

The Role of Thought Suppression in the Bonding of Thought and Mood

Richard M. Wenzlaff
University of Texas at San Antonio

Daniel M. Wegner
University of Virginia

Stanley B. Klein
University of California, Santa Barbara

The idea that thought suppression creates a unique bond between the suppressed item and one's mood state, such that the reactivation of one leads to the reinstatement of the other, was examined. In Experiment 1, subjects who were induced by music to experience positive or negative moods reported their thoughts while trying to think or not think about a white bear. When all subjects were subsequently asked to think about a white bear, those who were in similar moods during thought suppression and later expression displayed a particularly strong rebound of the suppressed thought. In Experiment 2, subjects' moods following the expression of a previously suppressed or expressed thought were assessed. Analysis of the mood reports showed that subjects who had initially tried to suppress their thoughts experienced a reinstatement of the mood state that existed during the initial period of suppression.

Suppressing a thought, at least on the face of it, seems uncomplicated enough. All one needs to do is think of other things. Unfortunately, people often find suppression so difficult that they need to think of other things again and again. As each new distracter fails, they keep trying to find new ones, and in this process they sample an unusually wide selection of the experiences and memories that are currently on their minds. Often these efforts to suppress thoughts coincide with strong emotional states, and people's selection of distracters will inevitably be colored by these feelings. The striking result of this process is that the suppressed thought becomes bonded to the mood state they were experiencing at the time they suppressed it.

Our research was designed to test this reasoning in two ways. First, if suppression of a thought bonds thought and mood, later occurrences of the mood should promote the return of the suppressed thought. This was the concern of Experiment 1. The focus of Experiment 2 was a test of the complementary hypothesis: Suppression of a thought during a mood should make it likely that when the thought is later expressed, the mood state will return.

To understand how suppression can produce an enhanced connection between thought and mood, it is necessary to examine what occurs when one tries to eliminate a thought. Obviously, conscious awareness precludes the elimination of thought entirely—one must think about *something*. Thus, the essence of successful suppression is turning the focus of one's attention away from the unwanted item and toward other thoughts. In-

deed, research on thought suppression has indicated that this is generally what people try to do. An individual reporting the stream of consciousness while trying not to think of a white bear, for example, will typically mention features of the room, plans for upcoming activities, memories of recent events, and the like. Although the unwanted thought tends to return repeatedly, each new intrusion is typically followed by an attempt to think of yet something else (Wegner, Schneider, Carter, & White, 1987).

Such *unfocused self-distraction* is quite unlike the form of distraction that has typically been envisioned by psychologists and examined in research (Wegner, 1989). Distraction has traditionally been understood only as what happens when people are led to focus on a single distracter such as a particular thought or stimulus (McCaul & Malott, 1984). This is not the natural strategy people elect during suppression, however, as they tend instead to reject distracters that do not work and select new ones following each intrusion. The strategy of unfocused self-distraction creates a unique opportunity for the formation of associations between many of the person's current concerns and the unwanted thought. Many items on the person's mind are prone to be selected as distracters, and in each case, the selection occurs immediately after the person has failed to suppress and is thinking of the unwanted thought.

It makes sense that under these conditions, the distracters can later become reminders of the unwanted thought and so prompt its return, especially when suppression is released. This is exactly what has been observed in research on postsuppression rebound effects (Wegner et al., 1987). People who suppress a thought and then are encouraged to concentrate on it show a relative rebound of thoughts about the item as compared with those individuals who are encouraged to concentrate on the thought from the outset.

The idea that distracters turn into reminders implies that there should be strong effects of context on the rebound of suppressed thought. And, in fact, such effects have been sub-

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Correspondence concerning this article should be addressed to Richard M. Wenzlaff, Division of Behavioral and Cultural Sciences, University of Texas, San Antonio, Texas 78285.

stantiated by Wegner, Schneider, Knutson, and McMahon (in press). When subjects suppress a thought during the context of a slide show on one theme (e.g., classroom scenes), and then are asked to express the thought during a show in which the theme is changed (e.g., to household appliances), the rebound does not occur. However, when the original slide show theme is reintroduced during another opportunity for expression, these subjects show a remarkable rebound of the thought. Analyses of the think-aloud protocols of subjects in this study indicated that they indeed focused more on context during suppression than during expression of the thought—and that subsequent mentions of the slide show context were strongly associated with the rebound following suppression.

A positive or negative mood is likely to operate like a physical context in supplying the distracters people use during suppression. It has been found, for instance, that depressed people trying not to think of an unwanted thought (either positive or negative) tend to choose negative thoughts as distracters, whereas nondepressed people more often choose positive thoughts for this purpose (Wenzlaff, Wegner, & Roper, 1988). Whenever the mood returns, these mood-relevant thoughts are likely to be accessed again, and the rebound of the previously suppressed thought should thus be accentuated at this time. In other words, the suppression-induced rebound effect should show mood dependency.

The strong association of thought and mood that occurs during thought suppression can be contrasted with the weak association that occurs in the case of expression of the thought during the mood. When people consciously rehearse or elaborate a thought in a mood, very few associations are formed between the target thought and the constellation of thoughts that may be prompted by the mood. For instance, an unhappy person who is trying to think about a white bear will focus attention on thoughts that are relevant to white bears—the North Pole, white fur, dark eyes and noses, the zoo, Eskimos, and so on. Unhappy thoughts will probably not become the focus of attention very often, and this absence will reduce the likelihood that mood-related associations will be made. Although there is evidence that associations can be formed even when items are not in awareness during encoding, such associations seem to be the exception to the more general rule that associative learning requires attention (e.g., Hasher & Zacks, 1979). Any mood effects that are created during thought expression, then—such as an increase in the accessibility of white bear thoughts during a later instance of unhappiness—would be relatively minimal.

During suppression, however, mood associations with the target thought should be encoded strongly because the thought is repeatedly given attention in alternation with mood-related distracting thoughts. Many mood-related cues to the unwanted thought are formed with the aid of this conscious attention, as the mood-related thoughts used as distracters are considered one by one as substitutes for the unwanted thought. This associative process should have two observable effects. First, it should increase the likelihood that the previously suppressed thought will recur when the relevant mood is encountered again. Second, it should increase the likelihood that the mood itself will return if the thought was released from suppression. We examined these implications in two studies.

Experiment 1: Mood-Dependent Rebound of Suppressed Thought

In this experiment we tested the notion that the reintroduction of the mood state that existed during suppression would create a particularly robust rebound of thoughts about the previously suppressed item during a period of thought expression. We began by asking participants either to suppress or to express thoughts about a white bear. During that time we influenced subjects' moods by playing either positive or negative musical recordings. Later, all subjects were asked to think about a white bear, and music was again used to induce either positive or negative moods. In line with past results (Wegner et al., 1987), we expected that subjects who suppressed the thought would later show more frequent occurrences of the thought during expression than subjects who had first expressed the thought.

The more important prediction was that this rebound effect would be moderated by the influence of mood. Subjects initially suppressing the thought who then express it in the same mood should show the greatest rebound, whereas those who express it in a different mood should show a lesser rebound. Because expression does not bond mood and thought, we expected that subjects initially expressing the thought who later express it in the same mood would show no greater thought occurrence during the second expression period than those asked to express it in a different mood.

Method

Subjects. Introductory psychology students (66 women and 46 men) from the University of Texas at San Antonio participated in the study. The subjects ranged in age from 18 to 41 years with a median age of 20.

Procedure. Subjects assembled in small groups. The experimenter advised participants that the study included several different tasks involving thought reports, problem solving, and self-descriptions. The experimenter explained that during the first part of the study, they were simply to write down their thoughts as they occurred. Before subjects began reporting their thoughts, however, the experimenter introduced the first two experimental manipulations. The experimenter started a musical recording under the pretext that previous research had indicated that music facilitated thought reporting. Actually, we intended the recordings to promote either positive or negative moods among subjects (see D. M. Clark, 1983). Thus, subjects heard one of two upbeat recordings (selections from *Beleze Tropical*, *Brazil Classics 1*, compiled by David Byrne, or *Bach's Brandenburg Concerto No. 3*, jazz version by Hubert Laws) or one of two somber recordings (*Russia Under the Mongolian Yoke*, *Field of the Dead*, from *Alexander Nevsky*, *Op. 78*, by Prokofiev, or *Spheres*, *Movements 6 and 7*, by Keith Jarrett).

The second experimental manipulation involved the instructions subjects received prior to making their thought reports: The experimenter advised half the subjects to try *to think* of a white bear, whereas the other half were asked to try *not to think* of a white bear. At the outset of the 9-min stream-of-consciousness time period, the experimenter instructed all subjects to make a check mark in a column on the right-hand side of the page every time they thought about a white bear. This measure was included to capture any reportable thoughts that happened too quickly for written acknowledgment. The musical recordings played throughout the 9-min thought-report period.

At the end of the thought-report period the experimenter stopped the recording and asked subjects to rate themselves on a variety of

personal adjectives. The experimenter explained that the purpose of these ratings was to assess the validity of this relatively new measure. The actual purpose was to assess subjects' moods. The measures consisted of 24 personal adjectives each on a 7-point Likert scale. Among the adjectives were 9 items from the Multiple Affect Adjective Check List (Zuckerman & Lubin, 1965) selected to span both the pleasantness–unpleasantness and arousal dimensions of mood (sad, anxious, content, gloomy, grouchy, inspired, blue, merry, and peppy; cf. Watson & Tellegen, 1985). These 9 items constituted our mood measure. We included the remaining 15 adjectives (e.g., permissive, materialistic, and scientific) to distract subjects from the purpose of the ratings and thereby minimize any experimenter-demand characteristics.

For the next 15 min subjects worked on unscrambling anagrams. The experimenter explained that this task was a measure of problem-solving abilities. The actual purpose of this task was to allow enough passage of time for subjects' moods to stabilize. After the anagram task, the experimenter again asked subjects to report their thoughts during a 9-min time period. This time the experimenter instructed all subjects to try to think about a white bear. Half the subjects listened to a somber musical recording and half listened to an upbeat recording. The two versions of each of the upbeat and somber recordings were counterbalanced in such a way that no subject heard the same recording during the first and second thought-report time periods. After the second thought-report time period subjects completed the personal adjective scales again (the second mood measure). The experimenter then debriefed the subjects. After receiving assurance that the subjects understood the purpose of the study, the experimenter thanked them for their participation and invited them to discuss any concerns or misgivings they may have had about the procedure. No one expressed any problems concerning the experiment.

Results and Discussion

Mood manipulation check. We counterbalanced the musical recordings such that one group of subjects heard upbeat music during the first time period and somber music during the second period (pos–neg condition), a second group heard upbeat music during both periods (pos–pos), a third listened to somber music first followed by upbeat music (neg–pos), and a fourth group heard somber music at both time periods (neg–neg). To derive a measure of subjects' mood responses to the music, we computed mean scores on the 9-item mood adjective scales following each musical session. Mean mood scores could range from 1 (*very negative*) to 7 (*very positive*). We entered these scores into a $4 \times 2 \times 2$ analysis of variance (ANOVA) with two between-subjects variables—music order (pos–neg vs. pos–pos vs. neg–pos vs. neg–neg) and thought instructions (suppression vs. expression)—and one within-subjects variable—mood report time period (Time 1 vs. Time 2).

As expected, the results revealed a reliable interaction involving music order and mood report time period, $F(3, 104) = 15.30, p < .001$. Analysis of this interaction indicated that subjects in the pos–neg condition reported more positive moods at Time 1 than at Time 2 ($M_s = 4.80$ and 3.73 , respectively), $F(1, 27) = 33.41, p < .001$, whereas subjects in the neg–pos condition reported more negative moods at Time 1 than at Time 2 ($M_s = 3.83$ and 4.84 , respectively), $F(1, 27) = 13.03, p = .001$. The mood ratings of subjects in the pos–pos condition did not reliably differ from Time 1 to Time 2 ($M_s = 4.59$ and 4.44 , respectively), $F(1, 27) = 1.30, p = .27$, nor did the ratings of subjects in the neg–neg condition ($M_s = 3.95$ and 3.99 , respectively; $F < 1$).

Overall, subjects' mood scores for the first and second time periods were reliably more positive in the upbeat music conditions ($M_s = 4.70$ and 4.64 , respectively) than in the somber ones ($M_s = 3.89$ and 3.86 , respectively), $F(1, 110) = 20.40, p < .001$, and $F(1, 110) = 21.52, p < .001$, respectively. Thus, our mood manipulation achieved its intended purpose. Moreover, the mood ratings did not reliably vary as a function of the thought instructions ($F_s < 1.15$), thereby indicating that suppression and expression subjects were equally influenced by the mood-induction procedure.¹

We used two different recordings each for the positive and negative mood inductions. To ensure that these different versions had comparable effects, we analyzed subjects' mood scores in an ANOVA with two levels of the music variable (Version 1 vs. Version 2) for each of the positive and negative mood conditions and for both mood assessments. These analyses indicated that the two versions of somber recordings did not produce reliably different mood scores at the first mood assessment ($M = 4.01$ vs. $M = 3.77$) or the second mood assessment ($M = 3.81$ vs. $M = 3.90$; both $F_s < 1$). Similarly, there were no reliable differences in the mood effects of the two versions of the upbeat recordings at the first or second mood assessments ($M = 4.63$ vs. $M = 4.76$ and $M = 4.62$ vs. $M = 4.67$, respectively; both $F_s < 1$).

Thought instruction manipulation check. During the first thought-report time period, half the subjects were asked to think about a white bear and half were asked *not to think* about a white bear. To assess the effect of this manipulation, we analyzed subjects' thought reports for the number of times they mentioned a white bear and the number of times they made a check mark indicating the occurrence of a thought about a white bear.

Judges blind to experimental condition coded the first thought-report time period for the number of times subjects mentioned a white bear. Intercoder reliability, computed as the correlation between a pair of coders within a session, averaged .94. We analyzed the number of times subjects mentioned a white bear using a 2 (positive mood vs. negative mood inductions) $\times 2$ (suppression vs. expression instructions) ANOVA. This analysis revealed a reliable main effect for the type of instruction indicating that subjects who were asked to suppress thoughts of a white bear mentioned it less often ($M = 6.80$) than those who were asked to think of a white bear ($M = 21.13$), $F(1, 108) = 251.20, p < .001$. There were no reliable effects associated with the mood-induction variable ($F_s < 1$). A similar pattern was obtained using a parallel analysis examining the number of times subjects made check marks indicating the occurrence of a white bear thought: Subjects in the suppression condition made fewer check marks ($M = 8.36$) than did subjects in the expression condition ($M = 22.75$), $F(1, 108) = 966.61, p < .001$. Again, there were no reliable effects associated with the mood variable. Thus, it appears subjects complied with the ex-

¹ We obtained parallel results with a $2 \times 2 \times 2 \times 2$ ANOVA with first music recordings (positive vs. negative), second music recordings (positive vs. negative), and thought instructions (suppression vs. expression) as between-subject variables, and mood report time period (Time 1 vs. Time 2) as a within-subject variable. There were no reliable effects associated with the thought instructions variable ($F_s < 1.15$).

perimental instructions concerning the expression or suppression of white bear thoughts.

Thoughts associated with mentions. A key part of our reasoning regarding the process whereby mood and thought are bonded during suppression involves the degree to which suppression prompts mood-relevant thoughts. When people try not to think about something, we suspect they are especially apt to focus on distracters that are colored by their mood state. When they try to think about something, in contrast, any other thoughts that come to mind tend not to be strongly mood related because they are instead related in some way to the intended expression topic. To test this prediction, we examined the valence of thoughts subjects reported before and after each mention of a white bear occurring in the initial experimental session. Judges blind to experimental condition rated the emotional valence of these mention-associated thoughts using a 7-point scale, with higher numbers indicating greater positivity. The correlation between the two judges was .88. We examined the mean ratings in an ANOVA with two between-subjects variables (positive vs. negative mood induction and suppression vs. expression instructions) and one within-subjects variable (whether the rated thought preceded or followed the mention of a white bear).

As expected, the results of the ANOVA revealed an interaction between subjects' moods and the suppression versus expression instructions, $F(1, 108) = 13.73, p < .001$. As can be seen in Figure 1, thoughts associated with mentions during suppression reflect the subjects' induced mood, whereas those associated with mentions during expression show less mood influence. A Newman-Keuls analysis ($p < .05$) indicated that subjects suppressing during a negative mood reported more negative mention-associated thoughts than did any other group. Subjects suppressing during a positive mood reported more positive mention-associated thoughts than did any other group. Furthermore, there were no reliable differences in the rated valence of the mention-associated thoughts between the expression groups.

Although the results of the present analysis are consistent

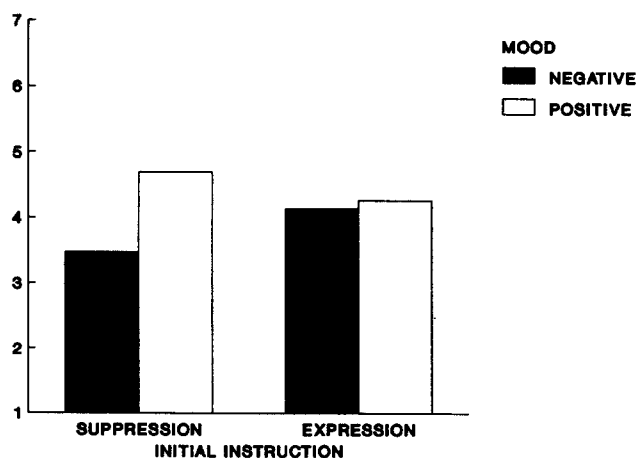


Figure 1. Mean rated positivity of thoughts occurring in association with mentions of a white bear during initial suppression or expression of white bear thoughts.

with our theoretical reasoning, one might also have expected that suppression subjects' thoughts following white bear mentions would be even more mood congruent than their preceding thoughts. This difference would be predicted if one assumes that for suppression subjects, thoughts following white bear mentions are more apt to reflect active distraction efforts than thoughts preceding mentions. Hence, thoughts following white bear mentions should show enhanced mood congruency by virtue of the relatively greater role that mood context plays in the selection of distracters. The lack of a reliable thought-sequence effect may have occurred here because white bear mentions were often separated by only one thought, and this thought therefore was scored as both preceding and following a mention. Despite the absence of a thought-sequence effect, however, the obtained suppression-related differences in mention-associated thoughts support our notion that suppression enhances the influence of emotional context on thought processes.

Mood-dependent rebound of suppressed thought. We predicted that an association between mood and thought would be created when one attempts to suppress a thought. This association should lead to a rebound of thoughts about the originally suppressed target when one is free to think of the item and is in a mood similar to the one experienced during the period of suppression. Such a rebound should not occur for a thought that is originally expressed in the same mood. To test this prediction, we categorized subjects on the basis of mood-induction conditions as either being in the same or a different mood during the second thought-report period. We analyzed the number of times subjects mentioned a white bear and made check marks during the second thought-report period in a 2×2 ANOVA with mood (same vs. different) as one variable and initial instructions (suppress vs. express) as another variable.²

As predicted, the number of times subjects mentioned a white bear during the second thought-report time period varied as a function of initial instructions, $F(1, 108) = 59.40, p < .001$. Subjects who initially suppressed the thought expressed it more frequently later than did subjects who initially expressed the thought. This finding is consistent with the rebound effect found in previous research on thought suppression (e.g., Wegner et al., 1987).

This main effect was qualified by the predicted interaction. Expression in the second time period varied as function of mood state and initial instructions, $F(1, 108) = 7.92, p = .006$ (see Figure 2). The results of a Newman-Keuls analysis ($p < .05$) showed that whereas subjects who suppressed the thought in one mood and expressed it in another did show a significant rebound during expression, those who suppressed and then expressed in the same mood showed a reliably greater rebound still. For subjects who initially expressed the thought, mood during later expression had no effect on the frequency of thought occurrence at that time.

The results of the analysis examining the number of marks

² We conducted a similar analysis that included mood valence (positive vs. negative) as a variable. There were no reliable effects associated with this variable ($F_s < 1$), so we did not include it in the analysis reported here.

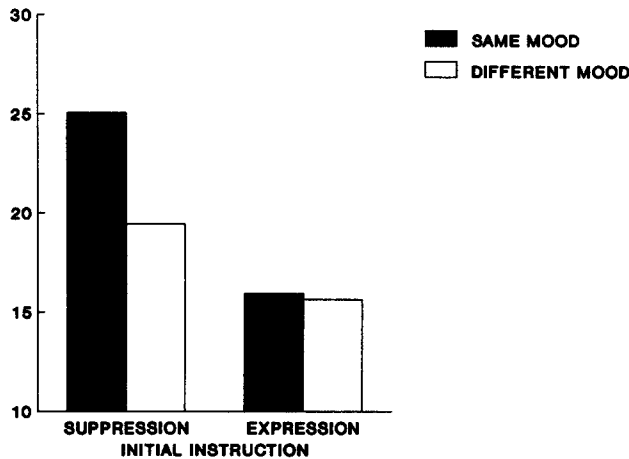


Figure 2. Mean number of times subjects mentioned a white bear under instructions to think about it during the second thought-report period.

during the second thought-report time period paralleled those of the mentions analysis. We obtained a reliable interaction involving mood state and initial instructions, $F(1, 108) = 9.37$, $p = .003$. The Newman-Keuls analysis ($p < .05$) of this interaction produced a pattern of results identical to the mentions analysis. Taken together, then, the results of the mentions and marks analyses provide converging evidence for the idea that the reactivation of suppression-related mood states during expression leads to an enhanced rebound of suppression-relevant thoughts.

Relationship between intrusions and later expressions. There is reason to suspect that the obtained enhanced rebound effect for the same-mood suppression subjects would be positively correlated with the number of times they experienced white bear thoughts during the initial period of suppression. This prediction is based on the idea that the repeated juxtaposition of intrusive thoughts and mood-congruent distracters promotes associative links between the unwanted item and the mood state. The larger the number of these associations, the more likely it is that they will prompt thoughts about the suppression target when the original mood state is reactivated and expression is allowed.

To test this line of reasoning, we examined the correlation between the number of white bear mentions during the first and second thought-report sessions for each group of subjects. The results indicated a reliable positive correlation for subjects who initially suppressed and later expressed in the same mood, $r(28) = .54$, $p = .002$. There were no significant correlations among the other groups of subjects (all $ps > .20$). The reliable positive correlation that we obtained for same-mood subjects between intrusions during suppression and later mentions during suppression and later mentions during expression is particularly noteworthy because this effect has not been found in previous research (e.g., Wegner et al., 1987). However, this previous research did not examine the impact of mood congruency on postsuppression processes. The present results highlight the important role that moods can play in suppression-related phenomena: Emotional states seem to serve both

as a context for the development of associations during suppression and as later cues for those associations.

In sum, the results of Experiment 1 indicate that simply entertaining a thought in a mood was not sufficient to promote the recurrence of the thought in that mood. Mood-state dependency was not observed when subjects initially expressed a thought and then were asked to express it again. Our findings instead provide strong support for the hypothesized importance of suppression for producing a mood-state-dependent rebound of thought. The rebound of a suppressed thought was most apt to occur when the thought was expressed during the same mood state experienced during initial suppression. The finding that subjects more often experienced mood-relevant thoughts in association with mentions of a white bear during suppression than during expression suggests the process whereby this effect occurs. Suppression prompts a focus on mood-related thoughts in juxtaposition with the unwanted thought such that later reminding of the unwanted thought through mood-related cues is facilitated.

Experiment 2: Mood Resurgence During Rebound of Suppressed Thought

In this experiment we examined the idea that when one suppresses a thought in a particular mood, that mood is likely to be reinstated later if one has an opportunity to think about the suppression target. During the first part of the experiment we asked subjects either to think or not to think about a white bear while we played recordings designed to evoke positive, negative, or neutral moods. Later we instructed all subjects to think about a white bear and we subsequently assessed their moods. We predicted that those who had initially suppressed would, during expression, experience a mood similar to the one during suppression. In contrast, those who had initially expressed the thought would, during later expression, exhibit no special inclination to experience a reinstatement of their original mood.

Method

Subjects. Introductory psychology students (51 women and 33 men) from the University of Texas at San Antonio participated in the study. The subjects ranged in age from 18 to 39 years with a median age of 20.

Procedure. The procedure was similar to the one we used in the first experiment. Subjects assembled in small groups and the experimenter informed them that they would be doing a variety of tasks beginning with an exercise in thought reporting. Prior to the 9-min thought-report period, the experimenter instructed half the subjects to try to think of a white bear and the other half to try not to think of white bear. As in Experiment 1, subjects were advised to make a check mark every time they had a white bear thought. Also, prior to and during the thought-report period the experimenter played one of three recordings designed, respectively, to evoke positive mood (the *Beleze Tropical* selection from Experiment 1), to evoke negative mood (the *Alexander Nevsky* selection from Experiment 1), or to have a neutral impact on mood (*Common Tones in Simple Time*, by John Adams).

As in Experiment 1, after the 9-min thought-report period subjects completed the personal adjective scales (containing the mood measure) and for the next 15 min worked on the anagram task (intended to allow time for their moods to stabilize). Following the anagram task, all subjects were asked to think about a white bear and write down their thoughts during another 9-min thought-report period. In contrast to

Experiment 1, the experimenter did not manipulate mood by playing musical recordings during this second thought-report period. After the thought-report period, subjects completed the personal adjective scales again. Subjects were then debriefed using the procedure of Experiment 1.

Results and Discussion

Mood manipulation check. We calculated subjects' mean scores on the 9-item mood adjectives contained in the first set of personal adjective scales. To assess the effectiveness of the musical mood manipulation for the initial thought-report period, we entered these scores into a 2×3 ANOVA with thought instructions (suppression vs. expression) and music (upbeat vs. somber vs. neutral) as the variables. As expected, the results indicated a main effect for music, $F(2, 78) = 16.67, p < .001$. A Newman-Keuls analysis indicated that subjects in the positive mood-induction group reported more positive moods ($M = 4.92$) than did subjects in the neutral mood condition ($M = 4.16$), who in turn reported more positive moods than those in the negative mood condition ($M = 3.73, p < .05$) in each case. There were no reliable mood effects associated with the thought instructions variable ($F_s < 1.07$).

Suppression instruction manipulation check. As in the first experiment, during the first thought-report time period half the subjects were asked to try to think about a white bear and half were instructed to try not to think about a white bear. To assess the effectiveness of this manipulation, we analyzed subjects' thought reports for the number of times they mentioned a white bear and the number of times they made a check mark indicating the occurrence of a thought about a white bear.

Judges blind to experimental condition coded the first thought-report time period for the number of times subjects mentioned a white bear. The codings of two judges correlated .96. We analyzed the number of times subjects mentioned a white bear using a 2 (suppression vs. expression instructions) \times 3 (positive vs. negative vs. neutral mood induction) ANOVA. This analysis revealed a reliable main effect for instruction, indicating that subjects who were asked to suppress thoughts of a white bear mentioned it less often ($M = 6.43$) than those who were asked to think of a white bear ($M = 22.38$), $F(1, 78) = 157.87, p < .001$. There were no reliable effects associated with the mood-induction variable ($F_s < 1$). An identical pattern was obtained using a parallel analysis examining the number of times subjects made check marks indicating the occurrence of a white bear thought: Subjects in the suppression condition made fewer check marks ($M = 8.69$) than did subjects in the expression condition ($M = 24.74$), $F(1, 78) = 193.96, p < .001$. As with the mentions analysis, there were no reliable effects associated with the mood variable.

Mood resurgence during rebound of suppressed thought. As noted earlier, previous research (Wegner et al., 1987) has found that individuals who concentrate on a previously unwanted thought following a period of suppression show a particularly robust rebound of thoughts about that item. We predicted, then, that subjects in the initial suppression condition would report more thoughts about a white bear during the second thought-report time period than would subjects in the initial expression condition. Moreover, and of most relevance to the

present thesis, we predicted that this rebound would be accompanied by a relative reinstatement of the moods subjects were in during the initial suppression time period. Such reinstatement would not occur in the case of expression following an initial expression time period. To test these predictions, we first examined the content of subjects' second period of thought reporting for the occurrence of the suppression rebound effect.

We analyzed the number of times subjects mentioned a white bear during the second period of thought reporting using a 2 (initial suppression vs. initial expression) \times 3 (positive vs. negative vs. neutral initial mood induction) ANOVA. This analysis showed that subjects who were initially asked to suppress mentioned a white bear more often during the second thought-report time period than did subjects who were initially given expression instructions ($M = 22.60$ vs. $M = 15.45$, respectively), $F(1, 78) = 62.99, p < .001$. There were no reliable effects associated with the mood-induction variable. An identical pattern was obtained in the analysis of the number of check marks made during the second thought-report time period. Subjects initially given suppression instructions made more check marks ($M = 24.74$) than did subjects given expression instructions ($M = 17.14$), $F(1, 78) = 85.13, p < .001$. As with the mentions results, there were no reliable effects associated with the mood-induction variable.

To test our prediction that suppression would create an association between the unwanted thought and the mood state during suppression, we examined subjects' moods following the second thought-report time period. We calculated subjects' mean scores on the 9-item mood adjectives contained in the second set of personal adjective scales and entered those scores into a 2 (initial suppression vs. initial expression) \times 3 (positive vs. neutral vs. negative initial mood induction) ANOVA. As we predicted, this analysis revealed a reliable interaction between initial suppression instructions and initial mood, $F(2, 78) = 8.29, p = .001$ (see Figure 3). A Newman-Keuls analysis indicated that subjects who initially engaged in suppression during a negative mood state reported significantly more negative moods following the second thought-report period than did any other group of subjects ($p < .05$). By the same token, subjects who initially engaged in suppression during a positive mood state reported significantly more positive moods after the second thought-report period than did any other group ($p < .05$). There were no reliable differences among the other groups.

Relationship between intrusions and later moods. As we noted earlier, our formulation suggests that during suppression the repeated juxtaposition of intrusive thoughts and mood-congruent distracters promotes associative links between the unwanted item and the mood state. One implication of this idea is that the larger the number of these associations, the more likely it is that they will prompt a return of the suppression-associated mood when expression is allowed. To test this notion, we examined the correlation between the number of white bear mentions during the first time period and subjects' moods after the later expression time period.

As predicted, this analysis revealed a reliable correlation for suppression subjects in the positive mood condition between the number of times they mentioned a white bear during the initial time period and their mood state after the later expression period, $r(14) = .64, p = .007$. The correlation between

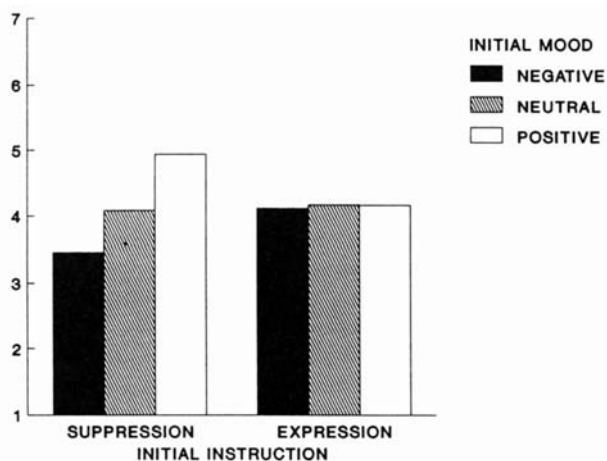


Figure 3. Mean positivity of subjects' mood ratings after the second thought-report period.

intrusions and later mood state was also in the predicted direction for suppression subjects in the negative mood condition, $r(14) = -.31, p = .14$. These results indicate that for these two groups of subjects, the more intrusions they experienced during suppression, the more likely it was that they would experience a reinstatement of the suppression-associated mood state following later expression. There were no reliable correlations of this nature among the other experimental groups (all $ps > .28$).

General Discussion

Our results suggest that thought suppression creates a particularly strong bond between suppressed thoughts and their associated moods. This bond provides a dual pathway between the thought and the mood such that the activation of one leads to the reinstatement of the other. In the first experiment, subjects who experienced similar moods during suppression and expression displayed a particularly strong rebound of target-related thoughts. The results of the second experiment indicate that the reverse is also true: Subjects expressing a thought after suppressing it experienced a reinstatement of the mood state associated with the period of suppression. Bonds of this kind were not created when subjects first expressed a thought in a mood and were asked to think about it again later. These results have several implications for our understanding of the general relationship of moods and thoughts.

The Fragile Association of Thought and Mood

The possibility that thought and mood can become linked has not been established with much confidence by previous research. Most commonly, this idea has been tested by examining just one direction of association—whether moods once paired with thoughts can prompt the thoughts again. In such *state-dependent memory* research, people are asked to memorize multiple items during an induced mood, and retrieval of this material during similar or different moods is assessed. Although there have been some successful demonstrations of the effect (e.g., Bower, Monteiro, & Gilligan, 1978), the preponder-

ance of the experimental evidence rests with the conclusion that state-dependent memory effects for mood are weak—if they exist at all (see, e.g., Blaney, 1986; Bower & Mayer, 1985; Isen, 1987; Morris, 1989).

Perhaps because of this weakness, researchers have not taken the additional step of examining the opposing direction of association in this paradigm (cf. Riskind, 1989). Thus, it has not been determined whether thoughts previously paired with a mood are later able to instigate that mood. There is evidence that happy or sad thoughts can prompt their associated moods (e.g., Teasdale & Bancroft, 1977), but there appears to be no evidence on whether neutral or irrelevant thoughts paired with a mood can, on their recurrence, prompt the return of that mood. The summary implication of research to date on the association of thought and mood, then, is that a simple pairing of the two has not been found to yield a noteworthy association between them. After pairing, induction of one does not reliably produce the other.

The fragility of mood-dependent memory effects has led some researchers to the conclusion that mere pairing is only a weak basis for the formation of associations. In the absence of clear demonstrations of mood dependency, research in the mood and memory area has become reoriented to connections based on the formation of semantic associations of thought and mood. So, for example, research examining mood-congruency effects—such as a connection between happy or sad thoughts and their respective mood states—has been largely successful (see Blaney, 1986; Isen, 1987; Morris, 1989).

The present research offers a promising new paradigm for examining mood-dependent cognitive effects. Unlike memory experiments that have examined the effect of mood on the encoding and retrieval of items, our research examines how the occurrence of a thought in a mood affects the likelihood that the thought will be reencountered when the mood returns. This paradigm is probably a bit more reflective of the operation of moods in daily living, as it escapes the artificiality of an explicit memory task. As in these memory tasks, our paradigm shows no evidence of the bonding of thought and mood due to simple association. Expression of a thought in a mood produced no rebound of the thought when that mood was reinstated, nor did it reintroduce the mood when the thought was reinstated. These types of linkages, however, were created when subjects attempted thought suppression. Our research reveals that thought suppression creates a unique integration of thought and mood, a bonding based on the frequent choice of mood-related distracters and on the proneness of such distracters later to become reminders of the once-suppressed thought. The fact that moods and thoughts can become related in this way provides a basis for a new understanding of how thoughts and moods are linked in everyday life.

Mood and Natural Thought Suppression

Our interest in the everyday form of the interplay of thought and mood leads us to question just when the results we have observed might be expected to occur in natural settings. We would not be too surprised to learn, for instance, that the opportunity to suppress a thought during a positive mood is largely a laboratory-bound phenomenon. People suppress thoughts

when they are happy only in the relatively odd circumstance of being inappropriately happy. People more often avail themselves of the chance to suppress a thought when they are feeling bad—and the thought is a bad one as well. There is considerable evidence that people suppress thoughts when they are depressed (Sutherland, Newman, & Rachman, 1982; Wenzlaff & Wegner, 1990), anxious (Wegner, Shortt, Blake, & Page, 1990), traumatized (Pennebaker, 1988; Silver, Boon, & Stones, 1983), obsessed (Rachman & De Silva, 1978), or inhibited (Polivy, 1990). In general, it seems that attempts to control one's mental state are more frequent during negative than positive moods (M. S. Clark & Isen, 1982; Klinger, 1982).

In daily life, then, we would expect thought suppression to occur primarily during negative mood states rather than positive ones. There is thus the possibility that the processes observed in these studies are largely relegated to negative moods in natural settings and so may, in fact, promote some interesting divergences between the effects of negative and positive moods on thinking. It could be, for example, that negative moods are more inclined than positive ones to participate in cyclic feedback relationships with thoughts. The person suppresses an unpleasant thought during a negative mood, and thus increases the likelihood that the thought will later prompt the mood—and that the mood will prompt the thought. Negative moods may be somewhat “sticky” in this regard, becoming strongly associated with particular (previously suppressed) thoughts only later to elicit and be elicited by them.

The natural choice to suppress thoughts in negative moods would also have the effect of making negative moods more heavily populated with mood-related thought than positive moods. Positive moods, in this view, should be somewhat absentminded and empty, almost unjustified by good thoughts or reasons for the feeling. Negative moods, in contrast, might make accessible not only whatever thought was most recently suppressed in that mood, but in addition all too many others. An unruly horde of thoughts, worries, and unpleasantness could spill into one's mind simply because prior attempts to evict them had bonded them to the bad mood. Perhaps this is why when one feels bad, one always seems to have a fine selection of reasons and gripes.

The persistence of negative moods, then, may be more dependent on thought than is the persistence of positive moods. If negative moods frequently cooccur with thought suppression, their continuation or recurrence may often be dependent on reminiscence of the thoughts. Positive moods, in turn, may be less tied to thoughts for their maintenance or return. This may be why it seems so difficult for people to “think themselves” into a positive mood, whereas they are normally very capable of working their way into the blues by thinking alone. Returning to a thought they once suppressed in a blue mood can prompt the mood, but returning to a thought they once merely expressed in a happy mood has no special power to regenerate the mood.

Most people, of course, do not deliberately try to think themselves into negative moods. Nevertheless, it is an unfortunate fact that negative thoughts dominate the mental lives of many people and promote feelings of helplessness, despair, and ultimately depression. This observation led to the development of cognitive therapy for depression, which has as its primary goal the elimination of negative thoughts. Although cognitive thera-

pists use a variety of strategies to accomplish this goal, our research would caution against attempts at direct thought suppression. Actively trying not to think a negative thought can paradoxically bond that thought to the undesired mood, thus helping ensure the further continuance of each. A more fruitful approach may involve focusing attention on, not away from, the unwanted thought (Frankl, 1960). This type of focused attention could avoid the detrimental bonding of thought and mood that occurs through suppression and may further weaken the influence of the unwanted thought by casting it in a more realistic light (e.g., Beck, 1976; Ellis, 1962).

Conclusions

Our findings indicate that thought suppression plays an important role in bonding thoughts and moods. Although prior research has failed to find robust evidence for this connection, our experiments indicate that thought suppression during a positive or negative mood produces a remarkable level of subsequent affinity between that thought and mood state. Mood-related thoughts are initially brought to mind more often during suppression than during intentional expression of a thought. Then, when the mood is later encountered, the thought is more easily expressed. And, reciprocally, when the suppressed thought is later expressed, the mood returns. This may be the way thoughts and moods are bound to one another in the turmoil of mental life. People try not to think of something—and unintentionally they bond that thought to their mood such that each will later make the other return.

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