

Walking the Tightrope Between Feeling Good and Being Accurate: Mood as a Resource in Processing Persuasive Messages

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Three studies investigated the influence of mood states on the processing of positive and negative information regarding caffeine consumption and on the impact of this information on one's mood, attitudes, and intentions. The results were consistent with the predictions of the mood-as-a-resource hypothesis: First, the induction of positive mood in high (compared with low) caffeine consumers enhanced recall of negative information about caffeine consumption. Second, processing information about caffeine consumption undermined the positive mood of high (but not low) caffeine consumers. Third, the induction of positive mood enhanced the impact of negative information about caffeine on high (compared with low) caffeine consumers' attitudes and intentions toward caffeine consumption.

How does mood influence the way people process information about their personality, competence, or health? How do people use such information when they are in a good or bad mood? Past research has demonstrated that when people are processing information, mood may serve as a goal (e.g., Wegener & Petty, 1994; Zillman & Bryant, 1985) and as information (Bless, Bohner, Schwarz, & Strack, 1990; Schwarz, Bless, & Bohner, 1991). When mood serves as a goal, people tend to ignore negative information and seek positive information in a bid to eliminate a negative mood or maintain a positive mood. As information, negative moods, which signal that something is wrong or amiss, motivate individuals to process information more elaborately, whereas positive moods, which signal that everything is all right, decrease the motivation to elaborate on information-processing tasks. The present research investigates a different function of mood; namely, its use as a resource in the processing of self-relevant information. The question is whether and under what conditions positive mood facilitates processing and use of both positive and negative self-relevant information.

To address this question, we distinguish between the potential costs and benefits of self-relevant information. On the one hand, such information may help individuals assess themselves and guide their future decisions and self-improvement efforts (Dunning, 1995; Taylor, Wayment, & Carrillo, 1996; Trope, 1975, 1986; Trope & Neter, 1994). On the other hand, self-relevant information may uncover individuals' liabilities and, thus, threaten their self-esteem and sense of adequacy (Brown, 1990; Crocker & Major, 1989; Dunning, 1995; Pyszczynski & Greenberg, 1987; Steele, 1988; Tesser, 1988; Tesser, Martin, & Cornell, 1996). For

example, the results of a medical check-up may help individuals assess and improve their health, but the feedback may also generate anxiety, guilt, and dejection. When such results are made available, individuals face a self-control dilemma: They may want to attain the long-term assessment benefits of negative information but may be deterred by its immediate emotional costs (Aspinwall, 1998; Gollwitzer, 1990; Kuhl, 1984; Lazarus & Folkman, 1984; Lowenstein & Thaler, 1989; Metcalfe & Mischel, 1999; Mischel, 1974, 1984; Schelling, 1984; Trope & Fishbach, 2000).

The mood-as-a-resource hypothesis proposes that mood may determine how this self-control dilemma is resolved (Aspinwall, 1998; Trope & Neter, 1994). According to this hypothesis, positive mood may act as a buffer against the affective costs of negative information, enabling individuals to focus on the knowledge they can gain from the information. As a result, the weight of long-term information gains relative to the weight of immediate affective costs of information should be greater when people are in a positive mood rather than in a negative mood. The mood-as-a-resource hypothesis predicts, then, that positive mood should facilitate elaborate processing of negative self-relevant information. In a negative mood state, individuals lack the resources needed for coping with the affective costs of negative information. Avoiding short-term affective costs of such information and improving one's mood rather than attaining long-term informational benefits may become the primary goals (see Clark & Isen, 1982; Isen & Simmonds, 1978; Morris & Reilly, 1987; Wegener & Petty, 1994). Thus, when individuals are in a negative mood state, negative self-relevant information is likely to be superficially processed.

Evidence from past research, however, suggests that individuals in a positive mood may generally be more concerned about protecting their mood state (e.g., Isen, 1984; Mischel, Coates, & Raskoff, 1968; Mischel, Ebbesen, & Zeiss, 1973; Wegener & Petty, 1994), which leads them to focus on mood-congruent, positively valenced information. Other researchers have proposed that mood may serve as information regarding one's standing with the environment, which leads to less elaborative processing under positive mood (e.g., Bless et al., 1990; see Schwarz, 1990).

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In this article, we explore conditions under which mood acts as (a) a resource, (b) a goal, or (c) information. The central idea is that positive mood serves as a resource when information is diagnostic of an important aspect relating to the self. That is, individuals in positive moods elaborate more on negative but self-relevant information compared with those in a negative mood. Positive mood acts as a goal when information is diagnostic and important but the individual processing the information is in a negative (vs. positive) mood. When information is of low diagnostic value or when it pertains to an unimportant self-attribute, positive and negative moods act as information; that is, individuals in a positive (vs. negative) mood process such information more superficially.

Mood Management and Informational Value of Moods

A pervasive motivational shift observed under positive and negative affective states is one of maintaining the positive state (e.g., Isen & Simmonds, 1978) and repairing the negative state (e.g., Manucia, Baumann, & Cialdini, 1984; Morris & Reilly, 1987). Participants undergoing premenstrual stress in a Zillman (1988) study, for example, favored watching comedy programs on TV. Similarly, the increased tendency to help, observed under both positive and negative mood states, is presumably due to the good feelings that result from such behavior (Manucia et al., 1984; Schaller & Cialdini, 1990). Studies have found support for mood management in the context of information processing as well. For example, Wegener & Petty (1994) found that participants in a positive mood elaborated on information only when they were assured that doing so would have salutary effects on their affective state. Participants in a negative mood, on the other hand, were less circumspect. Other studies on the effects of mood on information processing (e.g., Isen, 1984; Wegener, Petty, & Smith, 1995) have documented evidence consistent with the thesis that participants in positive moods process information more superficially, presumably because doing so increases the chance that their mood will be preserved.

Positive and negative states may also motivate different types of behavior by conveying different types of information to the individual experiencing the mood state (e.g., Frijda, 1986; Lazarus, 1991; Schwarz, 1990). Negative moods, by signaling that something is amiss, may prompt the individual to survey the environment carefully in a bid to better understand and control it. A positive mood, on the other hand, by conveying that everything is okay, may lead one to pay superficial attention to the environment. In the context of information processing, this suggests that participants in a negative (vs. positive) mood should engage in greater and more systematic elaboration. Indeed, evidence from several studies supports this conjecture (Bless et al., 1990; Bodenhausen, 1993; Clore, Schwarz, & Conway, 1994; Martin, Ward, Achee, & Wyer, 1993; see Schwarz & Clore, 1996 for a review). For example, Bless et al. (1990) presented participants who were in either positive or negative moods with either strong or weak persuasive messages. They found that participants in positive moods were equally persuaded by weak and strong messages, whereas participants in negative moods were persuaded more by strong rather than weak messages. Similarly, Martin et al. (1993) found that, when the goal was to form an accurate impression of a target person, participants in negative (vs. positive) moods tended to elaborate more on information about the target.

In both the mood management and the feelings-as-information studies, self-relevance of the information-processing task has not been explicitly manipulated or measured. Hence, it is unclear whether and how self-relevance of the task may moderate the effects of mood on degree of elaboration. Below, we present a different view of the influence of mood on information processing—a view that explicitly incorporates the role of self-relevance of the information-processing task.

Mood as a Resource

According to the mood-as-a-resource hypothesis, positive mood enhances people's ability to act according to their long-term goals rather than according to competing short-term outcomes (see Trope, Ferguson, & Raghunathan, 2000; Trope & Fishbach, 2000; Trope & Neter, 1994). Self-relevant information is sometimes associated with short-term emotional costs but long-term informational benefits. The processing of such information may temporarily threaten people's self-esteem, but in the long term it may help them improve themselves and make better choices. Positive mood presumably facilitates elaborate processing of such emotionally aversive but potentially useful information. The term *resource* is used here to convey the sense that a positive mood provides the psychological buffer necessary to cope with self-relevant negative information—that is, when people are in a positive mood, they feel more confident of coping with the negative emotional impact of negative information. A useful analogy is to view positive mood as currency. Just as a rich (vs. poor) person is better able to process information about a very expensive product he or she desires, a person who is rich in positive mood may feel less intimidated at the prospect of processing negative self-relevant information.

Recent research on self-evaluation (e.g., Trope & Neter, 1994; Trope & Pomerantz, 1998) provides evidence consistent with our view. Trope and Neter (Study 2) induced positive or negative mood by instructing participants to recall either positive or negative experiences from their past. In a second, ostensibly unrelated part of the study, participants were given feedback from a social sensitivity test that they had taken in an earlier session. Participants received positive feedback about some of the subscales of the test and negative feedback about the other subscales and were then asked to indicate their interest in hearing more detailed and comprehensive feedback about each subscale. As predicted, control and negative mood participants were more interested in positive (vs. negative) feedback about their social sensitivity. In contrast, positive mood participants were more interested in negative (vs. positive) feedback.

The hypothesis that mood serves as a resource implies that the effects of mood on information seeking and processing should depend on the self-relevance of the offered information—namely, the extent to which the information has important personal implications. When the information is highly self-relevant, individuals use their positive mood to overcome the emotional costs of processing the information and, thus, attain its long-term benefits. Positive mood then facilitates (a) search, (b) elaboration, and (c) revision of prior beliefs and intentions in light of negative self-relevant information. Moreover, the mood-as-a-resource hypothesis predicts that individuals' positive mood should be undermined after they process self-relevant information. Specifically, if positive mood promotes elaborate processing of negative information,

then exposure to self-relevant information should undermine individuals' initial positive mood. After an individual processes self-relevant information, his or her mood should be less positive than before he or she processed this information. The use of mood as a resource thus entails an exchange of positive mood for information gain, as a potential gain in self-knowledge may come at the expense of positive mood.

Individuals in a negative mood, in contrast, lack the resources needed to cope with negative information; that is, a negative mood decreases the confidence to deal with the harmful emotional impact of negative self-relevant information. For these individuals, improving the mood state (e.g., Clark & Isen, 1982; Isen & Simmonds, 1978; Morris & Reilly, 1987; Wegener & Petty, 1994) rather than attaining long-term benefits through processing negative information may assume greater priority. Thus, when individuals are in a negative mood state, negative information is likely to be superficially processed. Moreover, when individuals are in such a state, processing the information is unlikely to undermine their mood or change their prior beliefs.

When the offered information is not particularly self-relevant, neither the goal of attaining long-term benefits nor the goal of improving one's mood state is possible. Under these circumstances, positive and negative moods may act as information, as suggested by affect-as-information theories (see Bless et al. 1990; Schwarz, 1990; Schwarz & Clore 1983, 1988, 1996). That is, individuals may rely on their positive mood as indicative of their general well being, thus reducing the need for elaborate processing of any new information. Similarly, negative moods, being indicative of problematic situations, may encourage more elaborate processing of information (see Bless et al., 1990; Bodenhasuen, 1993; Clore et al., 1994; Martin et al., 1993).

The Present Research

Three studies investigated how mood influences the processing of high (vs. low) self-relevant information and the impact of this information on mood, attitudes, and intentions. Participants were presented with an essay containing information regarding the potential health benefits and risks of caffeine consumption. We assumed that this information is of higher self-relevance to participants who are heavy consumers of caffeine than to participants who are light consumers of caffeine (see Liberman & Chaiken, 1992). The studies assessed participants' recall of the information contained in the essay and the impact of this information on participants' mood and beliefs. On the basis of the mood-as-a-resource hypothesis, we predicted that the induction of positive mood in high (vs. low) caffeine consumers would facilitate elaboration and, hence, recall of negative information regarding caffeine consumption and enhance the impact of this information on participants' mood, attitudes, and intentions toward caffeine consumption.

Experiment 1: Mood and Processing Valenced Information

This experiment tests the hypothesis that positive (vs. negative) mood enhances recall of negatively valenced self-relevant information. It was predicted that the induction of positive (vs. negative) mood in high (vs. low) caffeine consumers would improve

their recall of information regarding the health risks associated with caffeine consumption.

Method

Participants

Participants were 69 undergraduate New York University students (33 men and 36 women) who took part in the study to receive course credit. They were randomly assigned to one of two mood conditions: positive or negative.

Procedure

Mood induction. The mood induction procedure was adapted from the one used in the Trope and Neter (1994) study. The experimenter handed out a questionnaire titled "Lateral Thinking Ability Test" (LTAT), in which participants were told that people with greater lateral thinking ability tended to be better managers and that they generally tended to achieve greater success in life. Participants were given 5 min to answer six multiple-choice questions. Following completion of the test, the experimenter collected the answers and exited the room, presumably to grade them. Meanwhile, participants performed an unrelated filler task. On completion of the filler task, the experimenter provided participants with private written feedback on the LTAT. Those assigned to the positive mood condition were told that they had answered five of the six questions correctly and that they were in the top 10% of the class. Those in the negative mood condition were told that they had answered only two questions correctly and that they were in the bottom 30%.

Self-report of caffeine consumption. Following the mood manipulation, participants were asked to take part in a purportedly unrelated study on caffeine consumption. Participants were given a four-item questionnaire that elicited their per-day consumption of coffee, tea, and caffeine-containing soda and their subjective assessment of how heavy their caffeine consumption was. Participants indicated their consumption of coffee, tea, and soda by circling the appropriate number of cups/cans of each (ranging from 0 to >10) that they consumed per day. The subjective assessment of caffeine consumption was provided on a 9-point scale (1 = very low, 9 = very high). The average score on these four items (after the ratings were standardized; $\alpha = .64$) was used to group participants into two (high and low caffeine consumption) groups, according to a median split on level of caffeine consumption. We decided to use both measures because some participants may not admit to being high caffeine consumers even though they objectively are. For such participants (if any), the caffeine consumption essay would nevertheless be relevant, and we wished to capture this.¹ We presumed that participants who were high (vs. low) in caffeine consumption would find information on the effects of caffeine consumption (discussed next) more self-relevant.

Essay on caffeine consumption. The essay on caffeine consumption, adapted from the Liberman and Chaiken (1992) study, consisted of approximately 500 words and was structured into six paragraphs. The first paragraph contained five neutral pieces of information and was followed by five paragraphs that each consisted of one positive and one negative piece of information, making five positive, five neutral, and five negative pieces in all. We conducted a pretest ($n = 10$) to determine the overall positivity/negativity of the valenced statements in the essay and to ascertain whether any of the positive statements were perceived to contradict any of the other positive or negative statements. Two separate 5-point scales (1 = not at all positive [negative] to 5 = extremely positive

¹ Analyses using just the subjective perceptions provide essentially the same results as does an analysis using a combination of both the subjective and the objective measures.

[negative]) were used to measure the positivity and negativity of the five positive and five negative statements, respectively. Participants then considered each statement juxtaposed with every other statement in the essay and reported whether the statements contradicted each other. Results showed that the overall positivity of the five positive statements in the essay ($M = 3.24$, $SD = 1.71$) was statistically equal to the overall negativity of the five negative statements ($M = 3.50$, $SD = 1.28$), $t(9) < 1.00$. Further, none of the statements in the essay was perceived to contradict any other statement. To lend credibility to the essay, we told participants that they were reading excerpts from an article that had recently appeared in the *New England Journal of Medicine*.

Recall of essay content. After reading the essay, participants evaluated it on a four-item Likert scale consisting of items such as "I think the essay was well written." These questions served as a distraction before the recall task. In the recall task, participants were asked to recount the pieces of information that they could remember from the essay. The number of correctly recalled positive, negative, and neutral items served as the dependent variable.

Results and Discussion

Preliminary analyses showed that gender did not affect results. Therefore, this variable was dropped from all subsequent analyses. Two coders who were unaware of the hypotheses and experimental conditions categorized the correctly recalled information into three categories: positive, negative, and neutral items. Intercoder reliability was 98%, and differences were resolved through discussion. A Mood (positive vs. negative) \times Self-Relevance (high vs. low) \times Valence of Items (positive vs. negative) mixed analysis of variance (ANOVA) was conducted on the number of positive and negative items recalled (see Figure 1). The ANOVA showed a main effect of self-relevance, $F(1, 56) = 6.06$, $p < .05$, indicating that high caffeine consumers recalled more items from the essay ($M = 6.00$, $SD = 2.54$) than did low caffeine consumers ($M = 4.51$, $SD = 2.19$). This finding is consistent with our assumption that the essay had greater self-relevance for high caffeine consumers than for low caffeine consumers.

Consistent with the mood-as-a-resource hypothesis, the ANOVA also revealed a Mood \times Valence of Items interaction, $F(1, 56) = 5.14$, $p < .05$, indicating that positive mood participants showed better recall for negative items ($M = 2.74$, $SD = 1.98$) than for positive items ($M = 2.23$, $SD = 1.50$), whereas negative mood participants showed better recall for positive items ($M = 3.07$, $SD = 1.33$) than for negative items ($M = 2.47$, $SD = 1.34$). Moreover, this result was qualified by a marginally significant Mood \times Self-Relevance \times Valence of Items interaction, $F(1, 56) = 2.99$, $p = .09$. As predicted, only for high caffeine consumers was there a Mood \times Valence interaction, $F(1, 27) = 8.47$, $p < .01$, indicating a recall advantage of negative items over positive items under positive mood ($M_s = 3.53$ and 2.67 , $SD_s = 2.03$ and 1.44 , respectively), $t(14) = 2.15$, $p < .06$, and a recall advantage of positive items over negative items under negative mood ($M_s = 3.43$ and 2.36 , $SD_s = 1.45$ and 1.22 , respectively), $t(13) = 2.03$, $p = .06$. Although we did not explicitly predict a difference in the recall between negative and positive items among positive mood participants, the pattern of results is still consistent with our proposition that a positive mood helps cope with negative information.

The recall of positive versus negative items by low caffeine consumers was unaffected by their mood, $F < 1.00$. However, unlike high caffeine consumers, low caffeine consumers showed a

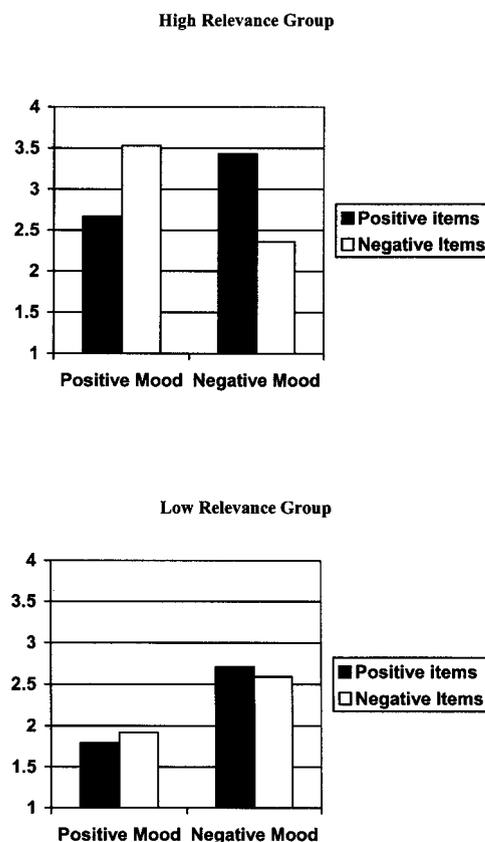


Figure 1. Study 1: Mean recall of positive and negative items in high and low relevance groups.

better overall recall of items, negative and positive, when they were in a negative mood state ($M = 5.29$, $SD = 2.64$) than when they were in a positive mood state ($M = 3.71$, $SD = 2.80$), $F(1, 29) = 4.47$, $p < .05$.

Overall, these findings are consistent with the mood-as-a-resource hypothesis. This hypothesis predicts that positive mood will facilitate processing of negatively valenced information, particularly when this information has high self-relevance. Consistent with this prediction, the induction of a positive (vs. negative) mood state in high caffeine consumers enhanced their recall of the health risks associated with caffeine consumption.

The induction of a negative mood state in high caffeine consumers reduced their recall of the health risks of caffeine consumption. Negative mood presumably depleted the resources needed to cope with the information regarding the health risks of caffeine consumption, leading high caffeine consumers to focus on the health benefits of caffeine consumption, perhaps in an attempt to improve their mood (see Clark & Isen, 1982; Isen & Simmonds, 1978; Manucia et al., 1984; Morris & Reilly, 1987; Wegener & Petty, 1994).

The mood states of low caffeine consumers did not bias their recall in favor of positive or negative information regarding caffeine consumption. Instead, negative mood tended to enhance these participants' overall recall of the content of the essay. This finding is consistent with the mood-as-information hypothesis that

negative mood induces elaborate information processing (Schwarz, 1990; Schwarz & Clore, 1996).

A potential limitation of the present study has to do with our manipulation of mood by providing participants with false performance feedback. This manipulation suffers from the drawback that it alters perceptions of self-efficacy as well (cf. Hill & Ward, 1989). One could therefore argue that the effects obtained in Experiment 1 were driven by self-efficacy perceptions rather than by the mood states. A further limitation of Experiment 1 is that it only provides indirect support for the mood-as-a-resource hypothesis. Specifically, because of a lack of mood measurements, Experiment 1 provides no process evidence for the exchange of positive mood for new information or evidence for an improvement in mood after participants selectively paid attention to positive information. These issues are addressed in Experiment 2.

Experiment 2: Exchanging Positive Mood for New Information

The purpose of this experiment was twofold: (a) to replicate and extend the recall findings of Experiment 1 through a different, purer mood manipulation, and (b) to directly examine the process of exchanging positive mood for negative information. In line with the first objective, we manipulated mood by soliciting autobiographical memory for sad and happy events. Although recalling emotion-inducing episodes from memory may affect one's perceptions of self-efficacy, the likelihood of this happening is lower than with the false feedback manipulation used in Experiment 1. Toward meeting the second objective, we asked for two self-reports of mood states: one immediately following the mood induction, and one immediately after participants had read the essay regarding caffeine consumption. If positive mood is exchanged for information gain, then positive mood should be undermined after participants read a highly self-relevant essay, and the undermining of positive mood should be mediated by elaborate processing of the negative information in the essay.

Method

Participants

Participants were 129 undergraduate New York University students (51 men and 78 women) who took part in the study to receive course credit. They were randomly assigned to one of two affect conditions: positive and negative.

Procedure

Except for the induction and measurement of mood, the procedure of this experiment was identical to that of Experiment 1. As before, self-relevance (of the caffeine consumption essay) was operationalized through a median split of the standardized average score of per-day consumption of coffee, tea, and soda and perception of caffeine usage ($\alpha = .62$).

Mood induction. Positive or negative mood was induced under the guise of an autobiographical memory study, in which we were purportedly interested in finding out what kinds of events make people happy or sad. We induced mood by asking participants to recall three recent happy or sad events (depending on condition) from memory. Such a procedure has been established as a valid means of inducing these mood states (e.g., Isen & Gorgione, 1983; Schwarz & Clore 1983; Trope & Neter, 1994).

Mood measurement. The mood measure was adapted from the Mood Adjective Check List developed by Nowlis (1965) in terms of the instructions. The adjective checklist consisted of eight items, with four items measuring the manipulated moods. The items measuring positive mood were "happy" and "elated," whereas the items measuring negative mood were "sad" and "depressed." Participants indicated the extent to which each affective term described their immediate mood on the checklist, which corresponded to a 4-point scale (0 = *definitely does not apply to my feelings at this moment*, 3 = *definitely does apply to my feelings at this moment*). This measure was administered twice, immediately after the mood induction and immediately after the recall task.

Results

Gender did not affect the results and was therefore dropped from the analyses. Two coders who were unaware of the hypotheses and experimental condition categorized the correctly recalled items from the essay into positive, negative, and neutral items. Intercoder reliability was 96%, and differences were sorted out prior to analysis. Two other coders analyzed the content of the three recent happy and sad events recalled by our participants to ensure that the intensity of the recalled experiences did not vary greatly. Two separate 5-point scales were used to rate the intensity of every episode recalled by each participant (1 = *the incident would have made the participant: not at all sad [happy]*, 5 = *the incident would have made the participant: extremely sad [happy]*). We calculated an average across these two items (after reverse coding one of them) as a measure of happiness and sadness intensity for each participant. The coders also rated the extent to which (they believed) each episode enhanced or diminished perceptions of self-efficacy on a 5-point scale (1 = *diminished perceptions of self-efficacy*, 5 = *enhanced perceptions of self-efficacy*). Self-efficacy was defined as the extent to which the reported event could have made the participant feel more capable on any dimension involving personal skill (cf. Hill & Ward, 1989).

Manipulation Checks

Intensity of happiness ($M = 3.37$, $SD = 5.01$) and sadness ($M = 3.57$, $SD = 4.81$) did not differ across the two mood conditions, $F(1, 125) = 1.17$, $p > .50$. Further, the extent to which the recalled episodes enhanced or diminished perceptions of self-efficacy was not significantly different across the two positive and negative mood conditions, $F(1, 125) = 2.07$, $p > .15$, although it was somewhat higher in the positive mood group ($M = 3.27$, $SD = 2.25$), compared with the negative mood group ($M = 2.53$, $SD = 2.10$). Finally, among the remaining participants, those asked to recall happy events reported being more happy ($M = 1.71$, $SD = 1.00$) and less sad ($M = 0.46$, $SD = 1.72$), compared with those asked to recall sad events ($M_s = 0.67$ and 1.77 , $SD_s = .95$ and 1.27 , respectively), $F(1, 119) = 54.34$, $p < .001$, and $F(1, 119) = 64.68$, $p < .001$, respectively.

Recall

A Mood (positive vs. negative) \times Self-Relevance (high vs. low) \times Valence of Items (positive vs. negative) analysis of covariance, with perceived self-efficacy as a covariate, was first conducted on the number of positive and negative items recalled. However, self-efficacy perceptions did not have a main effect,

$F < 1.00$, and did not interact with any of the other factors and were thus dropped from further analyses.

The results were similar to those obtained in Experiment 1. Specifically, a main effect of self-relevance, $F(1, 120) = 8.05, p < .01$, indicated that high caffeine consumers recalled more items from the essay ($M = 5.02, SD = 1.66$) than did low caffeine consumers ($M = 3.88, SD = 2.33$). This finding is consistent with our assumption that the essay was more self-relevant to high caffeine consumers than to low caffeine consumers.

Consistent with the mood-as-a-resource hypothesis (see Figure 2), the analysis also revealed a Mood \times Valence interaction, $F(1, 120) = 4.89, p < .05$, indicating better recall of positive than negative information by negative mood participants ($M_s = 2.63$ and $1.96, SD_s = 1.50$ and 1.48 , respectively) but not by positive mood participants ($M_s = 2.13$ and $2.18, SD_s = 1.37$ and 1.27 , respectively). However, this effect was qualified by the Mood \times Self-Relevance \times Valence of Items interaction predicted by the mood-as-a-resource hypothesis, $F(1, 125) = 5.64, p < .05$. Consistent with the results of Experiment 1, a Mood \times Valence interaction for high caffeine consumers, $F(1, 125) = 8.20, p < .01$, indicated that mood affected recall of positive versus negative information only for high caffeine consumers; among high caffeine users, positive information was better recalled than was negative information under negative mood ($M_s = 3.17$ and $1.87, SD_s = 1.26$ and 1.22 , respectively), $F(1, 125) = 3.50, p < .01$, but not under positive mood ($M_s = 2.38$ and $2.62, SD_s = 1.41$ and 1.23 , respectively), $F < 1.00$. For low caffeine consumers,

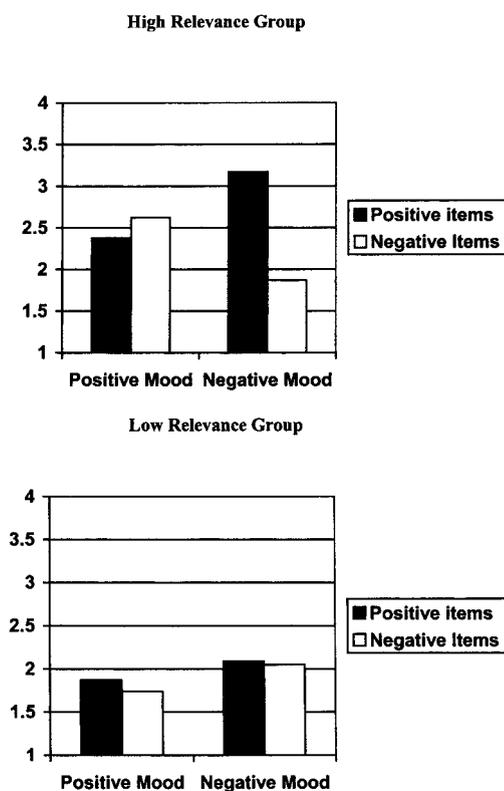


Figure 2. Study 2: Mean recall of positive and negative items in high and low relevance groups.

recall of positive versus negative information was unaffected by mood, $F < 1.00$. As in Experiment 1 and consistent with mood as information (Schwarz, 1990), overall recall by low caffeine users was somewhat higher when they were in a negative mood state ($M = 4.15, SD = 3.00$) than when they were in a positive mood state ($M = 3.61, SD = 1.55$), although this difference was not significant, $F < 1.00$.

Change in Mood

Participants' responses to the mood checklist served to assess their mood before and after they read the essay. We created a positive and negative mood index by averaging scores across the two items for each mood—"happy" and "elated" for positive mood, and "sad" and "depressed" for negative mood.

Mood change was calculated as the difference in positive and negative mood scores between the two mood measurements (see Figure 3). These two mood change scores were treated as a repeated measures factor in a 2 (mood) \times 2 (self-relevance) \times 2 (positive vs. negative mood change scores) mixed ANOVA. The ANOVA yielded a significant Mood \times Change Score interaction, $F(1, 115) = 42.02, p < .001$, indicating that the mood state of those in the positive mood condition became significantly less positive and more negative ($M_s = -0.70$ and $0.30, SD_s = 1.18$ and 0.86 , respectively), $F(1, 115) = 3.82, p < .001$, after they processed the essay, whereas the mood state of those in the negative mood condition became more positive and less negative ($M_s = 0.36$ and $-0.79, SD_s = 0.99$ and 1.38 , respectively), $F(1, 115) = 4.57, p < .001$.

In themselves, these mood change data may be due to the mere passage of time or regression effects. However, these factors cannot account for the predicted Mood \times Mood Change Score \times Self-Relevance interaction, $F(1, 120) = 10.88, p < .01$. Consistent with the mood-as-a-resource hypothesis, this interaction indicates that the processing of the essay had a more pronounced influence on the mood of high caffeine consumers than on the mood of low caffeine consumers. Specifically, after they read the essay, the initial positive or negative moods of high caffeine consumers were diminished to a greater extent than were the moods of low caffeine consumers, as suggested by the significant Mood \times Mood Change Score interaction, $F(1, 115) = 40.01, p < .001$ (see Figure 3). When high caffeine consumers started with a positive mood, they became less happy ($M = -1.13, SD = 1.06$) and more sad ($M = 0.70, SD = 1.00$), $F(1, 115) = 5.11, p < .001$, but when they started with a negative mood, they became more happy ($M = 0.53, SD = 1.03$) and less sad ($M = -0.93, SD = 1.12$), $F(1, 115) = 4.22, p < .001$. The corresponding mood changes among low caffeine consumers were also significant, $F(1, 115) = 6.02, p < .05$, but considerably weaker, as indicated by the significant three-way interaction.

Recall as a Mediator of Mood Change

The results thus far demonstrate that mood and self-relevance jointly affect both the processing of the information contained in the essay (assessed by recall of positive vs. negative items) and changes in mood after reading the essay. The question is whether the processing of the information contained in the essay mediates the joint effect of mood and self-relevance on mood change.

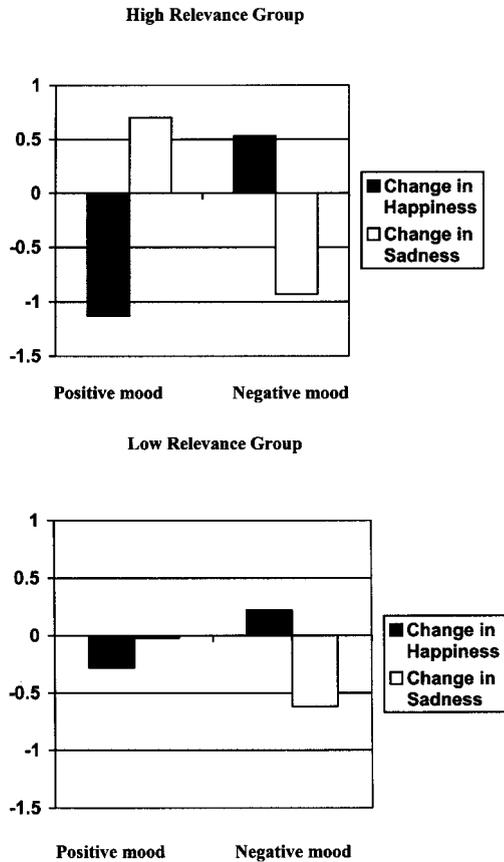


Figure 3. Study 2: Mean change in positive and negative moods in high and low relevance groups.

Theoretically, mood influences the processing of self-relevant positive versus negative items, which, in turn, influences mood changes. To test this mediation hypothesis, we conducted a mediation analysis in accordance with steps outlined by Kenny, Kashy, and Bolger (1998). Initial mood (positive vs. negative) was treated as the predictor variable, and change in positive mood minus change in negative mood was treated as the dependent variable, with recall of positive items minus recall of negative items serving as the mediator. The path diagram in Figure 4 presents the results.

It can be seen that, separately, neither mood nor self-relevance significantly affected mood change through recall. However, in conjunction, mood and self-relevance did affect mood change through recall of positive versus negative items from the essay. Specifically, consistent with the ANOVA on recall, a significant path from Mood \times Self-Relevance to recall ($\beta = -.41, p < .05$) indicated that positive (compared with negative) mood enhanced recall of negative (relative to positive) items for high (but not low) caffeine consumers. Recall of relatively more negative items, in turn, predicted a greater change toward a less positive mood after participants read the essay, as indicated by the path from recall to mood change ($\beta = -.28, p < .001$). When we controlled for recall of positive versus negative items, the mediated Mood \times Self-Relevance effect on mood change remained significant ($\beta = -.45, p < .01$) but lower than the unmediated Mood \times Self-Relevance effect on mood change ($\beta = -.58, p < .005$). A modified Sobel (1982) test, used to check for difference in significance between the mediated and unmediated effects (cf. Kenny et al., 1998), revealed that the difference was marginally significant ($Z = 1.82, p < .07$). This suggests, consistent with our theory, that the conjunctive effect of mood and self-relevance on mood change

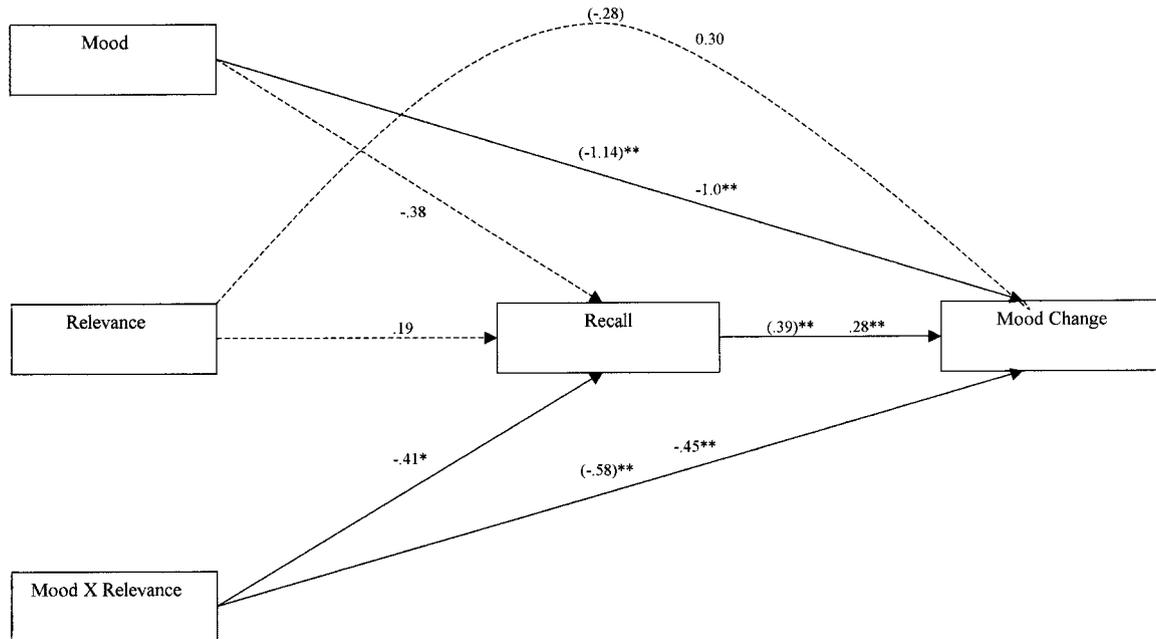


Figure 4. Study 2: Path diagram of mood change as a function of mood and relevance mediated by recall of items from the essay. Values in parentheses are unmediated effects; values without parentheses are mediated effects. * $p < .05$. ** $p < .01$.

was partially mediated by recall of positive versus negative items from the essay.

Discussion

Several aspects of the present results are noteworthy. First, the recall data replicate Experiment 1's finding that positive (vs. negative) mood enhanced processing of negative information regarding caffeine consumption when this information had high rather than low self-relevance.² Second, we obtained these results using a different mood manipulation (autobiographical memory vs. false performance feedback) that allowed us to control for self-efficacy perceptions, thus ruling out self-efficacy interpretations and establishing the generality of the results. Third, the mood change data show that processing the essay about caffeine undermined participants' positive mood when this essay was personally relevant. This is consistent with the idea that positive mood served as a resource, enabling participants to acquire useful but emotionally unpleasant information, rather than as a goal in itself. Finally, the finding that processing the self-relevant essay had a positive affective impact on participants who were initially in a negative mood suggests that these participants used the essay to improve their mood.

The mediation analysis provides additional evidence regarding the mechanism underlying the use of mood as a resource and as a goal. The results of this analysis show that the induction of a positive mood promoted elaborate processing of both negative and positive items from the self-relevant essay but that this balanced processing undermined participants' initial positive mood. In contrast, the induction of a negative mood promoted positively biased processing of the self-relevant essay, which, in turn, helped improve the participants' initial negative mood.

In sum, the recall and mood change data are consistent with the mood-as-a-resource hypothesis that positive (vs. negative) mood facilitates processing of negative self-relevant information about caffeine. However, two additional concerns remain. First, it is unclear from our results whether the difference in processing of positive versus negative information by the positive and negative mood participants was driven mainly by those in the positive mood or by those in the negative mood. Specifically, it is not possible to determine from our data whether positive mood provided the resources needed to counter negative information or whether negative mood provided the drive to focus more on positive information. To better understand the source of our effects, we included a neutral mood group in the next (and final) study.

The second issue concerns the impact, among positive mood participants, of processing the information in the essay. Specifically, we wished to ascertain whether participants in a positive mood would adopt less favorable attitudes and intentions toward caffeine consumption after processing information in the essay. It may be argued that people in a positive mood will downplay the seriousness of the essay or, alternatively, that a positive mood may engender feelings of self-assuredness and, hence, may lead participants to argue against the negative self-relevant information. In either case, the information in the essay should have little impact on positive mood participants' attitudes and intentions. If, on the other hand, positive mood leads to serious processing and integration of the informational content of the essay, we should observe a change in attitudes and behavioral intentions toward caffeine and

caffeine consumption. This issue is also addressed in our next study.

Experiment 3: Mood and Attitude Change

This experiment had two main objectives. First, we wished to demonstrate, in a more convincing fashion, that positive mood enhances the ability to cope with negative but useful self-relevant information. In line with this objective, we included a neutral group in this experiment as a comparison group. Second, we wished to test the hypothesis that positive mood increases the persuasive impact of negatively valenced information when this information has high self-relevance—that is, that positive mood does not lead to frivolous processing or to arguments against negative information. In accordance with this objective, we incorporated two elements in the design of Experiment 3. First, rather than asking participants to accurately recall informational content from the essay (as in the first two experiments), we engaged them in a thought-listing task. The thought listings were used to assess the seriousness with which the essay was processed and the degree to which participants tended to argue against the informational content of the essay. Second, we measured participants' attitude and behavioral intentions toward caffeine consumption before and after they read the essay. The mood-as-a-resource hypothesis predicts that reading the essay regarding caffeine consumption will produce less favorable attitudes toward caffeine consumption and stronger intentions to reduce caffeine consumption to the extent that participants' mood is positive and their level of caffeine consumption is high.

Method

Participants

Participants were 115 undergraduate University of Texas students (47 men and 68 women) who took part in the study to receive course credit. They were randomly assigned to one of three affect conditions: positive, negative, or neutral.

Procedure

The procedure was the same as that of Experiment 2, except for the following: (a) addition of the neutral group, (b) thought listings (rather than recall) were collected, and (c) measurement of attitudes toward caffeine consumption 1 month before the experiment and immediately after reading the essay. We collected the thoughts after eliciting the postessay attitudes and behavioral intentions toward caffeine consumption; that is, the order was as follows: (a) preessay attitudes and behavioral intentions, (b) mood

² It is interesting to note that, although there was a difference in recall of negative versus positive information in the positive mood condition in Experiment 1, this effect was not found in Experiment 2. Recall that, in Experiment 1, our mood manipulation was based on the provision of false feedback. It is possible that this manipulation (compared with the autobiographical memory manipulation used in Experiment 2) affected perceptions of self-efficacy. The combination of increased (lowered) self-efficacy that may have accompanied the positive (negative) mood condition may have played a role in making the positive mood participants in Experiment 1 more capable (compared with just a pure positive mood) of processing negative information.

manipulation and exposure to essay, (c) postessay attitudes toward caffeine consumption, and, finally, (d) thought listings.

The neutral group participants were asked to “recall three recent neutral (neither happy nor sad) incidents.” We elicited participants’ thoughts by asking them to “list any and all thoughts that occurred to you while reading the essay.” We measured attitude toward caffeine consumption using four evaluative questions, which asked participants to indicate how good, bad, beneficial, and detrimental they thought caffeine was, whereas we measured behavioral intention by two other questions, which asked participants to indicate whether they would and should cut down on their caffeine consumption. All questions were answered on 7-point (1 = *strongly agree*, 7 = *strongly disagree*) scales. In the preessay elicitation, the measure was part of a questionnaire that contained other questions pertaining to the participant’s caffeine consumption habits. In the postessay elicitation, the measure was administered after participants had read the caffeine consumption essay. As in the previous experiments, self-relevance was operationalized through a median split on consumption of standardized scores of coffee, tea, and soda consumption and the self-report of subjective perception of caffeine usage ($\alpha = .60$).

Results

As in Experiment 2, two coders independently content analyzed the three recent happy and sad events recalled by our participants to ensure that the intensity of the recalled experiences did not differ significantly. The coders then rated the extent to which the episodes recalled in the happy, neutral, and sad groups affected perceptions of self-efficacy, using the same 5-point scale (1 = *diminished perceptions of self-efficacy*, 5 = *enhanced perceptions of self-efficacy*) used in Experiment 2. Finally, two other coders, who were unaware of the hypotheses and experimental conditions, categorized the thought listings into the following eight mutually nonexclusive categories: positive thoughts, negative thoughts, neutral thoughts, support arguments (statements made in support of a statement that appeared in the essay), counterarguments (statements made against a statement that appeared in the essay), thoughts indicative of seriousness in processing the information (e.g., “I think the essay speaks to an important issue”), thoughts indicative of superficial processing of the essay (e.g., “I couldn’t be bothered less about what the essay says”), and, finally, other (unrelated) thoughts.³ As explained earlier, one may account for our earlier findings by assuming that positive mood helps people downplay the seriousness of negative messages and/or helps people argue against them. To test this interpretation, we used the coding of thoughts to examine whether participants in the positive, neutral, and negative moods differed in the extent to which they trivialized the information in the essay or argued against it. Overall intercoder reliability was 89%, and differences were resolved through discussion.

Manipulation Checks

Intensity of happiness ($M = 3.41$, $SD = 3.01$) and sadness ($M = 3.51$, $SD = 2.53$) did not differ across the two mood conditions, $F < 1.00$. Further, as in Experiment 2, the extent to which the recalled episodes enhanced or diminished perceptions of self-efficacy was not significantly different across the mood conditions, $F(1, 108) = 1.07$, $p > .50$, although it was somewhat higher in the positive mood group ($M = 3.27$, $SD = 1.81$), compared with the negative mood group ($M = 3.01$, $SD = 2.01$).

Thought Listings

As in the previous experiments, gender did not affect the results and was therefore dropped from the analyses. We first conducted a Mood (positive, neutral, negative) \times Self-Relevance (high vs. low) \times Valence of Thoughts (positive vs. negative) \times Self-Efficacy mixed ANOVA, using the last factor as a continuous variable. As in Experiment 2, self-efficacy perceptions had no main effect, $F < 1.00$, and did not interact with any of the other factors, and they were hence dropped from further analyses. A main effect of self-relevance emerged, $F(1, 107) = 66.23$, $p < .001$, indicating that high caffeine consumers listed a greater number of thoughts about the essay ($M = 6.00$, $SD = 1.96$) compared with low caffeine consumers ($M = 2.74$, $SD = 1.32$). This suggests that the former group found the essay more personally relevant compared with the latter group.

As predicted, a significant Mood \times Valence interaction, $F(2, 107) = 7.67$, $p < .01$, indicated a greater number of negative (vs. positive) thoughts by positive mood participants ($M_s = 2.36$ and 1.79 , $SD_s = 1.68$ and 1.22 , respectively) compared with the neutral ($M_s = 1.74$ and 2.13 , $SD_s = 1.47$ and 1.79 , respectively) and negative mood participants ($M_s = 1.74$ and 2.74 , $SD_s = 1.13$ and 1.69 , respectively). The difference in thought was most pronounced among the high self-relevance participants (see Figure 5), as indicated by a significant three-way Mood \times Valence \times Self-Relevance interaction, $F(1, 107) = 7.84$, $p < .001$. As expected, the two-way Mood \times Valence interaction was significant in the high self-relevance condition, $F(2, 107) = 10.06$, $p < .001$, but not in the low self-relevance condition, $F < 1.00$. Follow-up analyses revealed a significant two-way Mood \times Valence interaction between the positive and neutral mood participants, $F(1, 73) = 4.85$, $p < .05$, as well as between the positive and negative mood participants, $F(1, 74) = 18.39$, $p < .001$; among high caffeine users, more negative thoughts, compared with positive thoughts, were listed under positive mood ($M_s = 3.38$ and 2.50 , $SD_s = 1.64$ and 1.25 , respectively), $F(1, 55) = 3.81$, $p = .06$, whereas the trend was reversed among participants in the neutral ($M_s = 2.15$ and 3.25 , $SD_s = 1.53$ and 1.59 , respectively), $F(1, 55) = 6.50$, $p < .05$, and negative mood conditions ($M_s = 3.85$ and 1.60 , $SD_s = 1.23$ and 0.88 , respectively), $F(1, 55) = 21.67$, $p < .001$. In contrast, among low caffeine consumers, the relative difference in number of negative and positive thoughts was not significantly different across the positive ($M_s = 1.33$ and 1.08 , $SD_s = 1.04$ and 0.77 , respectively), neutral ($M_s = 1.33$ and 1.00 , $SD_s = 1.29$ and 1.13 , respectively), and negative ($M = 1.63$ and 1.87 , $SD_s = 1.40$ and 1.36 , respectively) mood conditions, all $F_s < 1.10$. As in Experiments 1 and 2, however, low caffeine consumers tended to list more thoughts overall when in a negative mood ($M = 4.38$, $SD = 2.31$) than when in a neutral ($M = 3.33$,

³ Note that category membership for statements was nonexclusive; that is, statements could go into more than one category. For example, a statement such as “I agree that caffeine can give you the extra bit of stimulation when you need it” was coded as a positive thought as well as a support argument (because a statement to this effect did appear in the caffeine consumption essay). Similarly, a statement such as “I do remember reading somewhere else too that excessive caffeine intake may cause ulcers” was coded as both a negative thought and a support argument.

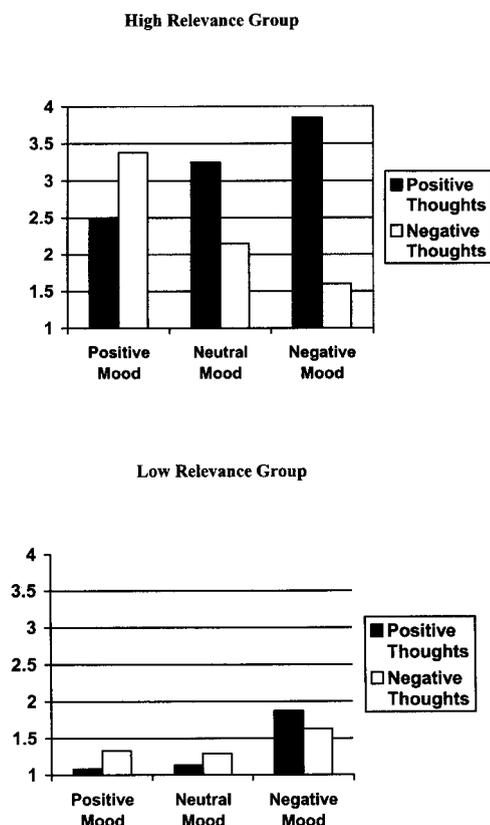


Figure 5. Study 3: Thought listings across high and low relevance groups.

$SD = 2.13$), $F(1, 51) = 1.70$, $p = .20$, or a positive mood ($M = 3.54$, $SD = 2.13$), $F(1, 51) = 1.38$, $p > .20$.

Support Arguments, Counterarguments, and Other Thoughts

It is important to note that the pattern of results obtained in the positive mood condition was not driven by the desire to trivialize negative information or to argue against it. We conducted four separate 3 (mood) \times 2 (self-relevance) ANOVAs using the number of (a) support arguments, (b) counterarguments, (c) thoughts indicating that the essay was taken seriously, and (d) thoughts indicating that the essay was treated frivolously as the dependent variables. Mood was a nonsignificant predictor of all four variables. Specifically, positive mood participants presented as many support arguments to the informational content in the essay ($M = 3.29$, $SD = 4.59$) as did the neutral ($M = 2.98$, $SD = 5.01$) and negative mood participants ($M = 3.77$, $SD = 5.01$), $F < 1.00$. The difference in number of counterarguments among the positive ($M = 1.21$, $SD = 4.10$), neutral ($M = 1.90$, $SD = 3.76$), and negative ($M = 0.98$, $SD = 2.98$) mood participants was similarly nonsignificant, $F < 1.00$. In addition, positive mood participants appeared to process information in the essay with as much seriousness and lack of frivolity (M s = 1.27 and 0.31, SD s = 3.98 and 4.10) as did the participants in the neutral (M s = 1.54 and 0.00, SD s = 3.20 and 2.90) and negative moods (M s = 0.87 and 0.00, SD s = 5.87 and 4.92), all F s < 1.00 .

Attitudes and Behavioral Intentions

For both the preessay and the postessay measures, a principal-components factor analysis on the six items measuring attitude toward caffeine consumption yielded, as expected, two factors. In both cases, the first factor consisted of the four evaluative items (all factor loadings $> .60$), whereas the second factor consisted of the two behavioral intention items (both factor loadings $> .85$). On the basis of these results, we constructed two measures, one evaluative and one behavioral, by summing the scores of the relevant items ($\alpha = .71$ and $.73$ for the pre- and postevaluative measures and $.65$ and $.83$ for the pre- and postbehavioral measures, respectively).

We conducted a Mood (positive vs. negative) \times Self-Relevance (high vs. low) ANOVA on the postessay attitude, using the preessay attitude as a covariate. The preessay attitudes toward caffeine consumption had a nonsignificant effect on the postessay attitudes, $F(1, 107) = 2.03$, $p > .15$. Results (see Figure 6) also revealed a marginally significant Mood \times Self-Relevance interaction effect, $F(2, 107) = 2.30$, $p = .10$. Follow-up analyses unveiled a significant mood effect under the high self-relevance condition, $F(2, 107) = 3.24$, $p < .05$, but not under the low self-relevance condition, $F < 1.00$. Consistent with our predictions, positive mood participants who were high in caffeine consumption reported a more negative postessay attitude ($M = 3.19$, $SD = 1.21$) compared with the corresponding neutral ($M = 4.15$, $SD = 1.47$), $F(1, 107) = 5.49$, $p < .05$, and negative mood participants ($M = 4.28$, $SD = 1.27$), $F(1, 107) = 8.14$, $p < .01$. The difference in postessay attitude between the high self-relevance negative and neutral mood groups was not significant, $F < 1.00$. When the essay had low personal relevance, mood did not affect postessay attitudes, $F < 1.00$ (M s = 3.61, 4.00, and 3.58, and SD s = 0.80, 0.80, and 1.40 for positive, neutral, and negative mood conditions, respectively).

A 2 (mood) \times 2 (self-relevance) ANOVA on the postbehavioral intention score with preessay intentions as a covariate yielded similar results (see Figure 7). The main effect of preessay behavioral intentions was significant, $F(1, 107) = 10.30$, $p < .01$. Further, a marginally significant Mood \times Self-Relevance interaction emerged, $F(2, 107) = 2.89$, $p = .06$, revealing that, consistent with our predictions, although mood had a significant effect in the

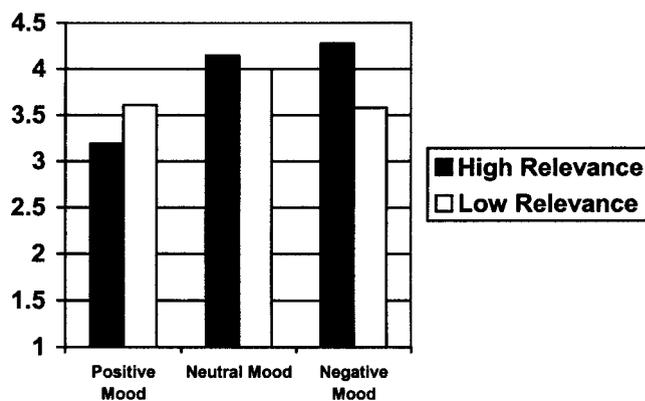


Figure 6. Study 3: Mean change in evaluation scores for caffeine. Higher scores imply more positive change in evaluations of caffeine.

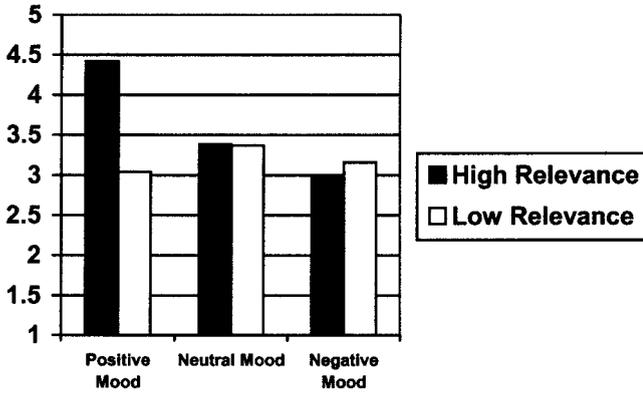


Figure 7. Study 3: Change in behavioral intentions toward caffeine consumption. Higher numbers mean stronger intentions to lower caffeine consumption.

high self-relevance group, $F(2, 107) = 6.04, p < .01$, it did not have an effect in the low self-relevance group, $F < 1.00$. Replicating results with the attitude scores, high caffeine consumers in the positive mood condition expressed stronger intentions to reduce caffeine consumption ($M = 4.42, SD = 1.59$), compared with those in the corresponding negative mood condition ($M = 2.98, SD = 0.87$), $F(1, 107) = 13.00, p < .01$, and neutral mood condition ($M = 3.38, SD = 1.40$), $F(1, 107) = 4.00, p = .05$. The difference in behavioral intentions between high self-relevance negative and neutral mood groups was not significant, $F(1, 107) = 1.19, p > .25$. In contrast, low caffeine consumers showed little difference in their postessay intentions, whether their mood

was positive, neutral, or negative ($M_s = 3.04, 3.37$, and 3.16 , and $SD_s = 1.50, 1.72$, and 2.26 , respectively), $F < 1.00$.

Valence of Thought Listings as a Mediator

The results thus far demonstrate that mood and self-relevance jointly affected both the processing of the information contained in the essay (assessed by listings of positive vs. negative thoughts) and changes in attitudes and behavioral intentions after participants read the essay. We hypothesized that mood influences the processing of self-relevant positive versus negative items and that the resulting change in attitude and behavioral intentions is an outcome of such processing. We conducted a mediation analysis, in accordance with Kenny et al. (1998), to test for this hypothesis. As in Experiment 2, initial mood (positive, negative) was used as the predictor variable. Change in attitude toward caffeine and change in behavioral intentions were used as the dependent variables (in two separate mediation analyses), whereas the number of positive minus the number of negative thoughts served as the mediator in both analyses. We first report results using attitudes toward caffeine as the dependent variable (see Figure 8).

Consistent with the ANOVA results on thought listings, a significant path from $Mood \times Self-Relevance$ to thoughts ($B = -0.74, p < .001$) indicated that positive (vs. negative) mood enhanced listing of negative (vs. positive) thoughts for high (but not low) caffeine consumers. Overall, the greater the relative number of negative thoughts, the greater was the negative change in attitude toward caffeine consumption ($B = -1.53, p < .001$). Further, whereas the unmediated effect of $Mood \times Self-Relevance$ on attitude change was marginally significant ($B = 1.30, p = .05$), the mediated $Mood \times Self-Relevance$ interaction (with valence of

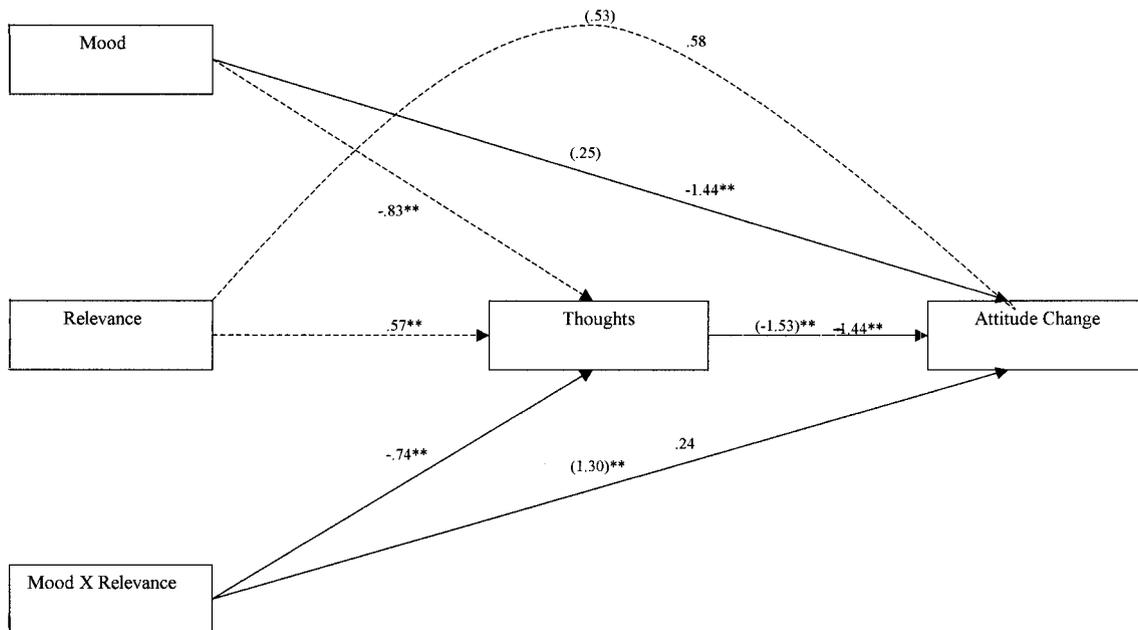


Figure 8. Study 3: Path diagram of attitude change as a function of mood and relevance mediated by valence of thought listings. Values in parentheses are unmediated effects; values without parentheses are mediated effects. ** $p < .01$.

thoughts in the thought listings controlled for) became nonsignificant ($B = 0.24, p > .70$). Modified Sobel (1982) tests, as outlined by Kenny et al. (1998), revealed that the difference between the mediated and unmediated Mood \times Self-Relevance effect was significant, $Z = 3.09, p < .001$, for the change in attitude toward caffeine consumption.

We obtained similar results using change in behavioral intentions as the dependent variable (see Figure 9). First, the greater the number of negative thoughts was, the lower was the intention to give up caffeine consumption ($B = -0.47, p < .01$). Further, whereas the unmediated effect of Mood \times Self-Relevance on behavioral change was marginally significant ($B = 0.64, p = .12$), the mediated effect (with the relative valence of thoughts in the thought listings controlled for) was not significant ($B = 0.34, p > .40$). Once again, the modified Sobel (1982) test revealed that the difference between the mediated and unmediated Mood \times Self-Relevance effect was significant for the change in behavioral intentions toward caffeine consumption ($Z = 2.23, p < .01$).

Discussion

Experiments 1 and 2 demonstrate that positive mood may act as a resource, enabling people to elaborate more on negative but useful information. Further, in Experiment 2, the results show that the short-term affective consequences of such willingness on the part of positive participants to expose themselves to negative information may prove detrimental. The present experiment extends these findings to demonstrate that elaboration on negative but useful information may result in change in attitudes and behavioral intentions. Together, the three studies provide converging support for the mood-as-a-resource hypothesis.

Like the results from the previous experiments, results from this experiment also illustrate the important moderating role played by self-relevance of the information-processing task. Specifically, we find that the induction of a positive mood state resulted in the adoption of less favorable attitudes and intentions toward caffeine consumption than did the induction of a neutral or a negative mood state—but only among participants who were high in caffeine consumption. For low caffeine consumers, the induction of a positive, neutral, or negative mood did not affect the persuasive impact of the essay. These results contradict the possibility that positive mood participants may have been trying to refute or argue against the negative information regarding caffeine consumption or that they treated the information processing task with a lack of seriousness. Further evidence that a positive mood does not result in counterarguing or in lack of seriousness was reflected in the thought listings. Overall, the results are consistent with the mood-as-a-resource hypothesis that positive mood enhances elaborate processing of negative but useful information and integration of this information into one's attitudes and behavioral intentions.

Among the high self-relevance negative mood participants, we once again observe a tendency to focus more on positive information, which suggests the operation of mood repair (Clark & Isen, 1982; Morris & Reilly, 1987). Lastly, consistent with findings from Experiments 1 and 2, we find evidence in support of affect as information in the low self-relevance conditions (Schwarz, 1990; Schwarz & Clore, 1996). Specifically, sad participants who were low in caffeine consumption tended to list more thoughts, overall, compared with the corresponding group of happy or neutral mood participants.

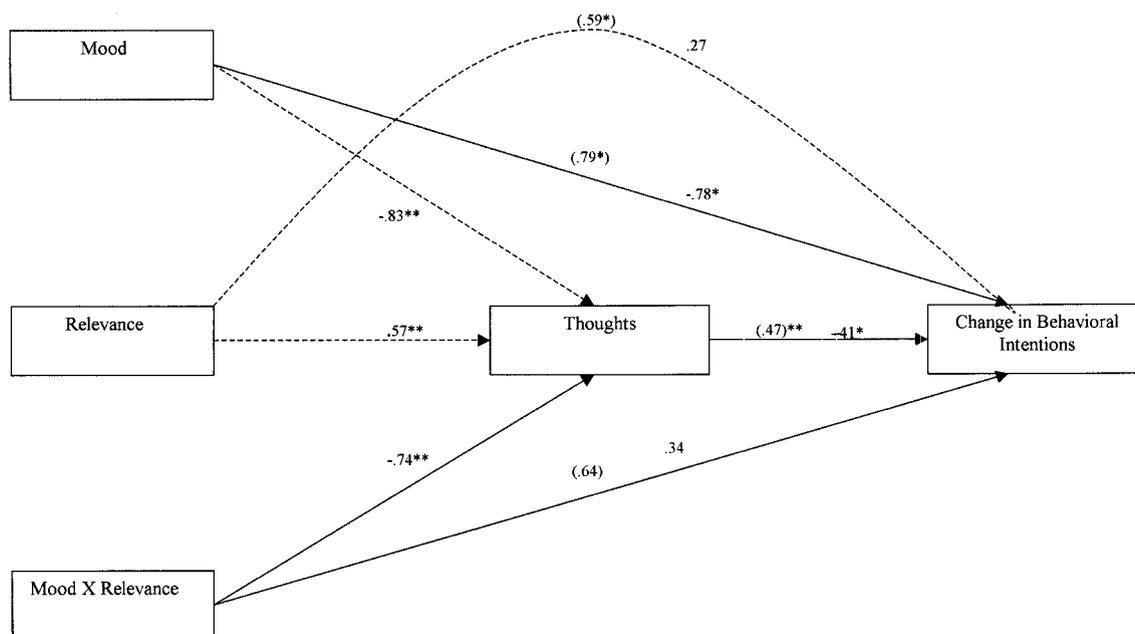


Figure 9. Study 3: Path diagram of change in behavioral intentions as a function of mood and relevance mediated by valence of thought listings. Values in parentheses are unmediated effects; values without parentheses are mediated effects. * $p < .05$. ** $p < .01$.

General Discussion

The aim of the present studies was to investigate the influence of mood states on the processing of positive and negative information regarding caffeine consumption and on the impact of this information on one's mood, attitudes, and intentions. The findings are straightforward: First, the induction of a positive mood in high (compared with low) caffeine consumers enhanced recall of negative information about caffeine consumption. Second, processing information about caffeine consumption undermined the positive mood of high (but not low) caffeine consumers. Third, the induction of positive mood enhanced the impact of negative information about caffeine on high (compared with low) caffeine consumers' attitudes and intentions toward caffeine consumption.

Positive Mood as a Resource

Together, these findings demonstrate the self-regulatory function of positive mood states—namely, their ability to facilitate elaborate processing and revision of prior opinions in light of emotionally aversive but potentially useful information. The mood change data show that processing the information regarding caffeine was indeed emotionally unpleasant when our high caffeine consumers were in a positive mood state. But this did not prevent them from deeply processing this information and integrating it into their beliefs and intentions regarding caffeine consumption. It seems, then, that when potentially useful information is offered, positive mood states can be undermined by the very unbiased information processing strategies they elicit.

The present findings are consistent with the mood-as-a-resource hypothesis. This hypothesis assumes that when self-relevant information is made available, individuals face a motivational dilemma. On the one hand, information about one's weaknesses and vulnerabilities has long-term value for future choice and self-improvement. On the other hand, such information is associated with immediate emotional costs. The mood-as-a-resource hypothesis suggests that mood influences how this conflict is resolved. Specifically, positive mood states may enable people to focus on the long-term value of negative information and better cope with its immediate emotional costs. Therefore, positive mood should enhance search, processing, and integration of negative self-relevant information.

Mood Management

In a negative mood state, people presumably lack the resources needed to cope with negative feedback. In such a state, elaborate processing and integration of negative self-relevant information is too difficult, and improving one's immediate mood is likely to become of primary concern in processing the available information, as mood management theories propose (see Clark & Isen, 1982; Isen & Simmonds, 1978; Morris & Reilly, 1987; Wegener & Petty, 1994). Indeed, our negative mood participants were more attentive to positive than to negative aspects of the information about their caffeine consumption. They were thus able to improve their mood, but this came at the expense of adopting a healthier attitude toward caffeine consumption. In contrast, our positive mood participants were no less and even more attentive to negative than to positive information regarding their caffeine consumption.

They were thus able to adopt healthier attitudes toward caffeine consumption, but this came at the expense of their positive mood. In a sense, therefore, it may be argued that positive mood participants were engaging in a kind of long-term mood management strategy by focusing on important health-related information that could potentially enhance their general well-being in the future (see Wegener et al., 1995).

Affect as Information

Findings from several previous studies on mood and information processing have documented evidence in support of the affect-as-information theory (e.g., Bless et al. 1990; Gorn, Goldberg, & Basu, 1993; Pham, 1998; see Schwarz & Clore 1996). Across these studies, participants in a negative state engaged in more elaborate processing compared with those in a positive state. The results obtained in our low self-relevance conditions are consistent with these results. The affect-as-information theory thus appears to predict elaboration for tasks that are low (vs. high) in self-relevance. Indeed, evidence from a few other recent studies conceptually supports this proposition (e.g., Estrada, Isen, & Young, 1997; Isen, 2000).

Integrating Research on Mood and Information Processing

In summary, it appears that positive mood acts as a resource when the information-processing task is high in self-relevance and that positive mood acts as a goal when the current mood state is negative and the task is high in self-relevance. When the task is low in self-relevance, mood serves as information. Overall, our research appears to integrate previous work on mood and information processing. However, several apparent discrepancies remain. For example, Bless et al. (1990) found that participants in a negative (vs. positive) mood tended to engage in more elaborate processing when exposed to counterattitudinal information (on student services fee increases). This finding appears to run counter to our predictions and findings: If an increase in student fee increases is important (as it should be to students), should not positive mood subjects have processed such information more elaborately?

We argue, however, that positive mood serves as a resource only under conditions in which engaging in elaborate processing can determine a future outcome. If a task is not perceived to have the potential to determine a future outcome—and hence does not offer any long-term benefits—it is unlikely that positive mood will be used as a resource. In the Bless et al. (1990) studies, although the topic was important, it is unlikely that the participants perceived that elaborating on the information could actually determine the outcome (i.e., increase in fees). Put differently, we use the term *self-relevance* to refer to the relevance of processing elaborately or of learning from the task rather than the relevance of the issue in focus.

Our results are also somewhat inconsistent with the findings from Wegener and Petty's (1994) studies, in which happy, neutral, and sad mood participants were asked to rank different (happy, sad, etc.) videotapes that (they believed) they would watch subsequently. Positive (vs. negative) mood participants in these studies tended to exhibit stronger mood management tendencies compared

with those in a negative mood—that is, those in a positive mood tended to be more selective (compared with neutral and negative mood participants) about which videos they would want to watch. Our results, in contrast, appear to suggest that participants in a positive mood tend to expose themselves to negative (but useful) information. Once again, we believe that the discrepancy in results may be due to the moderating role played by the potential of the task in determining future outcomes. We believe that the video-ranking task used in Wegener and Petty's study has little potential to affect self-relevant outcomes (other than mood). Under such circumstances, it is not surprising that positive mood acted as a goal rather than as a resource.

Related to the potential impact on future outcomes is controllability of the outcomes. In our experiments, participants were exposed to the negative effects of caffeine consumption. Presumably, our participants felt that they could control their future intake of caffeine and hence found it worthwhile to process information in the essay, even if it was negative. If, instead, participants had been exposed to information about an issue that they perceived to be beyond their control (e.g., AIDS or cancer), it is possible that positive mood may not have served as a resource, as elaborating on the negative information for uncontrollable events has no associated long-term benefits (see Trope, Hassin, & Gervy, 2001).

The present studies extend earlier research on self-relevant information search (Trope & Neter, 1994; Trope & Pomerantz, 1998). The earlier studies showed that positive mood promoted search for negative self-relevant feedback. Moreover, Trope and Neter found that when negative feedback regarding an important ability was offered, participants spontaneously tried to self-induce a positive mood before actually taking the feedback. Positive mood was apparently used to facilitate balanced search of useful feedback. A possible interpretation of these findings is that positive mood participants solicited negative feedback because they felt they could refute it. The present findings argue against such interpretation. Compared with negative mood, positive mood led our participants not only to attend to negative self-relevant information but also to change their prior belief in line with its implications.

Self-Esteem as a Resource

Recent research suggests that the effects of self-esteem on information processing may be analogous to those of mood (Aspinwall, 1998; Aspinwall & Brunhart, 1996; Aspinwall & Taylor, 1997; Reed & Aspinwall, 1998; Sherman, Nelson, & Steele, 2001; Steele, 1975; Steele & Liu, 1981, 1983; Steele, Spencer, & Lynch, 1993). Specifically, this research shows that optimism and self-affirming experiences promote attention to, recall, and use of information about one's potential health problems. Similarly, Trope et al. (2001) recently found that positive self-views regarding one's social skills promote attention to feedback regarding stable deficiencies in one's social skills. Thus, like positive mood, high self-esteem may serve as a resource, enabling individuals to cope with the emotional costs of negative self-relevant information. High self-esteem may sometimes weaken the perceived need for new information and may become a goal in itself (Steele, 1988; Tesser 2000; Tesser et al., 1996). However, when the long-term value of new information is unambiguously high, high self-esteem may enhance unbiased processing and use of this information.

High self-esteem may thus serve to promote accurate self-assessment and self-improvement.

In conclusion, it is important to point out that although the present research focuses on mood and the processing of self-relevant information, the findings serve to illustrate the more general role of affect in self-regulation. Effective self-regulation requires that one overcome temptations and keep the big picture—the attainment of one's core, superordinate goals—in focus. Self-regulation failures often result from overweighing momentary but very concrete and vivid wishes at the expense of ones' more abstract goals (Baumeister & Heatherton, 1996; Metcalf & Mischel, 1999). The present research suggests that positive affect is one of the factors that may enable individuals to transcend momentary temptations and remain committed to their overarching goals. An exploration of the mechanisms that underlie these self-regulatory consequences of positive affect remains an interesting issue for future research.

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