

Emotional Distress Regulation Takes Precedence Over Impulse Control: If You Feel Bad, Do It!

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Why do people's impulse controls break down during emotional distress? Some theories propose that distress impairs one's motivation or one's ability to exert self-control, and some postulate self-destructive intentions arising from the moods. Contrary to those theories, Three experiments found that believing that one's bad mood was frozen (unchangeable) eliminated the tendency to eat fattening snacks (Experiment 1), seek immediate gratification (Experiment 2), and engage in frivolous procrastination (Experiment 3). The implication is that when people are upset, they indulge immediate impulses to make themselves feel better, which amounts to giving short-term affect regulation priority over other self-regulatory goals.

I count him braver who overcomes his desires than him who conquers his enemies, for the hardest victory is the victory over self.

—Aristotle

Everything that feels good is either illegal, immoral, or fattening.

—Unknown

The ability to control and regulate impulses, emotions, desires, performances, and other behaviors is one of the core features of the self. Given the adaptive benefits of being able to manage inner states and alter one's own behavioral responses, self-regulation is also vitally important for achieving success and happiness in life. Deficiencies and failures in impulse control have been linked to a broad spectrum of personal and social problems, including addiction and substance abuse, crime, domestic violence, teen pregnancy, school failure, debt and bankruptcy, sexually transmitted diseases, smoking, and obesity (see Baumeister, Heatherton, & Tice, 1994, for a review).

Some self-regulation failures may occur because different regulatory goals are in conflict. The present investigation was concerned with one particular type of conflict, namely, between affect regulation and impulse control. In general, impulse control requires the person to stifle the quest for short-term, often pleasurable rewards so as to pursue distal goals. To achieve the optimal long-term outcomes, people must avoid responding only to the immediate stimulus environment so that they can pursue long-term strategies that produce significant (but delayed) benefits. In fact, one might plausibly speculate that the reason the human capacity

for self-regulation evolved was to enable human beings to resist immediate impulses and pursue long-term goals.

Impulse control and optimal self-regulation may thus require a long-range focus on distal goals. Emotional distress, however, may shift priorities toward the immediate present. When people feel acutely bad, they generally wish to feel better, and this wish is often urgent. The promise of feeling better in 1 or 2 years is probably too remote to console most people who are acutely upset here and now. Emotional distress may therefore work against the usual pattern of impulse control because distress promotes a short-term focus, whereas impulse control requires a long-term one.

The conflict is further exacerbated by the promise of immediate pleasure that many impulsive behaviors may carry. Indeed, successful self-regulation in the service of long-term goals often depends on foregoing immediate pleasures. Meanwhile, a present-oriented desire to escape from emotional distress probably enhances the search for immediate sources of good feelings. Many of the common foci of self-regulatory restraints are activities that hold some promise of immediate pleasure: alcohol, drugs, high-calorie foods, illicit sex, extra sleep, expensive purchases, time-wasting games, and other entertainments.

Thus, there is a special antipathy between affect regulation and other spheres of self-control. When under emotional distress, people may give priority to the short-term goal of feeling better and in the process may sacrifice long-range goals such as slimness, sobriety, and thrift. The tendency to give priority to affect regulation is therefore detrimental to behavioral self-control and can be costly in the long run. In other words, affect regulation may win out over impulse control when people are emotionally upset.

Thus, the central idea of this investigation was that impulse control may fail because emotionally distraught people give primacy to affect regulation. To test this idea, we adapted the mood-freezing procedure developed by Manucia, Baumann, and Cialdini (1984), which looks for behavioral change as a function of whether affect regulation is ostensibly possible or impossible. Behaviors that are found only when affect regulation is possible are inferred to be motivated (at least in part) by the desire for affective benefit. In Study 2, we also considered individual differences in mood regulation proclivities by using the scale developed by Catanzaro and Mearns (1990, 1999). In Study 3, we varied the affective

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appeal of distractor tasks that would compete with the main assigned task. To increase the generality of our results for the broad range of impulse control processes, we examined impulse control in the different spheres of eating (Study 1), delay of gratification (Study 2; Knapp & Clark, 1991), and procrastination (Study 3).

Emotional Distress and Regulatory Failure

Ample evidence has indicated that self-regulation (especially impulse control) tends to deteriorate during periods of emotional distress. Here, we briefly review some of the major evidence to substantiate the effects of emotion on self-control across multiple spheres of control.

Eating is one important sphere in which bad moods lead to regulatory failure. Overweight people are more likely to report excessive eating when they are anxious or depressed (Logue, 1993). Inducing a bad mood in dieters has been shown to lead to increases in eating (Greeno & Wing, 1994). Likewise, induced anxiety causes obese people to increase their consumption of food (Slochower & Kaplan, 1980). In many cases, a reciprocal pattern of escalating or spiraling effects develops, in which distress causes eating, which leads to more distress as the person reflects on his or her dietary breakdown, which in turn triggers more eating (Heatherton & Polivy, 1992). The existence of multiple links or mechanisms that connect distress to eating is suggested by different patterns, such as the fact that ego threats and physical dangers affect dieters differently, but in general, restrained eating tends to be undermined by aversive emotional states (Heatherton, Herman, & Polivy, 1991; Heatherton, Striye, & Wittenberg, 1998).

Likewise, emotional distress causes people to fail in their efforts at smoking cessation (Brownell, Marlatt, Lichtenstein, & Wilson, 1986), and in general, smoking increases when people are distressed or upset (Ashton & Stepney, 1982). Laboratory inductions of anxiety lead to an increase in smoking (Schachter et al., 1977). During stressful situations, smokers feel better if they smoke (Gilbert & Spielberger, 1987; Nesbitt, 1973).

Distress also contributes to drinking. Alcohol is widely believed (by the general public) to reduce anxiety and improve mood (Sayette, 1993; Stockwell, 1985). These beliefs have some justification with moderate doses, but heavy doses actually contribute to more negative moods (Nathan, Titler, Lowenstein, Solomon, & Rossi, 1970; Stockwell, 1985). Efforts to quit drinking, such as during alcohol recovery, are sometimes successful to the extent that negative emotions can be avoided, but emotional distress tends to undermine and thwart the program of abstention (Hull, Young, & Jouriles, 1986; Pickens, Hatsukami, Spicer, & Svikis, 1985). Many people can apparently successfully manage to stay on the wagon during good times but relapse into serious drinking when personal problems and distress arise.

Gambling and compulsive shopping have been less extensively studied, but self-control of such behaviors likewise appears to fail during emotional distress (O'Guinn & Faber, 1987; Peck, 1986). People believe that gambling or shopping will make them feel better (Dickerson, 1991; Faber, 1992; Rook, 1987).

Aggression and violence are also influenced by self-control, and indeed Baumeister (1997b) concluded that the proximal cause of much violence is a breakdown of the internal restraints that normally keep people from acting on their angry impulses. Gottfred-

son and Hirschi (1990) proposed that low self-control is the most important factor in building a general theory of crime and criminality. Berkowitz (1989) proposed that all forms of negative affect contribute to increased aggression (i.e., not just frustration, as some previous views have held). If that view is correct, then many acts of aggression may well reflect the loss of self-control under the influence of emotional distress.

Finally, the capacity to delay gratification has long been one of the prototypes of self-control, insofar as it requires people to resist impulses and facilitates the enlightened pursuit of long-term self-interest (e.g., Mischel, 1996). The capacity to delay gratification is likewise vulnerable to emotional distress, however. Thinking about unhappy events leads to subsequent self-gratification and self-indulgence, as compared with thinking about neutral events (Mischel, Coates, & Raskoff, 1968; Schwartz & Pollack, 1977). Children who were instructed to reminisce about a sad event were subsequently less able to resist the temptation to play with a forbidden toy than were children who reminisced about a happy event (Fry, 1975). More generally, when people face a choice between immediate small rewards and larger but delayed rewards, emotional distress causes people to shift toward the former (Mischel, Ebbesen, & Zeiss, 1973; Underwood, Moore, & Rosenhan, 1973; Wertheim & Schwartz, 1983).

Why Does Distress Impair Regulation?

From the evidence presented in the preceding section, it appears to be well established that self-control breaks down when one is under emotional distress. In fact, the pervasiveness of the link between emotional distress and self-control failure suggests that the question is not whether but how negative affect produces these effects. It is very likely that there is more than one theoretical mechanism that answers this question. Several major theories have been proposed about why emotional distress impairs regulation.

Intentional Self-Destruction

One theory is based on psychodynamic theory and holds that some forms of emotional distress give rise to self-destructive tendencies. According to Piers and Singer (1953/1971), for example, guilt makes people desire to suffer or to be punished. A person who feels distress may therefore abandon the positive pursuit of desirable goals and even the normal conduct of healthy, adaptive behaviors because the aversive state generates self-defeating motivations.

Capacity

A second line of theory would predict that emotional distress prevents rational thought and therefore undermines the capacity to effectively regulate oneself. According to this view, people who are emotionally upset cease to function as rational, goal-oriented beings, and as a result, they become unable to regulate their behavior toward the pursuit of positive outcomes and goals. Variations on this hypothesis suggest that the emotionally distraught person may become impulsive, risk-oriented, arbitrary, or preoccupied. Leith and Baumeister (1996) found that some forms of emotional distress, especially those marked by high arousal, caused people to fail to think through the implications of their

actions, resulting in risky and potentially self-defeating actions. In contrast, low-arousal forms of emotional distress, such as sadness, have been found to produce more extensive processing of information (Clore, Schwarz, & Conway, 1994), and these forms of emotional distress might conceivably impair self-regulation if the processing of incoming information precluded attending to long-range goals.

The view that emotional distress impairs the capacity for effective self-regulation could also be phrased in terms of limited regulatory resources. Our own research has suggested that people's capacity for self-regulation depends on a limited resource akin to strength or energy (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven & Baumeister, 2000; Muraven, Tice, & Baumeister, 1998). In this view, people who are upset may expend their precious resources struggling with their feelings, and the resulting depletion of regulatory resources would leave them unable to regulate their behavior in other ways that would be more beneficial and constructive in the long run.

Motivation

Yet another line of theory suggests that emotional distress may impair the motivation (as opposed to the capacity) to regulate oneself in the normal, optimal fashion. This approach can be subdivided into apathy, rebellion, and self-efficacy hypotheses. The apathy version proposes that the person who is upset may simply cease to care about pursuing positive, desirable options and therefore becomes willing to contravene his or her own normal patterns of goal pursuit and healthy, constructive behavior. This approach differs from the previous theories because the distraught person is presumably still capable of effective self-regulation and does not have any explicit self-destructive impulses. The person simply no longer cares enough to put forth the exertion to do the right thing.

Meanwhile, the rebellion version would suggest that at least some forms of emotional distress cause the person to rebel against the seeming constraints of normal, proper behavior, and so the person may willfully engage in behaviors that thwart his or her normal behavioral regulation patterns. The self-efficacy version would propose that feeling upset would make the person feel incapable of successfully guiding behavior toward the realization of distal goals, and so the person would give up on them and concentrate on immediate gratification (see Bandura, 1977; Bandura & Schunk, 1981).

Priority Shift

Thus, the majority of theories about how distress impairs self-regulation emphasize impairment (of either capacity or motivation). The present investigation was spurred by the view that the effects on self-regulation may be strategic. Specifically, we propose that people may abandon or violate their normal self-regulatory efforts because they give priority to affect regulation over other forms of self-regulation. In plain terms, distress makes the quest for pleasure take precedence over impulse control.

Our reasoning was based on the assumption that affect regulation is not simply another sphere of self-control but in some sense a special case. The crux of this specialness is that impulse control

typically entails resisting one's desire for something that is expected to make the self feel good. Emotional distress intensifies the motivation to feel better, and so it may increase the subjective intensity or urgency of hedonistic desires and impulses. After all, an indulgence that might yield a pleasant state may be safely resisted if one already feels good: Yielding to temptation would produce only a small gain in affective state, as compared with how one feels now. In contrast, if one feels acutely bad—which is the essence of emotional distress—then the appeal of that very same pleasant state may be greatly enhanced because feeling that good would be a very welcome change from one's current state. In such an analysis, it seems eminently rational for a distressed person to yield to temptation.

The rationality is compromised, however, if one considers potential long-term costs of yielding to temptation. In the short run, people may indeed enjoy some escape from emotional distress by means of taking drugs or alcohol, committing sexual indiscretions, or gambling large sums of money. These temporary gains may, however, be outweighed by eventual outcomes such as addiction, arrest, marital breakup, sexually transmitted diseases, or financial ruin. The pursuit of short-term gains despite severe long-term risks and costs has been identified as a recurrent feature of self-defeating behaviors (Baumeister, 1997a; Baumeister & Scher, 1988; Platt, 1973).

More broadly, it is plausible that the human capacity for self-control evolved as adaptive precisely because it enabled people to resist immediate, proximal stimuli so as to pursue long-term benefits. The situational dilemma that forms the prototype of self-control is whether to pursue some immediate option of pleasure or instead to seek some (possibly delayed) benefit that requires sacrificing the proffered pleasure. People can easily make themselves forego options that offer them no pleasure or advantage. It is precisely the promise of immediate pleasure or gain that makes temptation difficult to resist. Thus, the successful pursuit of long-term goals depends on the ability to control and restrain impulses.

In a sense, people come to grief by giving undue priority to affect regulation. For example, a dieter may ordinarily be able to resist the pleasures of rich desserts or fried foods to pursue the long-term goals of fashionable slimness and good health. When that same dieter is emotionally upset, however, those long-term goals recede in importance, whereas the relatively urgent goal of feeling better enhances the temptation of the tasty but fattening foods. The person may be sorry months later when faced with the prospect of going out on a public beach in a skimpy swimsuit and revealing the excess cellulite to friends and gawkers. At the time, though, the immediate prospect of feeling better led to the indulgence.

In our analysis, then, emotional distress alters how people face the standard dilemma of whether to take immediate pleasure or to resist temptation in favor of long-term benefits. Our hypothesis was that distress shifts people toward favoring the immediate pleasure. Affect regulation (to relieve acute distress) overrides impulse control.

The Present Investigation

The present investigation was designed to show that impulse control fails because people give priority to affect regulation. It was necessary to show first that emotional distress impairs self-

control. As we already noted, however, there is ample evidence of such a link. Hence, although we have included some effort to replicate that link, it was not a central goal of this research.

The more difficult challenge was to demonstrate that affect regulation (as opposed to other, more direct consequences of negative affect) mediates the link between emotional distress and failure at impulse control. In other words, is it really because people are trying to feel better that they abandon self-control when they are under the influence of negative affect?

A creative procedure for demonstrating the specific mediating role of affect regulation was developed by Manucia et al. (1984). In previous research, Cialdini and colleagues (e.g., Cialdini, Darby, & Vincent, 1973; Cialdini & Kenrick, 1976) had established that emotional distress led to increases in helping behavior. However, the previous research fell short of the goal of demonstrating that people helped precisely in order to feel better. Manucia et al. accomplished this demonstration with a bogus mood-freezing manipulation. In their procedure, participants were given placebo drugs and told that these drugs would have the side effect of making it impossible for them to change their mood or emotional state for an hour or so. This manipulation rendered affect regulation useless, and so it should have eliminated any behaviors that were done principally for the sake of affect regulation. Sure enough, Manucia et al. found that the mood-freezing manipulation eliminated the increase in helping by sad, depressed people. In other words, sad people helped only when they believed that giving help could improve their emotional state, and not otherwise. The implication is that they helped so as to change their mood.

We adapted the mood-freezing procedure to test our hypothesis about emotional distress and impulse control. If emotional distress simply impairs the ability to regulate one's behavior, then impulse control should be poor among distraught people regardless of the mood-freezing manipulation. In contrast, if the mood-freezing manipulation eliminates the link between emotional distress and impulse control failure, then it would be reasonable to conclude that impulse control fails because emotional distress makes people seek ways of feeling better.

Recent research on aggression has provided some encouraging findings with regard to the present hypothesis. In laboratory experiments, participants were put into bad moods and then given a mood-freezing pill, just as in the procedure developed by Manucia et al. (1984). Among people who believed in catharsis and venting, aggression was significantly reduced (Bushman, Baumeister, & Phillips, in press). Thus, some people may apparently become aggressive as a way of making themselves feel better, especially if they believe that venting their negative affect will produce a cathartic release and a subsequent improvement in their affective state. Because aggression is a complex pattern of behavior that is not always associated with self-control failure, however (cf. Gottfredson & Hirschi, 1990), we felt it necessary to conduct studies using behaviors that are widely recognized as depending on self-control. We selected eating fattening foods (Study 1), delay of gratification (Study 2), and procrastination (Study 3). In all three cases, we sought to show that emotional distress would impair impulse control and increase the behavior and (more important) that this increase would be eliminated among people whose moods were believed to be frozen in the aversive state.

Experiment 1

Experiment 1 was designed to show that eating fattening, unhealthy foods that taste good would occur as an affect regulation strategy. Prior research (reviewed in the introduction) has established that emotional distress causes people to lose some control over their eating, resulting in episodes that break diets or even border on pathological eating binges. In this study, we sought to show that those episodes of overeating may be mediated by the hope that eating will make the person feel better.

Our research design was based on the mood-freezing procedure of Manucia et al. (1984), in the sense of seeking to demonstrate that a particular response (in our case, eating) to negative affect would be eliminated if participants were led to believe that their moods would not change. Instead of giving participants a placebo pill and telling them that it would make their mood state impervious to change for a time, we used a simpler procedure of informing some participants that eating would not improve their moods. Control participants received no such instruction and thus presumably sustained the common belief that eating tasty, fattening food is an effective way to cheer up.

Our prediction was that the induced sad, distressed mood would lead to an increase in eating among participants in the control condition. In the mood-freeze condition, however, no such increase would be found.

Method

Participants. Seventy-four students (43 men and 31 women) in introductory psychology courses participated in individual sessions of 45 min each. They received credit toward course requirements for their participation. They were randomly assigned to mood-induction and mood-freeze conditions.

Procedure. The experimenter explained that the purpose of the study was to investigate how emotional intelligence was related to certain personality traits. Participants were told that they would be taking a test of their emotional intelligence and filling out several personality questionnaires. The experimenter explained to participants that the test involved reading a real-life scenario and imagining themselves to be the main character in it. Thus, they were asked to imagine themselves in a particular situation and to experience and identify with the emotions provoked by it.

After participants signed a consent form, they were asked to read one of two stories. These stories were adapted from Wenzlaff, Wegner, and Roper (1988). In the distress condition, the story depicted a driver who was in a hurry and therefore ran a red light, thereby causing an accident that resulted in the death of a child. In contrast, the protagonist in the story in the happy condition saved a child's life. Participants were asked to read aloud the assigned story with the experimenter in the room. Then they were instructed to read it again to themselves and to imagine themselves in the given situation (as the main character). They were told to think about the emotions they felt and to write a brief essay summarizing how they felt at the moment. The experimenter left the room during this phase to give the participants time to concentrate on the story and the essay.

Next, the experimenter explained that it was necessary to wait at least 15 min to allow the sensory memory of the scenario to fade. During that time the participants were asked to take part in an ostensibly unrelated pilot study on the differences among people in the perception and taste of various kinds of foods. The taste test was presented as if it was unrelated to the mood manipulations, but in fact, it was the main dependent measure.

All participants were asked to taste three kinds of foods: pretzels, chocolate chip cookies, and small cheese ("goldfish") crackers. They were instructed to taste each kind of food and fill out a questionnaire rating each

food, and to this end, they were provided with bowls of food and rating forms.

The mood-freezing manipulation was introduced just before the experimenter left the room so the participants could conduct the taste test. In the mood-freeze condition, the experimenter said,

Even though people believe eating makes them feel better, scientific evidence points to the contrary. Eating does not make you feel better; if anything, it prolongs your current mood state for a period of time. Whatever mood you are in right now, you are very likely to stay in the same mood throughout the experiment.

Participants in the changeable mood (control) condition received no instructions about the effects of eating on mood.

After 10 min, the experimenter returned and asked the participants to fill out three additional questionnaires. The first was the Brief Mood Introspection Scale (Mayer & Gaschke, 1988), the second was the Dieting Restraint Scale (Herman & Polivy, 1975), and the third was a manipulation check. Then the experimenter debriefed, thanked, and dismissed the participants.

Results

Manipulation check. The mood induction was checked by an item asking participants how they felt after imagining themselves in their assigned scenario. A one-way analysis of variance (ANOVA) indicated that there was significant variation among the four conditions, $F(3, 70) = 136.45, p < .001$. Participants in the two distress conditions (i.e., both mood freeze [$M = 3.89$] and changeable mood [$M = 2.72$]) reported feeling much sadder than participants in the happy conditions ($M_s = 20.00$ and 19.10 , respectively).

Amount of food eaten. The quantity of snack food consumed by each participant constituted the main measure of (failed) impulse control. The pretzels, cookies, and crackers were counted by the experimenter (unbeknownst to the participant) before and after the taste test, and the amounts consumed by the participant were calculated by subtraction. These three measures were entered into a multivariate analysis of variance, which revealed significant variation among the conditions, $F(3, 68) = 2.82, p < .05$.

Probably the most appropriate measure was the total number of food morsels eaten. Because the three kinds of food differed in morsel size, and because the cheese cracker measure had high variance, we standardized within each food type and summed the three Z scores for each participant to create an index of total food eaten. The means are presented in Table 1. ANOVA performed on these totals yielded a significant interaction between induced mood state and changeability of mood, $F(1, 70) = 5.83, p < .05, d = .56$. Neither main effect was significant ($F_s < 1$). To test the specific prediction that distressed participants would eat more in the

changeable mood condition than in the frozen mood condition, we computed a pairwise comparison, which revealed a significant difference consistent with the hypothesis, $t(34) = 2.09, p < .05, d = .72$. Thus, people in an ostensibly frozen sad mood ate less than people in a sad but changeable mood.

Mood. Each of the two subscales on the Brief Mood Introspection Scale was subjected to ANOVA. The mood manipulation had a significant effect on the Valence subscale, $F(1, 70) = 4.85, p < .05$, indicating that people in the distress condition ($M = 14.92$) felt more negative than people in the happy condition ($M = 20.53$). No other effect was significant on this subscale. With regard to the Arousal subscale, no effects were significant.

To investigate any actual link between eating and final mood, we computed correlations between the total amount of food eaten and the Valence subscale score from the Brief Mood Introspection Scale. Across all conditions, the correlation was .13 (*ns*). In the distressed mood/changeable mood condition, the effect was also not significant ($r = .12, ns$). Thus, there was no significant evidence that eating more caused people to feel better.

Dieting status. Amount of food eaten was further analyzed by using scores on the Restraint Scale as an independent variable. Dieting (restraint) status had no main effects, nor did it interact with experimental condition.

Discussion

The results were largely consistent with our predictions. Under circumstances similar to everyday life, in which moods and emotional states can be changed, emotional distress led people to increase their consumption of snack foods. However, this pattern was eliminated and even reversed when people were told that their moods would not change during the experiment. Thus, the mood-freezing manipulation eliminated the tendency to eat more as a response to feeling bad. These findings suggest that people typically respond to distress by eating more fattening, unhealthy foods because they expect that enjoying such treats will make them feel better.

Several issues in the pattern of findings deserve comment. First, we observed some relative increase in eating among people whose moods were allegedly frozen in the happy condition. A likely explanation for this observation is that our mood-freezing procedure included an instruction suggesting that eating would tend to hold people's moods constant and prevent change. We said this on the assumption that all participants would be eating at least some amount, but participants may have taken it to mean that the more they ate, the longer their current state would continue. Although this instruction probably helped the mood-freezing manipulation have the desired effect in the distress condition, it may have had the unanticipated effect of making happy participants believe that eating would be a good affect regulation strategy for preserving their good mood. In other words, if you feel good, and you believe that eating will cause you to continue to feel good, it is rational to eat.

The second surprise in the data was that dieting status, as measured by the Restraint Scale, did not moderate the results. We had anticipated that effects would be strongest among dieters because they routinely engage in the self-control of eating, and so the loss of impulse control caused by emotional distress would be strongest for them. In this experiment, everyone behaved as we

Table 1
Total Amount of Snack Foods Eaten

Condition	Mood freeze	Changeable mood
Happy	0.49 (1.78)	-0.35 (2.30)
Distress	-0.89 (1.62)	0.79 (3.00)

Note. These numbers represent mean sums of standardized scores on amounts of cookies, pretzels, and cheese crackers. High positive scores indicate more eating. Standard deviations are in parentheses.

hypothesized the dieters would—that is, eating more under the effects of distress (but only as long as the bad mood was believed to be changeable). Conversations with our participants suggested a reason for this pattern: Almost all participants regarded the snack foods as relatively unhealthy and fattening, and so reluctance to eat these foods was not confined to dieters.

Third, we did not find that eating had any effect on mood, even in the participants who believed that their moods were changeable. This finding is consistent with previous evidence that eating does not actually accomplish lasting mood change, even though people may believe that it does (see Thayer, 1987, 1996; Thayer, Newman, & McClain, 1994). Despite this consistency with previous research, it does raise a question about why people apparently use eating as a self-regulatory strategy (as the present findings suggest). One possibility is that eating produces only a very ephemeral uplift in mood, possibly lasting only as long as one is distracted by the pleasant sensations of chewing and swallowing, and afterward the mood quickly reverts to its previous low level. Some observations about binge eating fit this conclusion (e.g., Lindner, 1954). Another possibility is that people are misguided in their beliefs that eating will improve their moods, and although they may eat with that positive expectation, the actual payoff in terms of mood repair tends to be disappointing.

Last, we acknowledge an asymmetry in the procedures for the two conditions. The mood-freeze condition called attention to the possible link between eating and mood, whereas the control (changeable mood) condition had no such instructions. Focusing on one's eating and one's mood could conceivably alter the way these are experienced and the way the person deals with them. Although we cannot imagine exactly how the increased attention to mood or eating would explain the results of this study, the possibility must be kept in mind that there could have been some influence. Hence, we needed to follow up these findings by using different procedures and, preferably, different spheres of self-regulation.

Experiment 2

The hypothesis for our second experiment was the same as that for the first experiment—namely, that emotional distress would impair impulse control only when moods were perceived as changeable. It seemed essential to replicate the findings of Experiment 1 with a different dependent variable to ensure that the effects were not limited to eating. We selected a variable that has long been centrally regarded as a major form of self-control: delay of gratification. In fact, the pioneering research by Mischel (1974, 1996) on delay of gratification provided important foundations for the extensive subsequent research on self-regulation. As noted in our introduction, emotional distress has been shown to undermine the capacity to delay gratification and to engender a shift toward preferring immediate pleasure instead of delayed but possibly greater benefits.

Most research on delay of gratification has been done with children. A likely reason is that the time spans that can effectively be manipulated in laboratory experiments seem more substantial and therefore more daunting to children than to adults. College students, after all, are typically already engaged in a multiyear exercise in delay of gratification, insofar as attending college requires them to sacrifice short-term benefits such as higher pay so as to pursue a degree that will presumably enable them to earn

substantially higher salaries down the road. To them, therefore, a 20-min delay to receive extra money or candy might seem trivial.

Hence, we intensified the delay-of-gratification dilemma by adapting a resource dilemma (or "social trap") paradigm. Knapp and Clark (1991) developed a procedure based on a fishery simulation, in which the number of fish in the lake will increase over time by reproduction and can be harvested for monetary profit at any time. The player receives money for harvesting fish immediately, but over the course of the game, more money can be gained by postponing the harvesting until the fish reproduce up to the maximum carrying capacity of the lake. Premature harvesting reduces the number of fish that can reproduce and thereby reduces the eventual profits. Knapp and Clark found that adult participants who were in a sad mood tended to take their profits relatively early, thereby reducing their total profits. The researchers speculated that the desire to remedy the sad mood caused these people to take early profits instead of delaying gratification, but they had no evidence that this was the case. Our investigation was intended to show (by using a mood-freezing procedure) that affect regulation was in fact the mediating variable.

A second goal of Experiment 2 was to demonstrate that individual differences in self-controlling tendencies could moderate the effect. Such evidence would help confirm that self-control is indeed a decisive mediator of the behavioral changes following emotional distress. Had dieting status moderated the findings of Study 1, that would have provided such evidence, but instead we found that everyone behaved according to the pattern that was predicted for dieters. For Experiment 2, therefore, we used a scale specifically targeted to measure individual differences in affect and mood regulation.

The Generalized Expectancies for Negative Mood Regulation (NMR) Scale was developed by Catanzaro and Mearns (1990) to measure beliefs in one's ability to terminate or alleviate aversive moods and emotional distress. High scores on this scale reflect a broad belief that one can successfully make oneself feel better. We predicted that people who scored high on the NMR scale would exhibit the affect priority shift we found in Experiment 1: Under emotional distress, they should show an increased preference for immediate gratification (thus, a decrement in impulse control), but freezing their mood should eliminate this effect. People who score low on the NMR scale presumably do not believe that they can (or should) control their moods anyway, and so the distress and mood-freezing manipulations should have relatively little effect on them.

To increase generality, the mood-freezing manipulation was altered. Experiment 1 relied on instructions that specified that eating would not produce a change in mood (and might in fact prevent change). Experiment 2 used a cover story of aromatherapy to accomplish the manipulation of mood freezing. Specifically, participants were instructed to smell a candle such as would ostensibly be used in aromatherapy. Then they were told that one common effect of exposure to such an aroma is a temporary fixation of one's mood.

Method

Participants. Forty-seven students (26 men and 21 women) in introductory psychology courses took part in 1-hr individual sessions. They were randomly assigned to mood-freeze and changeable mood (control) conditions.

Measures. The NMR scale (Catanzaro & Mearns, 1990) contains 30 items all beginning with the same stem, "When I'm upset, I believe that . . .," followed by various statements about expected possible changes to that mood. Responses are on a 5-point scale with answers ranging from strong disagreement to strong agreement. Reliability and validity of the NMR scale have been demonstrated in a series of articles by Catanzaro and colleagues (Brashares & Catanzaro, 1994; Catanzaro, Horaney, & Creasey, 1995; Catanzaro & Laurent, 1996). It has also been shown to correlate negatively with the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979). NMR scale responses also predict the effectiveness of affective coping responses (Catanzaro & Mearns, 1999). People who score high on the NMR scale report less frequent dysphoric moods (Kirsch, Mearns, & Catanzaro, 1990) and are more likely than others to engage in active coping strategies after a romantic breakup (Mearns, 1991). High scorers have also been shown to generate more positive cognitions in response to a laboratory induction of a bad mood (Smith & Petty, 1995).

Procedure. On arrival at the laboratory, participants received an initial briefing and signed informed-consent forms. They filled out the NMR scale (Catanzaro & Mearns, 1990). The experimenter explained the purpose of the study as investigating how emotional intelligence is related to problem-solving skills. As in Experiment 1, the experimenter said that the test of emotional intelligence would involve reading a scenario and imagining oneself involved in it as the main character.

All participants then underwent the emotional distress manipulation. We used the same procedure as that used in Experiment 1, in which the participant imagined himself or herself driving fast because of being late and then causing an accident in which a child was killed (from Wenzlaff et al., 1988). The good mood induction condition was not included.

The mood-freezing part of the procedure was begun right after the mood induction. The experimenter explained (to all participants) that she was also studying the effects of smell and taste on people's problem-solving skills. The experimenter told the participants that some research has indicated that aromatherapy might have very positive effects on people's ability to think clearly. She produced and lit a scented candle and instructed participants to spend a few minutes sitting with their eyes closed, thinking about the story they had read and how it made them feel.

At that point, the mood-freeze and changeable mood conditions diverged. The mood-freeze condition participants were told that one of the most common consequences of aromatherapy is a temporary fixation of one's current mood. The experimenter said that this made moods temporarily resistant to change from normal events. In contrast, the changeable mood condition participants received no instructions about mood fixation or change.

The resource dilemma task came next, presented as a measure of problem-solving skills. The task was administered as a computer game. The experimenter told all participants that their task was to maximize their profit from a pool of resources. They were told that the ability to do well on this type of problem-solving exercise had been shown to be highly predictive of academic intelligence and success in school.

The task itself was adapted from Knapp and Clark (1991) and an original method developed by Brechner (1977). Participants were instructed to role-play catching fish from a pool. Meanwhile, the fish would replenish themselves at a rate that depended on the number of fish remaining. Following Knapp and Clark, the experimenter said,

In this game we are simulating how a fisherman goes about fishing from a lake. You will be this fisherman and can catch tons of fish. In each trial you are allowed to catch either nothing at all, or as many tons of fish as you like. However, the stock of fish is not unlimited. The amount of fish in the lake decreases whenever something is taken out. On the other hand the fish will also propagate as long as there are enough of them in the lake. I will tell you when the game is over. However, if the stock drops to 0 at any time, the game is automatically over.

The experimenter finished by reminding participants that the total quantity of fish they caught would be reflected in their score on the problem-solving task.

Participants played for real money, and the experimenter emphasized that each participant would get to keep all the money he or she earned. The rate of pay was explained as amounting to \$0.01 per ton of fish caught. The amount that the participant earned was constantly displayed throughout the game (updated constantly). Optimal performance on the game could have earned the participant in excess of \$10, which would be regarded as a large bonus by most undergraduates at our university. Actual earnings among participants ranged from \$0.17 to \$4.41.

When the instructions were finished and any questions had been answered, the participant was then seated at the computer and began working on the task. For each trial, the computer notified the participant about how many fish were in the lake, and the participant responded by indicating how many tons of fish he or she chose to catch. Then the quantity of fish remaining in the lake was increased by a replenishment function for the next trial. The replenishment rate was defined by a continuous inverted-U function (Knapp & Clark, 1991), which was designed to model the pattern that a relative lack of fish in the pool would permit very little reproduction as well as a ceiling effect such that as the pool of fish approached the environment's carrying capacity relatively few new fish would be added. To be successful, the participant had to estimate how many fish could be taken from the lake to maintain the maximum replenishment. Such prudent and restrained management of the resource typically conflicts with any impulse to quickly make more money by catching a larger number of fish.

After 25 trials, the experimenter stopped the game and administered the Brief Mood Introspection Scale (Mayer & Gaschke, 1988) and the manipulation check. Participants were then debriefed, thanked, and dismissed.

Results

Manipulation check. The mood induction was successful insofar as people reported a very distressed mood ($M = 2.98$ on a 25-point scale). There were no differences between participants in the mood-freeze and changeable mood (control) conditions in mood, enjoyment of the game, or self-reported motivation to catch many fish.

Delay of gratification. The main dependent measures were (a) the total score achieved by the participant over the course of the 25 trials and (b) the number of fish remaining in the lake after the 25th trial. (Because we had not alerted participants as to when the game would end, optimal management involved still having an ample resource of fish after the 25th trial. In contrast, if people had known that the 25th trial would be the last, then the optimal strategy would have been to consume all the remaining fish on that trial.) The first measure indicated how well the participant succeeded at performing the game in the sense of earning actual money to keep. The second measure more purely reflected success at delaying gratification, insofar as high scores indicate that players had effectively managed their resource so that it could continue paying well indefinitely, if the game had not been arbitrarily and unexpectedly terminated.

These scores were entered into a linear regression analysis. The analysis revealed a significant interaction between condition (mood freeze versus changeable mood) and NMR trait score on both measures: For final pay, $\beta = -0.30$, $t(43) = 2.03$, $p < .05$, $r^2 = .105$, $d = .68$, and for final fish count, $\beta = -0.30$, $t(43) = 2.10$, $p < .05$, $r^2 = .173$, $d = .91$. The interaction indicated that people high in trait NMR more strongly adapted their behavior in response to the mood-freezing manipulation than people scoring low on that trait.

To clarify the effects, we subjected the NMR scale scores to a median split. The results are depicted in Tables 2 and 3. Participants who scored low on the NMR scale did not show any significant differences between the mood-freeze and changeable mood (control) conditions on final pay ($M_s = 183.50$ and 213.38 , respectively), $t(21) < 1$, or final fish count ($M_s = 78.40$ and 74.75 , respectively), $t < 1$. In contrast, high scorers on the NMR scale did seem to respond differently to the mood-freeze and changeable mood conditions. Although the difference in final pay did not reach significance, the difference in final fish count was significant, with high regulators in the mood-freeze condition having a much more substantial remaining stock of fish ($M = 110.88$) than high regulators in the changeable mood condition ($M = 46.81$), $t(22) = 2.75$, $p < .05$. Thus, the high regulators who believed their moods were frozen were much more effective in pursuing an optimal long-term strategy. To be sure, the median split analyses yielded weaker results than the regression analyses reported in the preceding paragraph, but this probably just indicates the loss of statistical power that comes from collapsing a continuum of scores into a dichotomy.

Our reasoning was based on the assumption that some people would respond to distress by seeking immediate gratification. Hence, one might predict that strong results would emerge quite early in the procedure. To investigate this possibility, we assessed the fish counts after six trials, which seemed long enough for the effects of conservative versus spendthrift management strategies to emerge. Sure enough, the high regulators had already achieved a significantly larger stock of fish after those first few trials if they were in the mood-freeze condition ($M = 101.63$) than if they were in the changeable mood condition ($M = 43.94$), $t(22) = 3.02$, $p < .01$. Among low regulators, the corresponding difference was not significant and in fact showed a trend in the opposite direction, $t(21) = 1.15$, *ns*. The regression analysis (using the full range of NMR scale scores) on the fish count after six trials showed a significant interaction between NMR scale scores and mood-freeze condition, $\beta = 0.33$, $t(46) = 2.29$, $p < .05$, $d = .87$. The corresponding analysis on the amount earned in the first six trials did not yield a significant interaction, however. Still, these results provide some support for the view that the differences in impulse control emerged on the earliest trials, as would be predicted by the hypothesis that emotional distress promotes a focus on the immediate present.

Mood state. The two experimental conditions were compared on each of the two subscales of the Brief Mood Introspection Scale. Neither arousal nor valence showed any difference. There was also no evidence of any interaction between NMR and conditions. The NMR scale did yield a main effect on mood valence,

Table 2
Mean Amount Earned (in Cents)

NMR scale score	Mood freeze	Changeable mood
High	216.31 (84.53)	164.31 (130.34)
Low	183.50 (144.38)	213.38 (169.69)

Note. High scores reflect success at the game, based on effective delay of gratification and hence good management of the resource. Standard deviations are in parentheses. NMR scale = Generalized Expectancies for Negative Mood Regulation scale.

Table 3
Number of Fish Remaining at Game's End

NMR scale score	Mood freeze	Changeable mood
High	110.88 (52.72)	46.81 (54.19)
Low	78.40 (70.01)	74.75 (69.08)

Note. High scores indicate high delay of gratification. Standard deviations are in parentheses. NMR scale = Generalized Expectancies for Negative Mood Regulation scale.

$F(1, 45) = 12.25$, $p < .01$, indicating that high mood regulators ended up in a better mood. The NMR scale did not have a main effect on arousal.

As in Study 1, we sought to verify any actual affective improvements by computing correlations between final mood valence and the measures of self-regulation. Across all cells, the correlation between final mood and final fish count was $-.34$ ($p < .05$), indicating that the more fish they left in the pool, the worse they felt. For final pay, the correlation with mood was $-.24$ (*ns*). For participants in the changeable mood condition only, final fish count correlated with mood $-.34$ (*ns*). With final pay, the correlation was $-.25$ (*ns*). The significance levels of these correlations varied with the sample size, but the patterns of results seem quite consistent. The participants who more successfully delayed gratification ended up feeling worse.

Discussion

The findings from Experiment 2 provide a conceptual replication of the effect observed in Experiment 1. Knapp and Clark (1991) showed that bad moods caused people to delay gratification less effectively in a resource game such as this. Our findings suggest that the failure to delay gratification is contingent on the belief that one's mood can change. When participants were led to believe that their moods would not be changeable, they delayed gratification more effectively. Indeed, some differences already reached significance on the first few trials, which underscores the short-term focus on immediate gratification that our reasoning assumed. The finding that this effect was moderated by trait scores on the NMR scale (Catanzaro & Mearns, 1990) confirms the importance of self-regulation to this pattern, as well as attesting to the usefulness of that scale. Participants who habitually regulated their bad moods showed this difference more strongly than other participants, which helps confirm that mood regulation is central to the pattern we observed.

All participants were put in a bad mood at the start of the study. People who scored high on the NMR scale ended the study in better moods than people who scored low on the scale, which provides further evidence of the validity of the scale: In other words, habitual mood regulators did successfully regulate their moods. However, this effect was independent of the mood-freezing manipulation, which implies that it was obtained even among the participants who were supposedly not changing their behavior for the sake of mood regulation (because their moods were ostensibly frozen).

We also found that participants who more thoroughly delayed gratification ended up in worse moods, as indicated by a correlation between final fish count and final mood. These results can be

interpreted as supporting the view that people who sought immediate gratification did feel better. They show that people who most effectively postponed gratification ended up in a less positive mood than people who depleted their fish stocks by a short-term strategy of early harvesting. However, there is one other aspect of the situation that could have affected the final mood ratings, which is that they were obtained just after the unexpected and seemingly arbitrary termination of the procedure. At the end of the procedure, participants may have realized that they could have earned more money by taking more fish at the end. In other words, the experiment ended with a sense of lost opportunity for all participants, and the more they had lost, the worse they felt. The mood findings therefore do not unambiguously indicate that indulging in immediate gratification led to mood improvement. Moreover, the lack of difference between the frozen mood and changeable mood conditions likewise raises doubts that strategic mood regulation through immediate gratification was successful.

Experiment 3

Our third study examined the impact of changeable versus frozen moods on yet another pattern of behavior: procrastination. Procrastination involves squandering time prior to a deadline. In this study, we led people to anticipate an important ego-relevant test of their abilities, and we gave them an opportunity to practice for the test. They could, however, devote any part of the practice period to task-irrelevant, time-wasting activities such as playing with puzzles or reading magazines. We reasoned that optimal self-regulation would entail devoting one's efforts to preparing for the test and resisting impulses to indulge in frivolous, task-irrelevant pastimes.

Procrastination has been linked in multiple studies to self-regulation deficits. Correlational findings from questionnaire research point toward the self-control deficit explanation. Flett, Hewitt, and Martin (1995) administered a measure of dispositional self-control and found that procrastinators scored low on it (thus reflecting poor self-control). Poor work discipline has also been linked to procrastination (Shouwenburg, 1995). Among the Big Five personality traits, low Conscientiousness is the trait most commonly associated with procrastination (Ferrari, Johnson, & McCown, 1995). Apart from these empirical findings, conceptual analysis suggests that procrastination would be negatively linked to poor self-regulation, insofar as neglecting work reflects a lack of self-discipline. A longitudinal study by Tice and Baumeister (1997) found that procrastinators performed worse than others on all performance measures, despite other findings that procrastinators do not lack for intelligence or other ability. Apparently putting off work until the last minute impairs one's ability to perform effectively. It certainly tends to leave less total time available for work.

Why do people procrastinate? Multiple reasons certainly exist (see Ferrari et al., 1995), but one class of explanation focuses on the emotional consequences of working versus engaging in alternative pursuits. Working toward assigned goals can be tedious or aversive, and when there are high expectations or pressures for good performance, working on tasks may generate anxiety and other forms of distress. Instead of working, people may find it more appealing to engage in play or leisure activities, which are intrinsically enjoyable.

Study 3 used a laboratory paradigm that was specially developed to examine whether people work to prepare for an upcoming test or engage in time-wasting, distracting activities instead. All participants were told that they would soon be given a challenging and important test of their intellectual abilities. They were left alone for 15 min to practice for this test. During this practice period, however, they were not required to practice, and indeed they were provided with several alternative activities.

The core of the design was the same as that used in Study 1: People were put into either a good or a bad mood, and they were told that their moods were either frozen (by the effects of aromatherapy candles) or changeable. Again, our prediction was that procrastination would mainly occur among people who were in a bad mood and who believed they could change their mood by engaging in other activities that would be more appealing than practicing for a multiplication test.

The appeal of the alternative activities is theoretically essential to our reasoning. We held that the reason why people procrastinate is to make themselves feel better immediately. This rationale works only if the alternative time-wasting task is anticipated to be enjoyable. Hence, we added a third independent variable to the design, namely, the appeal of the alternative distracting tasks. Half of the participants were confronted with the choice between practicing for the math test and engaging in fun activities such as doing a challenging puzzle, playing a video game, or reading current and entertaining magazines. The other half of the participants were given seemingly less appealing options as alternatives to practicing their multiplication skills. Their puzzles were designed for young children and hence would not appeal to college students, and the magazines that were available for them to read were technical journals that were several years old and out of date.

We predicted that the people in the bad, changeable moods would sacrifice their practice time to engage in the enjoyable tasks but would not sacrifice their practice time for the relatively boring tasks. Although this prediction may seem straightforward, other theories would dispute it. Some theories about procrastination have emphasized that people simply want to avoid their work because it may be threatening or because they fear they cannot perform up to their own or others' expectations (see Ferrari et al., 1995, for a review). If task avoidance is the main driving force, then it should not matter much whether the distractor tasks are stimulating or not. Other views emphasize that emotional distress may reduce people's motivation to work on assigned tasks or cause them to rebel against extrinsic assignments, and these views would again argue that the entertainment value of the alternative tasks would make little or no difference. Changeability of mood should also play a minimal role if those theories are correct. Thus, although our hypothesis led to a prediction of a three-way interaction among mood, changeability of mood, and appeal of distractor tasks, simpler patterns of results could be predicted on the basis of competing theories.

Method

Participants and design. Participants were 90 (42 male and 48 female) undergraduate psychology students who participated for course credit. Two male participants were dropped because of failure to follow directions and complete the experiment, leaving a total of 88 participants. They were run individually.

The study consisted of a 2 (good mood vs. bad mood) $\times$ 2 (mood could change vs. mood was frozen) $\times$ 2 (fun distractors vs. boring distractors during the practice session) design. The dependent variable was the amount of time participants procrastinated before taking an important test. Procrastination was operationally defined as playing with the toys and magazines or doing anything other than practicing for the test (e.g., staring into space or adjusting a watch).

Procedure. On entering the laboratory, participants were asked to sign a consent form and were told that the study involved the effects of aromatherapy and mood on color matching and that while they were waiting for the second part of the mood study, they would also complete a portion of a nonverbal intelligence test. They were told that they would be asked to read a scenario and describe the effects that the reading had on their mood. They were also told that their mood would be affected by the aromatherapy influence of a candle that the experimenter would light while they were reading the scenario. Half of the participants were told that their moods would be frozen and unchangeable while the candle was lit, and the other half of the participants were told that they were in the control condition and their moods, unlike the moods of the participants in the other condition, could change over time as moods normally do.

The intelligence test, which the participants were to take while undergoing the effects of the aromatherapy, was then described. The participants were told that the test consisted of a number of arithmetic problems and that research had demonstrated that the ability to quickly and accurately solve complex arithmetic problems is highly predictive of quantitative reasoning, analytical abilities, and fluid thinking, all of which are highly important skills for real-world success. The problems involved three-digit multiplication so that no student would feel that the problems were too complex for his or her mathematical ability. In prior testing, all students in the class felt mathematically competent enough to solve these multiplication problems.

Participants were told that they would be tested for 10 min and that they were to complete as many problems as accurately as possible in the 10 min. They were told that they would receive feedback about their quantitative reasoning, analytical abilities, and fluid thinking before they left the experiment. They were also told that because most students (even math students) were accustomed to using a calculator for such straightforward and tedious calculations, having math classes and experience beyond about seventh or eighth grade math did not confer any additional expertise. Indeed, they were told that the reason this test was so useful was because it appeared to be independent of math background (at least beyond junior high school).

Because most students were accustomed to using a calculator for such straightforward and tedious calculations, participants were told that they would have a chance to practice the calculations for a bit before they took the test. They were told that most students showed significant improvement if they practiced for 10–15 min but that research suggested that the practice effects leveled off after about 15 min, so that additional practice did not lead to additional increases in performance beyond 15 min of practice. Because performance increased with practice for the first 10–15 min, however, students were told that they would be left alone to practice the equations as much as they wanted for 15 min. They were told that they should practice the equations for at least some of that time, but if they did not want to practice the equations for the full 15 min, they could engage in any of the other tasks in the room until the experimenter came back after 15 min. The experimenter described the other tasks in the room as “time wasters” and explained that she liked to play with them when her appointments did not show up and she had extra time to pass. For participants in the fun tasks condition, the tasks consisted of a challenging plastic puzzle, a video game, and several current popular magazines. For participants in the boring tasks condition, the tasks consisted of a preschool-level plastic puzzle, a preschool-level electronic puzzle game, and several out-of-date technical journals. Pretesting established that the tasks in the fun condition

were enjoyed by participants significantly more than tasks in the boring condition.

After giving participants an overview of the experiment, the experimenter induced a positive or a negative mood in the same way as in Study 1, using the scenarios and having participants reflect on their feelings about events in the scenarios. Mood freezing versus ability to escape mood was manipulated using the aromatherapy candles as in Study 2. After completing the mood and mood-freezing manipulations, the experimenter explained that the participants would complete the color matching task in 30 min but told the participants that they would complete the intelligence test that had been described previously during the 30-min wait. They were reminded to practice the math equations for at least a portion of the 15-min practice time before the intelligence test. A clock was in the room; the experimenter motioned to it and told participants that she would return at X time (a time 15 min later than the current time).

The experimenter left the room for 15 min and observed the participants' behavior through a one-way mirror. Although the mirror was entirely covered by curtains to reduce participants' concern about being observed, a tiny fold in the curtain allowed the experimenter to see into the room without the participants' knowledge. The experimenter had a metronome device that sounded a faint tone every 30 s, and she recorded what the participants were doing when the beep sounded. Three categories of responses were recorded: practicing math, playing with the games or magazines, and “other” (e.g., brushing hair, opening desk drawers and going through the contents, biting nails). The experimenter made a mark next to the category that best represented what the participants were doing when the metronome sounded.

At the end of the 15 min, a chime sounded on the metronome, and the experimenter returned to the participants. She asked participants to rate their moods, told them that they would not have to complete either the intelligence test or the color matching test, and then asked the participants to estimate how much time they practiced for the test and how much time they spent doing other things during the practice session. The experimenter then debriefed the participants, making sure that all participants understood the purpose of the experiment and the use of deception. All participants were then given a small gift of additional class credits to completely undo any effects of the negative mood induction (or any lingering negative effects from any of the manipulations). Mood was again assessed to ensure that all participants left the experiment in a positive mood.

Results

The main dependent variable was procrastination, which was measured by the amount of time that participants spent on any activities other than practicing for the upcoming test. There was a main effect for mood freezing, with participants in the normal, changeable mood condition procrastinating significantly more ($M = 9.96$ min) than participants in the frozen mood condition, ($M = 7.29$), $F(1, 80) = 16.22$, $p < .001$. Two significant two-way interactions were also revealed. The interaction between fun versus boring tasks and mood freezing was significant, $F(1, 80) = 5.30$, $p < .02$. The interaction between good versus bad moods and mood freezing was also significant, $F(1, 80) = 4.12$, $p < .04$. All of these effects were qualified, however, by the three-way interaction between fun versus boring tasks, mood freezing, and good versus bad moods, $F(1, 80) = 12.63$, $p < .001$. The three-way interaction supports the initial predictions and takes precedence over other findings.

An examination of the means revealed that participants who were in a bad mood, who believed they could change their mood, and who had fun tasks on hand procrastinated significantly more than any other group. A contrast analysis was performed to com-

pare participants in that condition with participants in all other conditions. This analysis revealed a significant effect, $F(1, 80) = 32.70, p < .0001$. Participants did indeed procrastinate more in that condition than in all others. The means are presented in Table 4.

Discussion

The results of Study 3 provide further support for the hypothesis that affect regulation attempts constitute an important link between emotional distress and regulatory failure. This study examined procrastination as operationalized by engaging in task-irrelevant activities instead of working to prepare for an upcoming test. Although some degree of procrastination was found in all conditions, one condition stood out as eliciting more procrastination than all others. Procrastination was highest when people were in a bad mood, when they believed that their mood could be changed, and when the alternative (procrastinating) options appeared to be highly enjoyable. Indeed, in that condition, participants hardly worked on their multiplication task at all, instead procrastinating for a mean of 13.7 out of 15 min. This was higher than in any other condition and significantly higher than the pooled mean of all other conditions.

Several competing predictions were disconfirmed. One might have predicted that all participants would prefer to engage in the pleasant distracting activities than the boring ones. There was, however, no main effect in support of that prediction. In some conditions, such as among people who believed their bad moods were fixed and frozen, the trend was in the opposite direction (i.e., toward devoting more time to the boring than the enjoyable distractors). Likewise, we noted several predictions based on the idea that people simply avoid assigned tasks, perhaps especially when they are in bad moods, but no main effect of mood on procrastination was found.

Thus, the induced bad mood led people to procrastinate instead of working to prepare for the upcoming test, but this effect depended on very specific and important contingencies. The effect of the bad mood was eliminated when the alternative options were relatively boring, indicating that procrastination was caused in part by the appeal and anticipated enjoyment of the distractor tasks. The effect of the bad mood was also eliminated by telling people that their moods were not susceptible to change (because of the

aromatherapy candles), which shows that procrastination was motivated by the desire to change their mood.

Put another way, most people in most conditions spent about half of their free time preparing for the upcoming test. Although practicing multiplication problems is not regarded as intrinsically enjoyable by most people, they were able to regulate their behavior and make themselves do it because it was presented as important. The one major exception was people who felt bad and perceived that giving in to temptation (in this case, to engage in enjoyable activities) would bring about a short-term improvement in their mood.

Although this procedure was developed to model procrastination, some readers might object that it does not precisely involve postponing activity that has to be done later, which would constitute the most strict and narrow definition of procrastination. We have elected to present it as procrastination because we think that in reality procrastination does often lead to a reduction in the amount of time spent on the task—for example, student procrastinators end up studying less than nonprocrastinators because they discover at the last minute that they cannot do justice to the assignment in the remaining time. Still, for purists who might object to characterizing this procedure as showing procrastination, we offer a looser explanation in terms of preparatory effort. For the sake of our interest in self-control failure, the implications are the same: By neglecting to practice, one ends up impairing subsequent performance and hence achieving a lesser outcome.

General Discussion

We began with the hypothesis that certain impulsive or self-indulgent behaviors are not always simply a sign of reduced control—rather, they may be strategic efforts at affect regulation. We described evidence (and replicated in our studies) that emotional distress leads to various apparent breakdowns of impulse control. Our most important findings from these three studies showed that these negative effects of emotional distress on impulse control could be eliminated by telling people that their moods were temporarily immune to change. When our participants believed their moods were susceptible to change, as people normally do, then they responded to bad moods by increasing various impulsive behaviors: eating (Study 1), immediate gratification (Study 2), and procrastination (Study 3). All these effects vanished, however, when people were led to believe that these impulsive acts would not lead to mood improvement (because the moods were frozen).

In the introduction to this article, we articulated several of the main lines of theorizing about how emotional distress produces impairments in self-regulation. The results of the present investigation help distinguish among these many models.

One line of thought was that self-regulation produces self-destructive intentions or motivations. That is, people who are upset may become self-destructive in the sense that they abandon their normal constructive pursuits because they are attracted to self-harm. There was no support for this view in the present findings. We induced emotional distress in all three studies, and in none of them did people actively seek to suffer or fail. Indeed, in Study 3 we offered two different types of alternative distracting activities, one of which was pleasant and appealing and the other of which was boring. If people wanted to make themselves suffer as a consequence of the induced distress, they would have presumably

Table 4
Amount of Procrastination

Mood	Frozen mood	Changeable mood
Fun distractors		
Good	7.59 (2.78)	8.09 (3.26)
Bad	5.68 (3.65)	13.68 (1.42)
Boring distractors		
Good	7.86 (3.22)	9.86 (2.41)
Bad	8.05 (3.71)	8.18 (3.96)

Note. Scores represent mean time, in minutes, that the participants spent doing anything other than practicing the arithmetic problems. Standard deviations are in parentheses.

chosen the unpleasant activities but eschewed the pleasant and appealing ones. The opposite was found. In short, there was no sign that people became actively self-defeating under the influence of emotional distress.

A second approach proposed that emotional distress impairs the capacity for self-regulation, such as by impairing rational thought or consuming resources needed for self-regulation. Our data contradicted both of these views. The mood-freezing manipulation was, after all, a deception, and there is no reason that it should have altered the capacity for rational thought. But it eliminated the effects of emotional distress. Negative moods were induced to the same extent in both the mood-freeze and changeable mood conditions, and if those bad moods were sufficient to impair the capacity for effective self-regulation, then both conditions should have exhibited decrements in self-regulation. They did not. Our participants were clearly capable of effective self-regulation even when distress had been induced.

These findings also seem inconsistent with the view that the effects of emotional distress on information processing changed the person's capacity to appreciate long-term goals and benefits. Prior evidence suggests that sadness increases processing of certain kinds of information, whereas high arousal distress curtails processing and produces impulsive, risky behavior (cf. Clore et al., 1994; Leith & Baumeister, 1996). One might speculatively extend either of those arguments to explain why upset people accept immediate gratification rather than pursue long-term benefits. Again, though, the mood was the same in both the changeable and frozen mood conditions, and so any impairments in information processing that arose directly from the mood would have been constant across both conditions, whereas we found that behavior was quite crucially different between them. Hence it seems implausible to attempt to explain our findings in terms of the direct effects of mood on information processing.

A third approach suggested that motivation, rather than capacity, was affected by emotional distress. In one version of this theory, emotional distress made people cease to care about pursuing positive goals (e.g., earning money in the fishing game in Experiment 2 or performing well on the upcoming test in Experiment 3). Again, though, the mood-freezing manipulation would not have remedied this putative apathy, especially because it was not based on any actual effects. If feeling bad made people cease to care about pursuing positive outcomes, then telling them that their moods were fixed should probably have made little difference (and might indeed have made the apathy worse). Yet the mood-freezing manipulation eliminated the change in self-control. The results are thus directly contrary to the view that emotional distress causes people to stop caring about normal regulatory goals.

A variation on the motivational explanation was that emotional distress would make people want to rebel against their normal goal pursuits and therefore abandon self-regulation. Yet people did not abandon their normal self-regulatory goals when the alternative activities were unappealing (Experiment 3) or when their moods were frozen (all three studies). Hence this theory also was contradicted.

Another variation was that mood would affect self-efficacy, with bad moods producing a drop in confidence that one could successfully achieve the distal outcome. The procrastination study is especially relevant to confidence of success, insofar as the procedure revolved around an anticipated test of intellectual (quan-

titative) ability. Again, though, any direct effect of bad mood on self-efficacy should have occurred regardless of the mood-freezing manipulation because the mood was the same in both conditions. Hence this self-efficacy explanation also has difficulty accounting for the observed results. Apparently the subjective belief about whether the mood was changeable played a decisive role in dictating behavioral choices.

Thus, we did not find any signs that emotional distress impaired the capacity or the motivation to regulate oneself, nor that it generated any motivation to bring suffering and misfortune on oneself. Instead, it appeared that people abandoned some forms of self-regulation only when doing so promised to make them feel better. More precisely, emotional distress interfered with self-regulation only when people believed their moods were changeable—that is, when they perceived that abandoning impulse control in a particular sphere would allow them to reap rewards or pleasures that would be able to reduce their distress and produce a more positive emotional state.

The conclusion, therefore, is that emotionally distraught people indulge their impulses because they hope that indulgence will bring pleasure that may repair their mood and dispel their distress. Impulse control is sometimes at odds with affect regulation, and acute bad moods seem to shift the balance in favor of the short-term pursuit of pleasure instead of the self-denial required to pursue long-term goals. One may still make moral judgments about the abandonment of impulse control under distress, but from a purely pragmatic standpoint, it does appear to have a strategic rationality behind it.

Interpretative Issues

We noted in the *Discussion* section of Experiment 1 that the mood-freezing manipulation in that study may have called attention to mood and behavior (eating) in a way that differed from what the control participants heard. The possibility of differential attention to mood and to eating could have confounded the results and potentially raises alternative explanations. Experiments 2 and 3 fortunately did not suffer from that attentional confound, and so any alternative explanations based on it can be ruled out.

Another issue concerns the actual versus anticipated success of affect regulation. Our results indicate that people engaged in various behaviors only when these behaviors held some promise of being able to improve their moods, but we found precious little evidence that moods actually improved. The mood postmeasure in Study 1 found no sign of final mood differences between the frozen mood and changeable mood conditions, nor did amount of food consumed correlate with subsequent mood. The mood postmeasure in Study 2 did find a correlation between delay of gratification and final mood, but it was ambiguous: It might confirm that immediate gratification led to a better mood, but it might also reflect a sense of lost opportunity due to the way the procedure terminated. In any case, there was no apparent difference in final mood between the frozen mood and changeable mood conditions. Thus, we cannot assert that there was selective pursuit of affect regulation that was differentially successful.

The lack of evidence of mood change can be interpreted three ways. First, because these nonsignificant results are null-hypothesis findings, they can be regarded as relatively meaningless patterns that may indicate insensitive measurement instruments or

other problems. This seems unlikely to us because we did obtain other significant differences on the mood measure in these studies, and moreover the Brief Mood Introspection Scale has been used successfully in many studies. Second, they might indicate that the pleasure of these impulsive activities is fleeting and indeed dissipates as soon as the activity ends. People may have felt better while eating cookies, playing video games, or reading magazines, but as soon as they stopped indulging in these activities, their mood reverted to what it had been, and so by the time we administered the mood measure, the emotional boost from the activity was gone. This is a plausible explanation that would be very well in keeping with our general reasoning: People indulge in impulsive acts during emotional distress because they expect and obtain a temporary pleasure from them. Perhaps they do not even expect any lasting improvement in mood; temporary escape would be appealing enough.

A third possibility is that people are mistaken in their expectations that impulsive activities will make them feel better. In that case, it may be appropriate to describe the response pattern as misregulation rather than underregulation (see Baumeister et al., 1994; Carver & Scheier, 1981) because people are actively trying to change their moods, but they select methods that are ineffective. This interpretation would potentially have the greatest theoretical impact because it would mean that people routinely and with minimal encouragement resort to affect regulation techniques that fail to work.

Past research has suggested that a combination of the second and third of these interpretations is most plausible: Specifically, people may indulge in impulsive activities expecting a lasting mood improvement but getting only a temporary pleasure. Thayer (1987, 1996; Thayer et al., 1994) investigated how people respond to feeling low energy when under stress, and one common response is to eat chocolate or other sugar-rich foods. In his studies, people expressed the belief that these snacks would give them a lasting boost in energy, but in fact people obtained only a brief boost. In the present studies, it stretches plausibility to propose that participants received no pleasure at all from eating snack foods or playing an enjoyable game, but these benefits appear to have subsided by the time we got around to administering the mood measure. Thus, people may be correct in anticipating that impulsive indulgences will bring them pleasure and thus relieve a bad mood, but they may be mistaken in expecting that this improvement in mood will outlast the indulgence.

Concluding Remarks

The results of these three studies suggest that the link between emotional distress and breakdowns in impulse control depends on a strategic, even purposive, shift in priorities. Many programs of impulse control involve denying oneself certain pleasures. When people experience emotional distress, they may believe that indulging in these pleasures will help them feel better. The immediate desire for affect regulation thus comes into conflict with other forms of self-regulation. In plainer terms, people are torn between self-indulgent affect regulation and the self-denial required by the self's other (long-term) goals. The present results suggest that such conflicts are often resolved by giving priority to the goal of affect regulation. People seek to feel better immediately, and to accomplish that, they yield to temptations even when

doing so may be contrary to their long-term best interests and self-regulatory goals.

Another way of describing this conclusion is to say that affect regulation overrides impulse control, at least in the context of emotional distress. Not all forms of affect regulation have this effect, but the relief of acute distress seems to create the most urgent desire for affect regulation, and apparently people are willing to suspend at least some of their normal impulse controls to achieve the escape from bad moods—even an escape that turns out to be quite temporary (although people may believe it will last longer).

The procedures that we used probably underestimated the potential harm and damage that can be caused, in part because practical and ethical constraints limit how much a laboratory study can cause people to harm themselves. People battling with drug and alcohol addiction, for example, may find that a single afternoon's emotional distress can lead to an indulgence that could sweep away months of effort to achieve sobriety. Likewise, a gambling or spending spree may help erase a bad mood while creating far greater problems in its wake, such as lasting debt. Because the long-term costs of abandoning control can far outweigh and outlast the short-term gain in affect, this pattern may well constitute a legitimate and powerful instance of self-defeating behavior.

The tendency to seek to feel better by indulging in forbidden pleasures may be one common response to emotional distress. If so, its contribution to the many failures of impulse control that pervade modern life may be substantial. Some people may end up paying a very high price for a better mood.

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