiographical recall was chosen to examine affect regulation motives because it has been demonstrated as an efficient affect regulation strategy that is used both intentionally (Josephson, Singer, & Salovey, 1996) and unintentionally (Erber & Erber, 1994; Parrott & Sabini, 1990; Setliff & Marmurek, 2002; Smith & Petty, 1995). I predicted that regardless of the content of the events to be recalled (e.g., concerning school or family), neuroticism would be related to higher preferences for recalling worrisome events when expecting to give a speech but not when expecting to listen to music.

Method

Participants

Participants were 227 undergraduate students (60% females; average age = 18.76 years) at the University of Illinois, who participated in return for partial credit toward an introductory psychology course requirement.

³ No significant effects were found for gender in Study 1. All the analyses reported in Studies 2–4 were initially conducted with gender as a predictor and found no significant effects for gender or Condition \times Gender interactions. Because effects for gender were not expected on a theoretical basis, nor were they found in the analyses, gender was excluded from the analyses reported in Studies 2–4.

Materials

Neuroticism and affect scales. Participants completed the same scales used in Study 1. In addition to measuring online happiness, online worry, and online sadness, to estimate feelings of online calmness, participants also rated the degree to which they felt *calm*, *relaxed*, and *pleased*.

Recall alternatives. Participants were asked to rate the degree to which they would like to recall happy and worrisome events from their past. Following Wegener and Petty (1994), these events also varied systematically in a quality other than their hedonic tone (i.e., content; e.g., “an event in which I was happy that concerned school,” “an event in which I was worried that concerned school”). The 2 (valence: happy and worried) \times 3 (content: friends, family, and school) design resulted in 6 different events that were presented in a single order that has been randomly determined (Wegener & Petty, 1994). Participants were asked to rate the degree to which they would like to recall each event on a 5-point scale (1 = *not at all*; 5 = *extremely*).

Procedure

After they were seated in private cubicles, participants were told that the study examines the relations between memory and task performance. They were told that prior to performing a task, they would be asked to recall an event from their past. Participants then rated their online feelings and completed a neuroticism scale, presumably so that the experimenter could control for differences among participants. Participants were then randomly assigned to expect either a cognitively demanding or an undemanding task. Participants who were assigned to expect a cognitively demanding task were told:

In this session, we will ask you to recall an event from your past. Then, you will need to prepare and give a short speech to the other participants in this session. The speech should last about 5 min, and we will tell you what it should be about. You will give the speech right after the recall task.

Participants who were assigned to expect an undemanding task were told:

In this session, we will ask you to recall an event from your past. Then, you will be asked to listen to music for a while. You will listen to the music right after the recall task.

At this point, participants were asked to rate the degree to which they would prefer to recall each of the listed events. Finally, to ensure that the situational manipulation was successful, the experimenter asked participants to what degree they expected the upcoming task (i.e., giving a speech or listening to music) to be effortful and cognitively demanding (1 = *not at all*; 5 = *extremely*). Participants were then debriefed and thanked for their participation.

Results

As predicted, there was a significant difference between the two conditions on ratings of expected effort, $F(1, 223) = 125.96, p < .001$, with participants who were assigned to expect a demanding task indicating that they expected the task to be moderately difficult ($M = 2.80, SD = 1.00$) and participants who were assigned to expect an undemanding task reporting that they expected the task not to be difficult at all ($M = 1.40, SD = 0.80$). This indicates that the situational manipulation was successful.

To estimate overall preferences for recalling worrisome and happy events prior to performing the effortful task, I first averaged across ratings of preferences for recalling worrisome events ($\alpha = .72$) and across ratings of preferences for recalling happy events

($\alpha = .72$), respectively. I predicted that neuroticism would be positively related to preferences for worrisome events in the demanding but not in the undemanding condition. To examine this hypothesis, I ran two simple regression analyses, one involving preferences for recalling worrisome events and another involving preferences for recalling happy events. The following terms were entered into a simple regression as simultaneous predictors: condition (1 = *demanding*, -1 = *undemanding*), neuroticism, online happiness, online worry, online calmness, online sadness, Condition \times Neuroticism, Condition \times Online Happiness, Condition \times Online Calmness, Condition \times Online Worry, and Condition \times Online Sadness. All continuous predictors (i.e., neuroticism and online feelings) were first centered.

With respect to preferences for recalling worrisome events, there was a significant effect of condition, $F(1, 226) = 9.10, p < .005$, with higher mean preferences for worry in the demanding condition ($M = 2.21$) versus the undemanding condition ($M = 1.87$). In addition, there were significant effects for neuroticism, $F(1, 226) = 8.07, p < .005$, and online worry, $F(1, 226) = 11.57, p < .005$, with preferences for worry positively related to neuroticism ($r = .16$) and to online worry ($r = .25$) across conditions. More important, as predicted, there was a Condition \times Neuroticism interaction, $F(1, 226) = 4.66, p < .05$. Specifically, when examining the effects of the predictors separately within the demanding and undemanding conditions, I found that neuroticism was significantly related to preferences for recalling worried events in the expected cognitively demanding condition ($\beta = .29, p < .01$) but not in the expected undemanding condition ($\beta = .01, p > .90$). Following Aiken and West (1991), in plotting the nature of the interaction, I used the coefficients in the overall regression equation to estimate mean preferences for recalling worrisome events among those lower ($-1 SD$) and higher ($+1 SD$) in neuroticism when expecting a demanding versus an undemanding task. These estimated means are presented in Figure 2.

With respect to preferences for recalling happy events, there was a significant effect for condition, $F(1, 226) = 18.77, p < .001$, with lower mean preferences for happiness in the demanding condition ($M = 3.76$) versus the undemanding condition ($M = 4.19$). In addition, there were significant effects for neuroticism, $F(1, 226) = 9.59, p < .005$, and for online happiness, $F(1, 226) = 8.76, p < .005$, with preferences for happy events positively related to online happiness ($r = .20$) and negatively related to neuroticism ($r = -.17$) across conditions. No other effects were

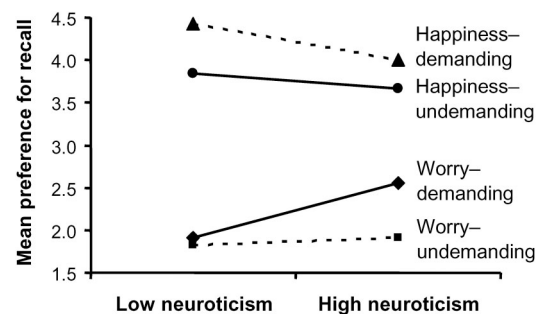


Figure 2. Preferences for recalling worrisome and happy events as a function of neuroticism and demanding versus undemanding conditions (Study 2).

significant. Figure 2 also plots the mean preferences for recalling happy events as a function of neuroticism and demanding versus undemanding conditions.

Finally, according to the present framework, personality traits and online affect should be associated with preferences for the valence but not for the content of preferred memories. To empirically examine this prediction, I repeated the above analyses using either preferences for school-, friends-, or family-related memories as the dependent variable. With respect to preferences for school-related memories, there were significant effects for online worry, $F(1, 226) = 10.25, p < .005$, and online sadness, $F(1, 226) = 8.40, p < .05$, with both positively related to such preferences ($r_s = .18$ and $.19$, respectively). With respect to preferences for memories concerning friends, there was a significant effect for online happiness, $F(1, 226) = 4.91, p < .05$, which was positively related to such preferences ($r = .13$). There was also a significant Condition \times Online Calmness interaction, $F(1, 226) = 3.99, p < .05$, indicating that calmness was positively related to preferences for memories concerning friends in the demanding condition ($r = .25$) but not in the undemanding condition ($r = -.01$). Finally, with respect to preferences for memories concerning family, there were significant effects for online happiness, $F(1, 226) = 5.17, p < .05$, and online calmness, $F(1, 226) = 4.13, p < .05$, with both positively related to such preferences ($r = .14$, and $.16$, respectively). More important, neuroticism was not significantly related to content preferences ($F_s < 2$).

Discussion

When asked to report on their general affective preferences in different situations in Study 1, participants high in neuroticism indicated higher preferences for worry than those low in neuroticism when considering cognitively demanding situations. The results of Study 2 demonstrate that when individuals high in neuroticism expected to engage in an upcoming cognitively demanding task, they indicated similar preferences for affect regulation. Specifically, neuroticism was positively related to preferences for recalling worrisome memories prior to giving a speech.

By demonstrating that preferences for worry are not evident in situations that lack clear performance goals (e.g., not cognitively demanding), the results of Study 2 provide further support for the proposed framework. As expected, preferences for worry were not evident among individuals high in neuroticism when they expected to be listening to music rather than giving a speech.

One alternative account of such affect regulation motives concerns affect-congruent effects. As individuals high in neuroticism often experience worry, preferences for worry might reflect affect-congruent preferences. Indeed, in Study 2, affect regulation preferences were influenced by both trait and state affect. However, whereas the relations between state affect and regulation preferences were consistent across conditions, the relations between trait affect and regulation preferences were context-specific. Online worry was related to higher preferences for recalling worrisome memories in both the cognitively demanding and undemanding conditions. In contrast, neuroticism was related to preferences for worry in the cognitively demanding condition but not in the undemanding condition. These results indicate that the obtained relations between neuroticism and preferences for worry cannot be explained as affect-congruent effects.

Study 3

In Study 2, motives for affect regulation were measured indirectly by asking participants to rate alternatives that varied in their hedonic tone. Such measures are more reliable than single-item measures, but they also have certain limitations. First, ratings of preferences for happy and worrisome memories are provided independently and are assumed to be orthogonal. Although there is reason to assume that positive and negative affect regulation are distinct (Wood, Hiempel, & Michela, 2003), in real life, people often need to choose between available hedonic options. Indeed, people rarely experience strong positive and negative emotions at any given moment (J. T. Larsen, McGraw, & Cacioppo, 2001; Scollon, Diener, Oishi, & Biswas-Diener, 2005). As a result, it is not clear to what extent continuous ratings of multiple hedonic options reflect affect regulation as it occurs in real life. Second, in Studies 1 and 2, participants indicated higher preferences for happy than worrisome experiences, regardless of their level of neuroticism. It is therefore impossible to conclude that individuals high in neuroticism might in fact choose to experience worry over happiness in cognitively demanding situations.

To overcome these limitations, in Studies 3 and 4, I measured affect regulation motives as active choices among alternatives that vary in their immediate hedonic implications (Erber et al., 1996; Heimpel, Wood, Marshall, & Brown, 2002; Wegener & Petty, 1994). Specifically, in Study 3, participants were asked to choose whether they would prefer to recall an event from their past in which they were happy, worried, sad, or calm prior to performing a demanding task. I predicted that consistent with previous predictions, individuals high (vs. low) in neuroticism would be more likely to pick worrisome events over the alternatives.

Method

Participants

Participants were 47 undergraduate students (70% females; average age = 18.70 years) at the University of Illinois, who participated in return for partial credit toward an introductory psychology course requirement.

Materials

Neuroticism and affect scales. The same scales were used as in the previous studies.

Procedure

The procedure was identical to the one used in Study 2, except for three changes. First, participants completed a neuroticism scale in a separate session 1 week prior to the experimental session. Second, Study 3 included only a cognitively demanding condition. Third, in the experimental session, instead of rating multiple recall alternatives that varied by valence and content, participants were asked to indicate whether they would rather recall a happy, calm, worried, or sad event from their past before giving a speech. Participants completed the study on a computer and were given the same instructions as in Study 2. However, whereas in Study 2 participants provided continuous ratings of different alternatives, in Study 3 participants were asked to complete the sentence "Before giving a speech, I would rather write about an event in which I felt _____," by picking either *happy*, *calm*, *worried*, or *sad* from a drop-down menu.

Results

Given the opportunity to pick which event to recall, 30 participants (64%) chose to recall an event in which they were happy, 10 participants (21%) chose to recall an event in which they were worried, 4 participants (9%) chose to recall an event in which they were calm, and 3 participants (6%) chose to recall an event in which they were sad. Table 1 presents the frequencies of choosing happy, calm, sad, and worried events at three levels of neuroticism (i.e., bottom, middle, and top thirds of the neuroticism distribution).

To examine the relationship between neuroticism, online feelings, and affect regulatory choice, I conducted a series of multinomial logistic regressions, with choice as a categorical response variable (happy, worried, sad, calm). Neuroticism, online happiness, online worry, online calmness, and online sadness were centered and entered as explanatory covariates. Multinomial logistic regressions examine the relationships between a categorical dependent variable and independent variables by combining multiple binary logistic regressions. In this framework, the effects of an independent variable are interpreted as the ability of that variable to distinguish between pairs of categories. For example, if worry is used as the reference category, the logistic regression computes the probabilities that a participant will choose to recall worrisome rather than happy memories, worrisome rather than sad memories, or worrisome rather than calm memories. In the present context, a different choice was entered as a reference category in each analysis to include all possible comparisons.

A chi-square test confirmed that the full model was a better fit to the data than a model containing no explanatory variables, $\chi^2(15, N = 47) = 25.35, p < .05$. In addition, neuroticism was the only explanatory variable that was significantly related to regulatory choice, $\chi^2(1, N = 47) = 13.05, p < .01$. Specifically, the higher participants were in neuroticism, the more likely they were to choose to recall events in which they were worried rather than happy, $\chi^2(1, N = 47) = 5.47, p < .05$, exponential (B) or $\text{Exp}(B) = 20.55$; sad, $\chi^2(1, N = 47) = 3.97, p < .05$, $\text{Exp}(B) = 54.03$; or calm, $\chi^2(1, N = 47) = 4.79, p < .05$, $\text{Exp}(B) = 52.95$. All other effects were nonsignificant (χ^2 s < 1.8).

Finally, the present analyses examined the effects of online feelings and neuroticism simultaneously. To examine whether online feelings influenced recall choices in Study 3, I repeated the analyses with each of the affect variables (i.e., online worry,

happiness, sadness, and calmness) as a single predictor. None of the effects were significant (χ^2 s < 1.8).

Discussion

One alternative interpretation of the previous results is that individuals high in neuroticism do not choose to experience worry per se but rather are more willing to tolerate some level of it compared with individuals low in neuroticism. The results of Study 3 rule out this possibility by showing that when expecting a demanding performance task, individuals high in neuroticism were more likely than those low in neuroticism to choose to recall an event from their past in which they were worried (vs. happy, sad, or calm).

Study 3 demonstrated that individuals high in neuroticism are more motivated compared with those low in neuroticism to experience worry in an effortful performance situation. It is important to note that such a goal can be obtained by either maintaining or changing an existing affective state. Individuals high in neuroticism who prefer to experience worry might choose to recall a worrisome event whether they are happy (i.e., thereby down-regulating their affect) or worried (i.e., thereby maintaining their affect). Because neuroticism did not interact with online feelings in predicting regulatory choice in Study 3, the current findings cannot be explained as an attempt to neutralize affect (Erber & Erber, 1994, 2000; Erber et al., 1996). Thus, it appears that individuals high (vs. low) in neuroticism are more likely to choose to experience worry in cognitively demanding situations.

The present framework is based on the assumption that trait-consistent affect might be adaptive when pursuing demanding performance goals. Although the results of Studies 1–3 demonstrate that individuals high (vs. low) in neuroticism indicate a relative preference for worry in performance-based, demanding situations, no direct evidence has yet been provided for the adaptive nature of such affect regulation motives. Study 4 was designed to replicate the previous findings as well as to provide initial evidence for the adaptive nature of the studied phenomena.

Study 4

To provide some insight into the possible outcomes of trait-consistent affect regulation, Study 4 examined affect regulatory choices as well as subsequent performance outcomes. As is common in the literature (e.g., Carver, Peterson, Follansbee, & Scheier, 1983; Norem & Cantor, 1986), to examine cognitive performance, I asked participants to solve a list of anagrams. In addition, by leading participants to expect a cognitive task other than giving a speech (i.e., completing an anagram task), Study 4 examined the generalizability of the findings from Studies 2–3.

Specifically, participants were told that they would perform a test but that they would first recall an event from their past. To control for possible effects of choice consistency per se (e.g., frustration for not getting to write about the event of their choice), I asked participants to choose both the valence of the event (happy vs. worried) and the content of the event (concerning school vs. not). Participants were then randomly assigned to write about an event of their chosen valence but not their chosen content, or about an event of their chosen content but not their chosen valence. As

Table 1
Frequencies of Recall Choices at Different Levels of Neuroticism (Study 3)

Recall choice	Level of neuroticism		
	Low	Medium	High
Happy	9	12	8
Calm	3	1	0
Sad	1	2	0
Worried	1	1	8

Note. Low, medium, and high levels of neuroticism reflect bottom, middle, and top thirds of the neuroticism distribution, respectively.

shown repeatedly in previous research (e.g., Gasper & Clore, 1998; Schwarz & Clore, 1983; Tamir et al., 2002), writing in detail about a past emotional event induces congruent feelings. Therefore, participants spent 10 min writing about the event and then completed the anagram task.

Method

Participants

Participants were 92 undergraduate students at the University of Illinois (55% female, mean age = 18.81 years), who participated in return for partial credit toward an introductory psychology course requirement.

Materials

Neuroticism and affect scales. Participants completed the same scales used in the previous studies.

Affect manipulation. Autobiographical memory was used to induce happiness and worry (see Schwarz & Clore, 1983; Tamir et al., 2002). Specifically, participants were told,

Please think about your life. Try to think about an event that made you feel really happy [worried] in the past few years. Please take time to imagine what this event was like that made you feel truly happy [worried] and try to relive it again in your mind's eye. Then describe what made you feel happy [worried] as vividly and in as much detail as you can.⁴

Anagram task. Five-letter, single-answer anagrams were chosen from Gilhooly and Hay (1977), Gilhooly and Johnson (1978), and Novick and Sherman (2003). On the basis of a pilot test in which participants ($N = 18$) were asked to solve as many of the initial list of anagrams as they could, 45 anagrams were chosen. Specifically, 15 of the anagrams were considered easy (solved by over 60% of the participants), 15 were considered moderately hard (solved by about 50% of the participants), and 15 were considered difficult (solved by 40% of the participants or less).

Procedure

Participants completed the study in groups of 4–5. They completed the study on the computer, seated in private cubicles. After giving informed consent, they were presented with the instructions on a computer screen. They were told that the study concerns the relation between memory and cognitive skills and were then asked to rate their online feelings so that the experimenter could presumably control for differences among participants. Participants were then told that they would recall an event from their past and then complete a task that would determine their level of intelligence and creativity. To encourage motivated performance, the experimenter told participants that after they completed the task, they would be retested orally by the experimenter on some of the items to ensure the reliability of their performance.

As in the previous studies, before completing the task, participants were asked to indicate their preferences for recalling certain events from their past. Specifically, they were asked to choose which event they would prefer to recall (happy vs. worried; related to school vs. unrelated to school). Participants were then randomly assigned to one of two conditions. Participants assigned to the choice-congruent condition were asked to write about an event that is congruent with their choice of valence but not with their choice of content. On the other hand, participants assigned to the choice-incongruent condition were asked to write about an event that is incongruent with their choice of valence but congruent with their choice of content. Participants in both conditions wrote about their recalled event for 10 min.

At this point, participants were shown the list of 45 anagrams and were asked to solve as many anagrams as they could in 5 min. After the 5 min were up, participants were asked to indicate how difficult they found the task to be on a 7-point scale (1 = *extremely difficult*; 7 = *extremely easy*). Finally, participants were asked in a free-response format to describe what influenced their performance on the task and how they currently felt about the event they recalled (“How do you feel today about the event you recalled?”).

Participants returned to the lab 1 week following the experimental session and completed the neuroticism scale. They were then fully debriefed.

Results

Affect Regulatory Choice

Overall, 85% of the participants preferred to recall an event in which they were happy and 15% preferred to recall an event in which they were worried prior to completing a cognitively demanding task. Table 2 presents the frequencies of choosing happy and worried events at three levels of neuroticism (i.e., bottom, middle, and top thirds of the neuroticism distribution).

To directly examine the relations between choice of recall, neuroticism, and online feelings, I entered choice of recall (1 = *happy*; 0 = *worried*) as the outcome variable in a binary logistic regression, with centered neuroticism, online happiness, online worry, online calmness, and online sadness as the predictors. The analysis yielded a significant effect for neuroticism. Participants high (vs. low) in neuroticism were more likely to prefer recalling a worried event, $\chi^2(1, N = 92) = 4.14, p < .05, \text{Exp}(B) = .35$. None of the other effects approached significance ($\chi^2s < 1.3$). The above analysis was repeated using choice of content (1 = *school related*; 0 = *not school related*) as the dependent variable. None of the effects were significant ($F < 2$). Choice of valence and choice of content were also not significantly related to one another ($r = -.12, p > .2$).

The Recalled Events

Fifty-five percent of the participants were assigned to recall an event from their past in which they were worried, and 45% were assigned to recall an event from their past in which they were happy. The distribution of neuroticism was identical across conditions, as found in a comparison of box plots and q-q plots of neuroticism across recall conditions, as well as in a one-way analysis of variance predicting levels of neuroticism from valence of recall ($F_s < 1.1$).

To examine the effects of recall on subsequent feelings, the experimenter asked participants, at the end of the study, to describe

⁴ The effectiveness of the affect manipulation was examined in a separate pilot study. After rating their online feelings, participants ($N = 120$) were randomly assigned to write about either a happy or a worried event from their past for 10 min and then rate their current feelings. Subsequent analyses confirmed that following the worry induction reports of happiness and calmness significantly decreased ($ds = -.58$ and $-.45$, respectively) whereas reports of worry and sadness significantly increased ($ds = .30$ and $.17$, respectively). On the other hand, following the happiness induction, reports of happiness significantly increased ($d = .46$), reports of calmness remained unchanged ($d = -.03$), and reports of worry and sadness significantly decreased ($ds = -.17$ and $-.18$, respectively).

how they currently felt about the event they recalled.⁵ These responses were coded for current feelings that are congruent versus incongruent with feelings experienced when the event took place. Seventy percent of the responses suggested that recalling the event made participants feel as they did when the event took place (e.g., “I still feel pretty bad and worried”). Whether people felt the same way or differently toward the event did not differ as a function of the valence of the event they recalled, as indicated in a binary logistic regression with retrospective feelings (1 = *same*; 0 = *different*) as the predicted variable and valence of recall (1 = *happy*; -1 = *worried*) as the categorical predictor (χ^2 s < 2).

Performance on the Anagram Task

As expected, most participants rated the anagram task as somewhat difficult ($M = 3.40$, $SD = 1.40$), supporting the demanding nature of the task. The current framework predicts that individuals high in neuroticism would perform better on the anagram task after recalling an event from their past in which they were worried. To examine this prediction, I entered the total score on the anagram task as the dependent variable in a linear regression analysis, with choice (1 = *congruent*; -1 = *incongruent*), weighted effect-coded recall (1 = *happy*; -.80 = *worried*), centered neuroticism, Neuroticism \times Choice, and Neuroticism \times Recall as simultaneous predictors.⁶

The analysis yielded a marginal effect for recall type, $F(1, 88) = 3.40$, $p < .08$, indicating that performance tended to be better following the recall of worrisome events. However, more important, this marginal effect was qualified by a significant Recall \times Neuroticism interaction, $F(1, 88) = 3.80$, $p = .05$. Simple slope analyses indicated that recalling a worrisome versus happy event was related to anagram performance among individuals high in neuroticism ($\beta = -.42$, $p < .05$) but not among those low in neuroticism ($\beta = .14$, $p > .50$). As in previous analyses, the overall regression equation was used to plot the nature of the interaction. Specifically, as shown in Figure 3, participants higher in neuroticism (+1 SD) solved more anagrams after recalling a worried (vs. happy) event from their past. On the other hand, the performance of participants lower in neuroticism (-1 SD) was not particularly influenced by the type of event recalled prior to completing the task. To examine whether the content of the recalled event influenced anagram performance, I repeated the above analysis with the content of the event (i.e., concerning school vs. not) as the dependent variable. None of the effects were significant (F s < 1).⁷

Table 2
Frequencies of Recall Choices at Different Levels of Neuroticism (Study 4)

Recall choice	Level of neuroticism		
	Low	Medium	High
Happy	30	31	18
Worried	2	4	7

Note. Low, medium, and high levels of neuroticism reflect bottom, middle, and top thirds of the neuroticism distribution, respectively.

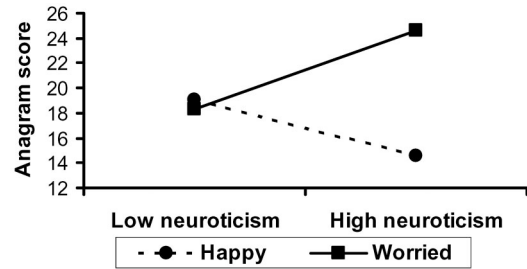


Figure 3. Anagram performance as a function of neuroticism and the type of event participants recalled prior to completing the task (Study 4).

Finally, after they completed the anagram task, participants were asked to indicate, in a free-response format, what influenced their performance on the task. Of all the participants, only one person provided a reason related to feelings (i.e., “moodiness”) as influencing her performance. Of the remaining responses, 44% mentioned task-related issues (e.g., “the time limit,” “the amount of vowels and the combinations of certain letters”); 35% referred to their skills and abilities (e.g., “I am just not really good at doing anagrams”); and the remaining 21% mentioned personal concerns, including being tired, having trouble concentrating, or wanting to do well. These responses suggest that participants were largely unaware of the effect their feelings had on their performance.

Discussion

Replicating the findings in the previous studies, when faced with an upcoming demanding task in Study 4, participants high (vs. low) in neuroticism were more likely to choose to engage in a task that is likely to induce worry (i.e., recall an event from their past in which they were worried). There is also some indication that after they completed the recall task, participants tended to feel as

⁵ To ensure that participants wrote about events in which they were worried or happy as instructed, three independent judges coded the content of the recalled events for valence (*happy*, *worried*, or *other*) and for use of emotionally congruent terms. All participants wrote about the event that they were instructed to write about. Furthermore, in 90% of the cases, the description of the event included explicit congruent emotion terms (with respect to the remaining cases, 5% included both congruent as well as incongruent terms and 5% did not include explicit emotion terms).

⁶ Weighted effects coding is a variation on effect codes designed for cases in which groups have unequal sizes. In Study 4, 41 participants were assigned to recall a happy event and 51 participants were assigned to recall a worrisome event. Therefore, the negative weight for the worry condition was altered to -.80, so that all cases sum to zero.

⁷ To examine whether anagram difficulty moderated the present effects, I ran a repeated measures analysis using general linear modeling. In this analysis, total number of easy, moderate, and difficult anagrams solved by each participant served as a three-level within-person dependent variable. Choice (congruent vs. incongruent) and recall (happy vs. worried) were entered as between-subjects factors, with neuroticism as a covariate. In the analysis, there was a significant effect for task difficulty, $F(2, 176) = 13.38$, $p < .01$, indicating that performance was best on the easy anagrams and worst on the difficult anagrams (67%, 49%, and 30% of easy, moderate, and difficult anagrams solved, respectively). No other interaction with task difficulty was significant (F s < 1.5).

they did when the event took place. In addition, as in the previous studies, online feelings did not account for the affect regulatory choice, providing further evidence that such preferences cannot be attributed to affect-congruent effects.

Study 4 provides some evidence for the assumption that people regulate their affect to enhance their performance in a given situation (Gohm, 2003). Specifically, individuals high in neuroticism performed better on the anagram task after writing in length about an event from their past in which they were worried (vs. happy), thereby increasing their level of worry prior to task completion. This raises the possibility that for individuals high in neuroticism, feeling good may not always translate into doing well.

General Discussion

In a recent review on emotional self-regulation, Bonanno (2001) highlighted two theoretical issues that demand researchers' attention: Pleasure-incongruent regulation (i.e., increasing negative feelings or decreasing positive feelings) and the adaptive or maladaptive nature of regulatory strategies. The present research addresses both these issues empirically by describing a case of affect regulation that involves the increase of unpleasant feelings and examining its adaptive nature.

The present research demonstrates that individuals high (vs. low) in neuroticism are more likely to choose to experience worry in cognitively demanding situations, to improve performance. Individuals high (vs. low) in neuroticism preferred to experience worry despite its short-term hedonic costs, to increase the likelihood of future positive outcomes. This was evident both when participants explicitly reported on their affective preferences in a self-report survey (Study 1) and when motives for affect regulation were examined behaviorally in an experimental setting (Studies 2–4). In addition, such motives were evident in situations that involve demanding cognitive performance but not in a situation that involves an undemanding task (Study 2). Study 4 provides some evidence for the adaptive benefits of such affect regulation motives for performance. Finally, by simultaneously measuring online feelings (Studies 1–4), the present findings were able to rule out affect-congruent effects as an alternative explanation.

Pleasure and Affect Regulation

“A human being is not one in pursuit of happiness, but rather in search of a reason to be happy” (Frankl, 1984, pp. 162). Although some psychologists have tried to theoretically account for motives to increase unpleasant feelings or to decrease pleasant feelings (e.g., Parrott, 1993, 2002), empirical research demonstrating such motives and their effects on behavior is extremely sparse. The present research provides direct support for the existence of motives for increasing unpleasant feelings in the short term.

There is some empirical evidence for cases of affect regulation that do not involve the increase of pleasant feelings. However, the present findings extend such research in two important ways. First, most of the existing research is more consistent with motivation to neutralize affect than to experience negative feelings per se. For example, Erber et al. (1996) found that participants who expected to interact with a stranger (vs. not) preferred to engage in an affect-incongruent task prior to the interaction. In contrast, in the

current studies participants high (vs. low) in neuroticism chose to engage in worrisome tasks, whether their online affect was positive or negative in valence.

Second, existing evidence for pleasure-incongruent affect regulation ties it to potential maladaptive consequences. For example, Wood et al. (2003) found that participants low (vs. high) in self-esteem were more likely to down-regulate positive feelings. Such participants were also less likely to intentionally engage in an activity that could increase positive feelings, following a negative affect induction (Heimpel et al., 2002). In both cases, the authors suggested that such affect regulation tendencies serve to maintain negative views of self-worth. In contrast, the present research presents a case of pleasure-incongruent affect regulation that is potentially adaptive in nature.

Implications for Affect and Performance

The present research raises the possibility that, at least in the case of neuroticism, trait-consistent negative states (i.e., worry) can benefit performance in cognitively effortful situations. This is presumably because worry reflects an active avoidance system (Borkovec, Alcaine, & Behar, 2004) and because individuals high in neuroticism are motivated primarily by the avoidance system (Carver et al., 2000; Gray, 1981). Given that a match between trait and state motivational cues leads to increased effort and task engagement (Higgins, 2000), one should expect trait-consistent affect to enhance performance particularly in effortful situations.

Indeed, in Study 4, worry-inducing affect regulation improved the performance of individuals who were high (vs. low) in neuroticism. Although demanding further replication, this finding has interesting implications for the study of affect and performance. First, the findings are consistent with views of affective states as having both informational (e.g., leading to affect-congruent responses) and directive (e.g., increasing task engagement) effects on performance (see Gendolla, 2000). Second, it suggests that the influence of affect on performance can vary as a function of individual differences (see also Mikulincer & Sheeli, 2000; Sanna, 1998). Whereas worry enhanced the performance of individuals high in neuroticism, it did not do so for those low in neuroticism.

Important Caveats and Some Future Directions

The current findings demonstrate that in certain cases, individuals high (vs. low) in neuroticism may be motivated to forgo momentary pleasure in the short term for the sake of other instrumental benefits. However, it is important to emphasize that such findings do not undermine the hedonic principle in the long term. First, when allowing participants to indicate preferences for both happy and worrisome experiences, I found that preferences for pleasant experiences were higher than for unpleasant experiences, even for individuals high in neuroticism. Second, when choosing to engage in a task that should induce worry, such affect regulation is likely targeted at relatively low to moderate (vs. high) levels of worry. Finally, when individuals high in neuroticism prefer to experience worry, they are likely do so to increase the chances of subsequent success, which, in turn, should result in pleasant emotional experiences. The present findings, therefore, do not suggest that people wish to ultimately be unhappy, rather that preferences for affective experiences can also be influenced by pragmatic

considerations that may sometimes lead to unpleasant outcomes in the short term (for a related argument, see Parrott, 2002).

Although Study 4 provided preliminary evidence that some degree of worry is beneficial for individuals high in neuroticism in effortful performance situations, such findings should be interpreted with caution. In particular, it has been demonstrated repeatedly that high levels of negative affect can be detrimental to performance and that such effects are especially likely to influence trait-anxious individuals or those high in neuroticism (for a review, see Williams, Watts, MacLeod, & Mathews, 1997). By demonstrating that lower levels of worry may benefit individuals high in neuroticism in certain cases, the current findings emphasize the importance of further exploring interactive effects of neuroticism and negative affect on performance, as well as the variables that might determine the nature of such interactions (e.g., intensity and frequency of emotional experiences).

The present studies focused on worry, which is a negatively affect-laden chain of thoughts and images (Borkovec, Robinson, Pruzinsky, & DePree, 1983). Focusing on worry was desirable in the present framework, given that it is intimately tied to avoidance motivation (Borkovec et al., 2004), as is neuroticism. However, future research should examine whether the present findings generalize to other avoidance-related negative states (e.g., fear or anxiety) that are less cognitive in nature. In addition, support for a general pattern of trait-consistent affect regulation would require examining other affective traits. For example, future research should examine whether extraverts (vs. introverts) show greater preferences for trait-consistent affect (i.e., happiness or excitement), in cognitively effortful situations.

Finally, although Study 4 provides preliminary evidence for the beneficial effects of worry on performance in the case of neuroticism, the links between traits, online feelings, and performance are complex (see Matthews & Gilliland, 1999). Such links may depend on the goal and strategy of affect regulation, on the timing of the regulatory attempts, and on the nature of the task at hand. Exploring such factors systematically would allow for a better understanding of the adaptive nature of affect regulation, as well as the interplay between trait and state affect and performance.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Aspinwall, L. (1998). Rethinking the role of positive affect in self-regulation. *Motivation and Emotion, 22*, 1–32.
- Bonanno, G. A. (2001). Emotion self-regulation. In T. J. Mayne & G. A. Bonanno (Eds.), *Emotions: Current issues and future directions* (pp. 251–285). New York: Guilford Press.
- Borkovec, T. D., Alcaine, O., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. In R. G. Heimberg, C. L. Turk, & D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 77–108). New York: Guilford Press.
- Borkovec, T. D., Robinson, E., Pruzinsky, T., & DePree, J. A. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behavior Research and Therapy, 21*, 9–16.
- Camacho, C. J., Higgins, E. T., & Luger, L. (2003). Moral value transfer from regulatory fit: What feels right is right and what feels wrong is wrong. *Journal of Personality and Social Psychology, 84*, 498–510.
- Carver, C. S. (2004). Negative affects deriving from the behavioral approach system. *Emotion, 4*, 3–22.
- Carver, C. S., Peterson, L. M., Follansbee, D. J., & Scheier, M. F. (1983). Effects of self-directed attention on performance and persistence among persons high and low in test anxiety. *Cognitive Therapy and Research, 7*, 333–353.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.
- Carver, C. S., Sutton, S. K., & Scheier, M. F. (2000). Action, emotion, and personality: Emerging conceptual integration. *Personality and Social Psychology Bulletin, 26*, 741–751.
- Clore, G. L., & Robinson, M. D. (2000). What is emotion regulation? In search of a phenomenon. *Psychological Inquiry, 11*, 163–166.
- Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology, 38*, 668–678.
- Cunningham, M. R. (1998). What do you do when you're happy or blue? Mood, expectancies, and behavioral interest. *Motivation and Emotion, 12*, 309–331.
- Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences, 22*, 491–517.
- Elliot, A. J., & Thrash, T. M. (2002). Approach–avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality and Social Psychology, 82*, 804–818.
- Erber, R., & Erber, M. W. (1994). Beyond mood and social judgment: Mood incongruent recall and mood regulation. *European Journal of Social Psychology, 24*, 79–88.
- Erber, R., & Erber, M. W. (2000). The self-regulation of moods: Second thoughts on the importance of happiness in everyday life. *Psychological Inquiry, 11*, 142–148.
- Erber, R., Wegner, D. M., & Theriault, N. (1996). On being cool and collected: Mood regulation in anticipation of social interaction. *Journal of Personality and Social Psychology, 70*, 757–766.
- Fischer, A. H., Manstead, A. S. R., Evers, C., Timmers, M., & Valk, G. (2004). Motives and norms underlying emotion regulation. In P. Philippot & R. S. Feldman (Eds.), *The regulation of emotion* (pp. 187–210). Mahwah, NJ: Erlbaum.
- Forgas, J. P., Ciarrochi, J., & Moylan, S. (2000). Subjective experience and mood regulation: The role of information-processing strategies. In H. Bless & J. P. Forgas (Eds.), *The message within: The role of subjective experience in social cognition and behavior* (pp. 179–202). Philadelphia: Psychology Press.
- Frankl, V. (1984). *Man's search for meaning: Revised and updated*. New York: Washington Square Press.
- Frijda, N. H. (1999). Emotions and hedonic experience. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 190–210). New York: Russell Sage Foundation.
- Gaspar, K., & Clore, G. L. (1998). The persistent use of negative affect by anxious individuals to estimate risk. *Journal of Personality and Social Psychology, 74*, 1350–1363.
- Gendolla, G. H. E. (2000). On the impact of mood on behavior: An integrative theory and a review. *Review of General Psychology, 4*, 378–408.
- Gilhooly, K. J., & Hay, D. (1977). Imagery, concreteness, age-of-acquisition, familiarity, and meaningfulness values of 205 five-letter words having single-solution anagrams. *Behavior Research Methods and Instrumentation, 9*, 12–17.
- Gilhooly, K. J., & Johnson, C. E. (1978). Effects of solution word attributed on anagram difficulty: A regression analysis. *Quarterly Journal of Experimental Psychology: Human Experimental Psychology, 30(A)*, 57–70.
- Gohm, C. (2003). Mood regulation and emotional intelligence: Individual

- differences. *Journal of Personality and Social Psychology*, 84, 594–607.
- Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 7–28). Tilburg, The Netherlands: Tilburg University Press.
- Gray, J. A. (1981). A critique of Eysenck's theory of personality. In H. J. Eysenck (Ed.), *A model for personality* (pp. 246–276). Berlin, Germany: Springer-Verlag.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2, 271–299.
- Gross, J. J. (1999). Emotion regulation: Past, present, future. *Cognition & Emotion*, 13, 551–573.
- Harmon-Jones, E. (2003). Anger and the behavioral approach system. *Personality and Individual Differences*, 35, 995–1005.
- Harmon-Jones, E., & Allen, J. J. B. (1998). Anger and prefrontal brain activity: EEG asymmetry consistent with approach motivation despite negative affective valence. *Journal of Personality and Social Psychology*, 74, 1310–1316.
- Heimpel, S. A., Wood, J. V., Marshall, M. A., & Brown, J. D. (2002). Do people with low self-esteem really want to feel better? Self-esteem differences in motivation to repair negative moods. *Journal of Personality and Social Psychology*, 82, 128–147.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319–340.
- Higgins, E. T. (2000). Making a good decision: Value from fit. *American Psychologist*, 55, 1217–1230.
- Hirt, E. R., & McCrea, S. M. (2000). Beyond hedonism: Broadening the scope of affect regulation. *Psychological Inquiry*, 11, 180–183.
- Isen, A. M. (2000). Some perspectives on positive affect and self-regulation. *Psychological Inquiry*, 11, 184–187.
- Josephson, B. R., Singer, J. A., & Salovey, P. (1996). Mood regulation and memory: Repairing sad moods with happy memories. *Cognition & Emotion*, 10, 437–444.
- Krohne, H. W., Pieper, M., Knoll, N., & Breimer, N. (2002). The cognitive regulation of emotions: The role of success versus failure experience and coping dispositions. *Cognition & Emotion*, 16, 217–243.
- Larsen, J. T., McGraw, A. P., & Cacioppo, J. T. (2001). Can people feel happy and sad at the same time? *Journal of Personality and Social Psychology*, 81, 684–696.
- Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological Inquiry*, 11, 129–141.
- Larsen, R. J., & Diener, E. (1992). Promises and problems with the circumplex model of emotion. In M. S. Clark (Ed.), *Emotion* (pp. 25–59). Thousand Oaks, CA: Sage.
- Lucas, R. E., & Fujita, F. (2000). Factors influencing the relations between extraversion and pleasant affect. *Journal of Personality and Social Psychology*, 79, 1039–1056.
- Martin, L. L. (2000). Wag the dog: Do individuals regulate moods or do moods regulate individuals? *Psychological Inquiry*, 11, 192–196.
- Martin, L. L., & Davies, B. (1998). Beyond hedonism and associationism: A configural view of the role of affect in evaluation, processing, and self-regulation. *Motivation and Emotion*, 22, 33–51.
- Matthews, G., & Gilliland, K. (1999). The personality theories of H. J. Eysenck and J. A. Gray: A comparative view. *Personality and Individual Differences*, 26, 583–626.
- Mikulincer, M., & Sheeli, E. (2000). Adult attachment style and cognitive reactions to positive affect: A test of mental categorization and creative problem solving. *Motivation and Emotion*, 24, 149–174.
- Norem, J. K., & Cantor, C. (1986). Defensive pessimism: Harnessing anxiety as motivation. *Journal of Personality and Social Psychology*, 51, 1208–1217.
- Novick, L. R., & Sherman, S. J. (2003). On the nature of insight solutions: Evidence from skill differences in anagram solution. *Quarterly Journal of Experimental Psychology: Human Experimental Psychology*, 56(A), 351–382.
- Parkinson, B., Totterdell, P., Briner, R. B., & Reynolds, S. (1996). *Changing moods: The psychology of mood and mood regulation*. London: Longman.
- Parrott, W. G. (1993). Beyond hedonism: Motives for inhibiting good moods and for maintaining bad moods. In D. M. Wegner & J. W. Pennebaker (Eds.), *Handbook of mental control* (pp. 278–305). New Jersey: Prentice Hall.
- Parrott, W. G. (2002). The functional utility of negative emotions. In L. Feldman Barrett & P. Salovey (Eds.), *The wisdom in feeling: Psychological processes in emotional intelligence* (pp. 341–359). New York: Guilford Press.
- Parrott, W. G., & Sabini, J. (1990). Mood and memory under natural conditions: Evidence for mood incongruent recall. *Journal of Personality and Social Psychology*, 59, 321–336.
- Sanna, L. J. (1998). Defensive pessimism and optimism: The bitter-sweet influence of mood on performance and prefactual and counterfactual thinking. *Cognition & Emotion*, 12, 635–665.
- Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgment of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, 45, 513–523.
- Scollon, C. N., Diener, E., Oishi, S., & Biswas-Diener, R. (2005). An experience sampling and cross-cultural investigation of the relation between pleasant and unpleasant affect. *Cognition & Emotion*, 19, 27–52.
- Setliff, A. E., & Marmurek, H. H. C. (2002). The mood regulatory function of autobiographical recall is moderated by self-esteem. *Personality and Individual Differences*, 32, 761–771.
- Shah, E. R., Higgins, E. T., & Friedman, R. (1998). Performance incentives and means: How regulatory focus influences goal attainment. *Journal of Personality and Social Psychology*, 74, 285–293.
- Smith, S. M., & Petty, R. E. (1995). Personality moderators of mood congruency effects on cognition: The role of self-esteem and negative mood regulation. *Journal of Personality and Social Psychology*, 68, 1092–1107.
- Tamir, M., & Robinson, M. D. (2004). Knowing good from bad: The paradox of neuroticism, negative mood, and evaluative processing. *Journal of Personality and Social Psychology*, 87, 913–925.
- Tamir, M., Robinson, M. D., & Clore, G. L. (2002). The epistemic benefits of trait-consistent mood states: An analysis of extraversion and mood. *Journal of Personality and Social Psychology*, 83, 663–677.
- Tellegen, A. (1985). Structure 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: Erlbaum.
- Tesser, A., Rosen, S., & Waranch, E. (1973). Communicator mood and the reluctance to transmit undesirable messages (the mum effect). *The Journal of Communications*, 23, 266–283.
- Thayer, R. E. (1996). *The origin of everyday moods: Managing energy, tension, and stress*. London: Oxford University Press.
- Thayer, R. E. (2000). Mood regulation and general arousal systems. *Psychological Inquiry*, 11, 202–204.
- Tice, D. M., Baumeister, R. F., & Zhang, L. (2004). The role of emotion in self-regulation: Differing roles of positive and negative emotions. In P. Philippot & R. S. Feldman (Eds.), *The regulation of emotion* (pp. 213–226). Mahwah, NJ: Erlbaum.
- Tice, D. M., & Bratslavsky, E. (2000). Giving in to feel good: The place of emotion regulation in the context of general self-control. *Psychological Inquiry*, 11, 149–159.

- Watson, D. (2000). *Mood and temperament*. New York: Guilford Press.
- Watson, D., Wiese, D., Vaidya, J., & Tellegen, A. (1999). The two general activation systems of affect: Structural findings, evolutionary considerations, and psychobiological evidence. *Journal of Personality and Social Psychology*, 76, 820–838.
- Wegener, D. T., & Petty, R. E. (1994). Mood management across affective states: The hedonic contingency hypothesis. *Journal of Personality and Social Psychology*, 66, 1034–1048.
- Williams, J. M. G., Watts, F. N., MacLeod, C., & Mathews, A. (1997). *Cognitive psychology and emotional disorder* (2nd ed.). Chichester, England: Wiley.
- Wood, J. V., Heimpel, S. A., & Michela, J. L. (2003). Savoring versus dampening: Self-esteem differences in regulating positive affect. *Journal of Personality and Social Psychology*, 85, 566–580.

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New Editors Appointed, 2007–2012

The Publications and Communications (P&C) Board of the American Psychological Association announces the appointment of three new editors for 6-year terms beginning in 2007. As of January 1, 2006, manuscripts should be directed as follows:

- *Journal of Experimental Psychology: Learning, Memory, and Cognition* (www.apa.org/journals/xlm.html), **Randi C. Martin, PhD**, Department of Psychology, MS-25, Rice University, P.O. Box 1892, Houston, TX 77251.
- *Professional Psychology: Research and Practice* (www.apa.org/journals/pro.html), **Michael C. Roberts, PhD**, 2009 Dole Human Development Center, Clinical Child Psychology Program, Department of Applied Behavioral Science, Department of Psychology, 1000 Sunnyside Avenue, The University of Kansas, Lawrence, KS 66045.
- *Psychology, Public Policy, and Law* (www.apa.org/journals/law.html), **Steven Penrod, PhD**, John Jay College of Criminal Justice, 445 West 59th Street N2131, New York, NY 10019-1199.

Electronic manuscript submission. As of January 1, 2006, manuscripts should be submitted electronically through the journal's Manuscript Submission Portal (see the Web site listed above with each journal title).

Manuscript submission patterns make the precise date of completion of the 2006 volumes uncertain. Current editors, Michael E. J. Masson, PhD, Mary Beth Kenkel, PhD, and Jane Goodman-Delahunty, PhD, JD, respectively, will receive and consider manuscripts through December 31, 2005. Should 2006 volumes be completed before that date, manuscripts will be redirected to the new editors for consideration in 2007 volumes.

In addition, the P&C Board announces the appointment of **Thomas E. Joiner, PhD** (Department of Psychology, Florida State University, One University Way, Tallahassee, FL 32306-1270), as editor of the *Clinician's Research Digest* newsletter for 2007–2012.