

Paradoxical Effects of Thought Suppression

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In a first experiment, subjects verbalizing the stream of consciousness for a 5-min period were asked to try not to think of a white bear, but to ring a bell in case they did. As indicated both by mentions and by bell rings, they were unable to suppress the thought as instructed. On being asked after this suppression task to think about the white bear for a 5-min period, these subjects showed significantly more tokens of thought about the bear than did subjects who were asked to think about a white bear from the outset. These observations suggest that attempted thought suppression has paradoxical effects as a self-control strategy, perhaps even producing the very obsession or preoccupation that it is directed against. A second experiment replicated these findings and showed that subjects given a specific thought to use as a distracter during suppression were less likely to exhibit later preoccupation with the thought to be suppressed.

Consciousness cannot produce a negation except in the form of consciousness of negation.

Sartre, *Being and Nothingness* (1956, p. 43)

It is sometimes tempting to wish one's thoughts away. Unpleasant thoughts, ideas that are inappropriate to the moment, or images that may instigate unwanted behaviors each can become the focus of a desire for avoidance. Whether one is trying not to think of a traumatic event, however, or is merely attempting to avoid the thought of food while on a diet, it seems that thought suppression is not easy. It is said, for instance, that when the young Dostoyevski challenged his brother not to think of a white bear, the child was perplexed for a long while. Contemporary psychology has not focused much inquiry on such puzzling yet important phenomena, and our research was designed to initiate such investigation.

The Problem of Thought Suppression

The idea that people may have unwanted thoughts was one of Freud's fundamental insights, and his notion that people repress such thoughts has long served as a theoretical rallying point in the study of psychopathology (Erdelyi & Goldberg, 1979; Hart, 1934). Still, classical psychoanalytic theory skirts

the most vexing problem of thought suppression: the self-referent quality of the plan to suppress. To suppress a thought requires that one (a) plan to suppress a thought and (b) carry out that plan by suppressing all manifestations of the thought, including the original plan. Thought suppression thus seems to entail a state of knowing and not knowing at once. Freud (1915/1957) made this strange dissociated state theoretically possible by postulating the unconscious and by further specifying that the unconscious was capable of performing the thought suppression for consciousness. So, although the unconscious could not remove the thought from itself, and consciousness also could not remove the thought from itself, the unconscious could perform this housecleaning for the separate, conscious part of the mind.

The psychoanalytic emphasis on such unconscious repression has resulted in a longstanding bias against the examination of consciousness during processes of thought suppression. Rather, the process of suppression has been expected to be observable only after the fact, leaving its mark on memory. Thus, even contemporary research investigates directed forgetting (e.g., Geiselman, Bjork, & Fishman, 1983) and posthypnotic amnesia (e.g., Kihlstrom, 1983) rather than directed inattention or directed conscious avoidance. These lines of investigation do not attempt to explain how or with what effect people go about the conscious task of suppressing a thought. Yet there are multiple instances in everyday life when this is precisely what people try to do. Trying not to think about an upcoming stressful event, avoiding thoughts of smoking while trying to quit, or putting persistent thoughts of a lost love out of mind are common experiences for many. Worries of every kind are similarly conscious thoughts that people express the desire not to have. What happens when people make a conscious effort to avoid a particular thought?

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Although the evidence is sketchy, there is some indication that the task of conscious thought suppression can be difficult. Early studies by McGranahan (1940) and Sears and Virshup (cited in Sears, 1943) showed that people instructed to avoid making color associations to stimulus words often reported such associations nonetheless, even when threatened with shock for doing so. In these cases, of course, people did not know in advance the specific thought they were to suppress, only the general category of colors. More recently, Logan (1983) examined patterns of reaction time to stop signals given as subjects performed brief tasks, and found that although actions can be stopped in midcourse, thoughts seem to run to their conclusion as long as the stimuli activating them are present. Consistent with this, but only broadly relevant, are the outcome studies of the thought-stopping therapy technique. This therapy, suggested by Wolpe and Lazarus (1966) for obsessional disorders, appears generally no more successful than no intervention at all (Reed, 1985).

Another line of evidence arises in research that calls for people to ignore information that is relevant to a judgment they must make. Whether people are instructed to ignore the information before they encounter it (e.g., Wegner, Coulton, & Wenzlaff, 1985) or are told to disregard it afterwards (e.g., Ross, Lepper, & Hubbard, 1975), they tend to incorporate it into subsequent judgments nonetheless. Jurors are influenced by information they have been instructed to disregard (Thompson, Fong, & Rosenhan, 1981), media audiences are influenced by news they are told is untrue (Wegner, Wenzlaff, Kerker, & Beattie, 1981), and people judging odds are influenced by information even when they have been offered money to ignore it (Tversky & Kahneman, 1974). These effects would seem unlikely if people could will away their conscious experience of the thoughts they were instructed to ignore (cf. Sherman & Corty, 1984). The hypothesis suggested by a diverse array of findings to date, then, is that conscious thought suppression is not a cognitive transformation that people perform with great facility.

Consequences of Thought Suppression

The mental state produced by an attempt at thought suppression seems to differ in several ways from that accompanying simple inattention or unintended distraction. The hypothesis suggested by several theorists is that attempts to suppress thoughts (or emotions) can result in a subsequent rebound of absorption with those topics. The prototypic study in this area (Janis, 1958) showed that individuals who are personally inclined to avoid thinking about an upcoming surgery subsequently exhibit more anxious reactions to it. Although the meaning of this finding still is in debate (e.g., Janis, 1983; Lazarus, 1983), there is a degree of theoretical unanimity in the conclusion that avoiding a stressful thought can lead to subsequent intrusions of that thought (e.g., Horowitz, 1975). Even recent research in this domain continues to depend on the preselection of subjects who are prone to suppress (e.g., Burstein & Meichenbaum, 1979), however, and for this reason the processes underlying any transition from suppression to absorption remain unexamined.

The possibility that thought suppression leads to absorption can also be found in the reactions people have to abstinence

from food or addictive substances. Given the assumption that the attempt to avoid a habitual behavior is commonly preceded by attempts to suppress or avoid habit-related thoughts, the pattern of behavior following self-control attempts is informative about the pattern of thinking that may take place. In the case of abstinence from food, for instance, Polivy and Herman (1985) indicated that dieting generally causes subsequent overeating. They cite several converging sources of evidence suggesting that the restraint of eating is a reliable precursor of binge eating and overweight. It seems, then, that the attempt to avoid thoughts of food may lead to a later preoccupation with such thoughts. The more general abstinence-violation effect observed by Marlatt and Parks (1982) suggests that the state of abstinence is a precarious one, in that relapse to an addictive behavior can be triggered by a single, seemingly minor violation of the prohibition. This, too, is consistent with the idea that an initial attempt to suppress thoughts can be followed by an unusual preoccupation with the suppressed thought domain. Their observation suggests further that the event that serves to halt suppression and trigger relapse may be only a single occurrence that draws the person's attention to the originally suppressed thought.

The tentative conclusions suggested by past findings are twofold. First, it seems that thought suppression is difficult for people to do; the conscious avoidance of a thought may be perplexing and even time consuming. Second, there is some evidence to suggest that even when thoughts can be suppressed, they may return to consciousness with minimal prompting, perhaps to become obsessive preoccupations. These general expectations were explored here in two experiments through the expedient of asking people to suppress a thought while they delivered stream-of-consciousness reports in a laboratory setting.

Experiment 1

Method

Subjects and design. Trinity University undergraduates (14 men and 20 women) in introductory psychology classes volunteered to participate in return for extra class credit. Each was randomly assigned to one of two experimental conditions, an *initial suppression* condition or an *initial expression* condition. These conditions differed only in the order of two experimental tasks. For initial suppression, the subject was first instructed to suppress a thought, and then to express it; for initial expression, these instructions were given in reverse order.

Procedure. Each subject participated individually, starting by reading a set of instructions on how to report one's stream of consciousness. The instructions were adapted from those used by Pope (1978) and were fashioned to encourage continuous verbalization. The instructions asked only for subjects to describe what they were thinking; there was no special appeal for the subject to explain or justify the thought (cf. Ericsson & Simon, 1984).

The participant then was asked and gave informed consent to spend several 5-min periods alone reporting to a tape recorder "everything that comes to mind." For each period, it was explained that the experimenter would say "begin" and then leave the room for the duration of the period. After one such practice period, the experimenter returned to issue additional instructions. Participants assigned to the initial suppression group were told the following:

In the next five minutes, please verbalize your thoughts as you did before, with one exception. This time, try not to think of a white

Table 1
Experiment 1: Measures of Thought by Group and Period

Group	Period	
	Suppression	Expression
Initial expression		
Bell with mention	2.75	6.96
Bell only	4.09	4.86
Mention only	0.43	4.56
Initial suppression		
Bell with mention	1.36	8.00
Bell only	4.71	7.71
Mention only	0.23	6.35

Note. $n = 17$ for each group.

bear. Every time you say "white bear" or have "white bear" come to mind, though, please ring the bell on the table before you.

Following this, these participants were given expression instructions for a subsequent period; they were asked for an additional 5 min to "try to think of a white bear." Their task description was otherwise identical to the first, in that they were asked to continue ringing the bell to indicate each instance of the thought. The participants assigned to the initial expression group were given these instructions in reverse order; they were asked in the initial period to try to think of a white bear and in the subsequent period to try not to think of a white bear.

Results

Analysis of the tape recordings was made for (a) bell rings occurring simultaneously with audible mentions of "white bear," (b) bell rings occurring alone, and (c) mentions occurring alone. Intercoder reliability between a pair of coders averaged .94 over the three measures. Table 1 shows the means for each measure by condition.

A 2 (initial suppression vs. initial expression group) \times 2 (suppression period vs. expression period) \times 3 (thought measure) analysis of variance (ANOVA) was conducted on transformed thought token scores. A square root transformation was made to achieve homogeneity of error variance in this analysis (Kirk, 1968, pp. 63–65), but for clarity, the reported means are not transformed.

Tokens of thought were more prevalent in the expression periods than in the suppression periods. The mean of the summed thought measures during expression was 19.22, and this was significantly greater than the suppression mean of 6.78, $F(1, 32) = 41.01$, $p < .0001$. Despite this difference, it is noteworthy that suppression was never complete. Participants indicated thinking about a white bear (through a bell ring, mention, or both) more than once per minute even when directly instructed to try not to think of a white bear.

Tokens of thought were more frequent in the expression period following initial suppression than in the initial expression period. A significant interaction of initial instruction and period, $F(1, 32) = 4.79$, $p < .05$, was comprised of a significant simple main effect of initial instruction group in the expression period, $F(1, 32) = 5.05$, $p < .05$. A similar effect was not observed in the suppression period following initial expression, $F(1, 32) < 1$, indicating an unusual asymmetry: Initial suppres-

sion appears to produce a rebound effect, a surge in the frequency of subsequent thought about the white bear during the expression period.

Evidence of a rebound following suppression also arose in correlational analyses conducted within groups. As would be predicted on the basis of a straightforward individual differences interpretation, the total number of thought tokens for a subject in the two time periods (expression and suppression) was positively correlated among subjects in the initial expression group, $r(17) = .55$, $p < .02$. This was not the case, however, in the initial suppression group. Here, a zero-order correlation indicated an antagonistic relation between thinking of a white bear during suppression and thinking of it during the subsequent expression period. This value, $r(17) = -.10$, was not significantly different from zero but was significantly smaller than the .55 value observed in the other condition ($p < .01$). In the initial suppression group, then, success at the initial suppression task created a readiness for later expression, one that significantly attenuated the more usual tendency for people who express their thoughts at one time to express them at another.

A further indication of the rebound effect was observed in the course of thought occurrences over the 5-min periods. This phenomenon was encountered when a reanalysis of the tapes, by 1-min segments, was made for total bell rings. (Missing data for this analysis resulting from slightly short final 1-min segments for 6 subjects, 3 in each group, were replaced by each subject's total for the prior 1-min segment.) As shown in Figure 1, bell rings per minute increased over time during the expression period in the initial suppression group. This would be unremarkable except that bell rings per minute decreased over time in every other measurement period: in the initial expression group for both expression and suppression periods and in the initial suppression group for the suppression period.

A 2 (initial instruction group) \times 2 (period) \times 5 (1-min segment) ANOVA on square root transformed total bell rings indicated that this trend interaction was reliable. There was a significant three-way interaction of group, period, and linear orthogonal polynomial trend over time segments, $F(1, 31) = 7.02$, $p < .02$. Participants who were allowed to express a thought they had recently suppressed developed an accelerating tendency to report the thought, overcoming the more usual progressive disinterest or fatigue displayed by participants in other periods.

The stream-of-consciousness protocols revealed some interesting facets of the thought-suppression process that are not evident in the counting of thought tokens. The protocols made it clear, for example, that many of the subjects saw the thought-suppression task as difficult or puzzling from the outset. Many also verbalized a strategy soon after encountering the task, saying to themselves, in effect, "Okay, so I'll think of something else." Perhaps most interesting, then, was the manner in which thoughts of the white bear returned to subjects when they were reciting their various replacements for the thought. White-bear mentions and bell rings almost invariably occurred when the subject had finished a sentence or a thought and was silent. During suppression, subjects were generally able to keep from thinking about the target thought, or at least were able to keep from reporting it, as long as they were verbalizing the thought of something else. These sorts of thought intrusions were not common, however, during the expression periods. Here, men-

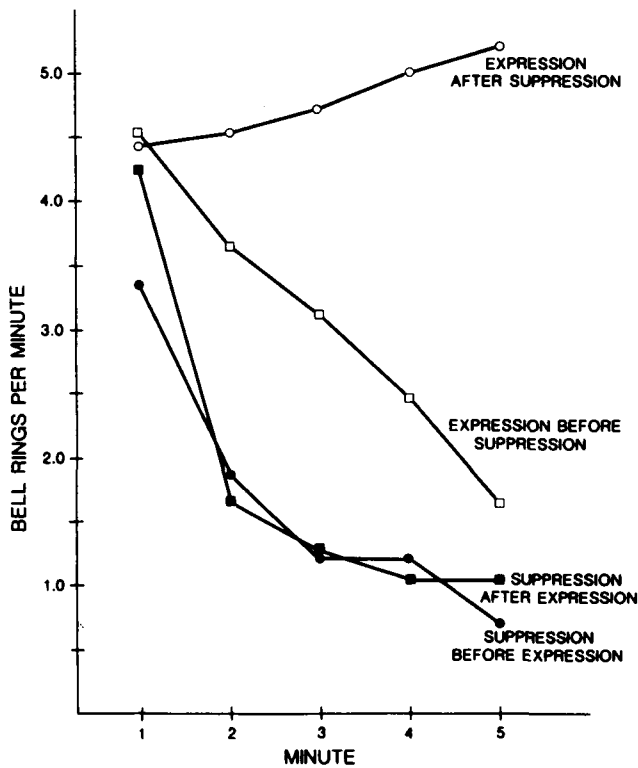


Figure 1. Bell rings per min over the 5-min periods.

tions and bell rings typically occurred in the context of subjects' meaningful narratives about white bears.

The observed effects have been examined in subsequent studies varying several parameters of the experimental design. In one such investigation, Shackelford, Wegner, and Schneider (1987) arranged for three groups of 10 subjects each to participate in experimental conditions like those of the initial suppression group in this study. One group participated in an exact replication, whereas the other groups participated with either (a) no bell, and verbalization serving as the thought measure, or (b) no verbalization required, and the bell alone serving as the thought measure. The different metrics used in these groups make mean comparisons between groups problematic, but the zero-order correlation between thought tokens measured during suppression and subsequent expression was replicated for all groups (each $r < .07$). These findings thus cast doubt on the possibility that the bell-ringing requirement in the original study had any special influence on the occurrence of the rebound effect.

One other follow-up study by Carter, Wegner, and Schneider (1987) is worth noting in that it showed what may be an important limiting condition for the finding that people have trouble suppressing thoughts. In this research, the tendency to report thinking of the to-be-suppressed thought during the suppression period was reliably reduced when subjects were given no chance to practice verbalizing the stream of consciousness before they began the suppression task. It may be that subjects must be comfortable making such reports before they will admit to suppression difficulty, or perhaps the initial reporting

helps people set aside their immediate concerns in the setting and get involved in the experimental task.

Discussion

The paradoxical effect of thought suppression is that it produces a preoccupation with the suppressed thought. These findings suggest that the task of suppressing a thought is itself difficult, leading people to hold the thought in consciousness repeatedly even as they try to eliminate it. When they are then released from the suppression task and asked instead to go ahead and express the thought, they do so at an accelerated rate, mentioning it more often than if they had simply been asked to express the thought from the start. There are thus both immediate and delayed tendencies toward conscious preoccupation with the very thought that is being suppressed.

Potential explanations for these two effects can be derived from several psychological theories. As noted earlier, psychoanalytic theory is not clear regarding the process or consequence of conscious suppression, and although some ideas might be gleaned from the Freudian version of unconscious repression, they are not strictly applicable to the present case. This is particularly true given the nature of the thought that subjects were asked to suppress in this study. Psychoanalytic interpretations are commonly extended only to cases of the forgetting or avoidance of threatening or stressful thoughts (Holmes, 1974), and white bears are generally nonthreatening this side of the Arctic Circle.

It may be possible to assimilate these findings to the theory of psychological reactance (Brehm, 1966). Because the person in the rebound period is doing the opposite of what the experimenter requested in the suppression period, one might argue that reactance was aroused by the suppression task. By this logic, the experimenter's instruction to avoid thinking of a white bear restricted the subject's freedom to do so, and this restriction made the thought more attractive. Thus, the subject tends to dwell on the thought in the suppression period, and once given the freedom to return to the thought in the expression period, becomes preoccupied with it.

The difficulty with this interpretation comes when we try to understand why a negative injunction should create more reactance than a positive one. After all, the subjects in the initial expression condition also had their freedom restricted; they were told to think of a white bear. Reactance predicts that they would avoid thinking of a white bear during the expression period, as they did (as compared with subjects in the expression period of the initial suppression condition). But it would also predict that initial expression subjects would be motivated to avoid the thought during the subsequent suppression period and would do so more than the subjects in the initial suppression condition. Such an effect should be of roughly the same magnitude as the rebound phenomenon observed in the initial suppression condition. This did not happen, and the reactance explanation thus falls short of a full explication of these findings.

Another framework that could be applied here is self-perception theory (Bem, 1972). This theory does not seem relevant to the initial difficulty people have in suppressing thoughts, but it does offer a prediction in line with some of the rebound evi-

dence. The theory says that a person who performs a behavior in the presence of external constraints will perform that behavior more often later when the constraints are removed. The experimenter's request to suppress thoughts of a white bear is indeed an external constraint, and because people find themselves thinking of white bears despite this constraint, they might develop a self-perceived positive attitude toward the activity of thinking of white bears. This idea also predicts, however, that people would think about a white bear in the subsequent expression period to the degree that they had disobeyed the external constraint and thought about a white bear in the prior suppression period. This was not the case, as a zero-order correlation was observed between thought frequencies in the two periods among initial suppression subjects. So self-perception theory fails to capture an important facet of these data.

The proper explanation of the thought-suppression effects appears to require the development of some new theoretical ideas. We have devised a framework consistent with several key features of the observed effects, and we provide one test of this framework in the following study.

Experiment 2

The results of the first experiment may be understood through an analysis of the process of self-distraction. Essentially, the individual who is faced with the task of suppressing a thought is given a negative cue for subsequent thinking, an instruction of what to avoid rather than an instruction of what to approach. This means that there is no single item for attention; there is, for instance, no one such thing as *not white bear*. This general idea can be helpful for understanding both the initial difficulty of suppression and the source of the subsequent rebound.

Suppression is difficult because thinking without focus is difficult. The person engaging in self-distraction turns to thoughts of many things. The person's attention may range over a wide expanse of mental territory, but in considering such items the person may find little that is quickly absorbing and that suggests a new line of thought. For example, a person using *white bear* as a negative cue might say, "I'll think about the light switch instead." The light switch is the focal point for a moment, but it turns out on examination to be less than intriguing. The person's attention may drift to something else, or perhaps more commonly, the person consults in memory the most recently occurring definition of the task at hand—in effect, asking "What am I doing?" When this happens, of course, the person is often reminded of a white bear and must begin again. This circular process may underlie the difficulty of self-distraction. Using a negative cue for thought tends to distract the person from the current mental task toward anything else, and the person who has so much of nothing in particular to consider then consults memory about what should be done to find a reminder and thus begin again.

Although the negative cuing task does not produce effective suppression, it is effective in producing another important cognitive change. All the things the person is thinking about during this task become associated with the negative cue. That is, the person comes to see present stimuli (e.g., the room, experimenter, etc.) as well as thoughts retrieved from memory as re-

lated to the negative cue. These things are *not white bears*. Such a connection to all ongoing thoughts is not produced by the complementary instruction to think of a white bear, however, because the person given this positive cue is likely to explore only a limited range of possible thought topics: those directly relevant to white bears. During expression, subjects talk of zoos, the North Pole, big black noses, and the like. Thinking about a white bear can be carried out successfully merely by rehearsing ideas found in memory that are already associatively linked to white bears. And indeed, thinking about other items in the room or entertaining other ongoing thoughts during expression would probably be identified by the subject as a failure to persevere at the experimental task. Negative cuing, in this light, brings many more new topics of thought into the class of things that are contrasted with (and thereby linked associatively to) the thought to be suppressed than does a process of simple concentration or directed thinking.

Negatively cued associations are not likely to be very strong, however, and may not be sufficient to remind the person of white bears very frequently (cf. Semin & Rosch, 1981). Because the person is not consciously trying to learn this association, an implicit rather than an explicit association is formed (Graf & Schacter, 1985). Later, however, when the injunction to avoid white-bear thoughts is lifted and the person is invited to think of white bears, the prior negative-cuing facilitates the task of continuing to think about white bears. Everything in the room, and in recent memory, is now imbued with a slight degree of *not white beariness*, and thoughts of white bears are thus implicitly primed by many ongoing conscious thoughts. The negative-cuing explanation of thought-suppression effects, in sum, indicates that the task of stopping a thought has the effect of producing associations of that thought with many other thoughts immediately available to the person, and that these associations function to make the thought rebound when the injunction to avoid the thought is no longer in effect.

The negative-cuing interpretation of thought suppression provides some further predictions on the nature of suppression effects. It suggests, for instance, that rebound effects should be largely eliminated if the person uses a positive cue for self-distraction during suppression. The attempt to think of just one replacement for the avoided thought rather than many might not keep the person deeply interested, and so might not reduce the initial difficulty of suppression—but it could very well short-circuit the rebound. With a single distracter for the to-be-suppressed thought, the person would not later be reminded of the thought by many other cues and so would not be as likely to become preoccupied with it during the expression period. This idea was tested in this experiment.

Method

Subjects. Undergraduates from Trinity University and from San Antonio College (16 men and 38 women) volunteered to participate, with the Trinity students receiving extra credit in introductory psychology classes for their participation. Tape recordings for 5 subjects were not clearly audible and their data were not included.

Design and procedure. The subjects were randomly assigned to three experimental conditions. Two of these were exact replications of the initial expression and initial suppression conditions of Experiment 1. The third was identical to the initial suppression condition with one

Table 2
Experiment 2: Measures of Thought by Group and Period

Group	Period	
	Suppression	Expression
Thought occurrence		
Initial expression	4.13 _a	15.47 _b
Initial suppression	9.17 _a	34.05 _{bc}
Focused distraction	5.94	21.00 _c
Thought duration		
Initial expression	9.07	64.87
Initial suppression	7.71	115.53
Focused distraction	9.24	65.18

Note. Means with a common subscript are significantly different by a Newman-Keuls test, $p < .05$. For initial expression, $n = 15$; for the other groups, $n = 17$ each.

exception: Subjects in this *focused distraction* condition were asked to distract themselves during initial suppression by means of a single positive cue, the thought of a red Volkswagen. They were told after the suppression instruction, "Also, if you do happen to think of a white bear, please try to think of a red Volkswagen instead." No further mention of the red Volkswagen was made during the remainder of the experiment for these subjects.

Results

Analysis of the tape recordings was made for the same variables examined in the first study (bell rings occurring with mentions of a white bear, bell rings occurring alone, and mentions occurring alone), and in addition for (a) duration in seconds of discussion about a white bear, (b) mentions of a red Volkswagen, and (c) duration in seconds of discussion of a red Volkswagen. Intercoder reliability between a pair of coders averaged .96 for the thought-occurrence measures (i.e., bells and mentions) and .86 for the thought-duration measures.

An initial attempt was made to use repeated measures ANOVAs paralleling those of Experiment 1. In that study, we were able to solve the problem of significant heterogeneity of error variance in such analyses by the use of a square root data transformation. The same transformation did not achieve homogeneity of error variance in this experiment, and all repeated measures analyses were therefore disallowed. With the square root transformation, however, homogeneity was obtained in three-group between-subjects ANOVAs, and these were thus conducted for each of two thought measures: an overall measure of thought occurrence and the measure of thought duration. Table 2 shows raw scores for mean number of thought occurrences (sum of bell rings, mentions of a white bear, and bells with simultaneous mentions) and the mean thought duration in the suppression and expression periods for each group.

Suppression period. As in Experiment 1, subjects in this study found suppression difficult. Across all conditions, subjects indicated thinking of a white bear 6.15 times in the 5-min suppression period. Subjects' preoccupation was significantly greater in the initial suppression group than in the initial ex-

pression group, overall $F(2, 46) = 4.54, p < .02$, with the Newman-Keuls comparison for this difference at $p < .05$. This did not occur in the prior study, and it is not clear why such a result appeared here. The overall tendency for white-bear thoughts to occur during suppression was not reliably reduced in the focused-distraction group. So, although these subjects mentioned red Volkswagens often ($M = 3.00$), they still kept thinking of a white bear during suppression at a rate equivalent to that of subjects in the other groups.

The thought-duration measure indicates that subjects across all conditions talked about a white bear for a mean of 8.65 s in the suppression period. Thus, it seems that the occurrences of the thought during suppression were relatively brief, averaging 1.41 s each. This duration is consistent with our observation in the prior study that thoughts of the item to be suppressed intrude on the verbal stream in only an abbreviated way during suppression. There was no significant variation in the duration of white-bear thoughts across conditions ($F < 1$). By this measure, then, suppression in the three groups was generally equivalent.

The mean duration of thought about a red Volkswagen in the focused-distraction condition was 20.76 s, the equivalent of 6.92 s per mention. This suggests that subjects in this condition took seriously their task of focusing on this distracter.

Expression period. Thought occurrence during expression (as shown in Table 2) was significantly influenced by group, $F(2, 46) = 4.62, p < .02$. Newman-Keuls comparisons indicated that the initial suppression group mean was reliably greater than the mean for the initial expression group, $p < .05$. Thus, the general finding of a rebound effect in Experiment 1 was replicated. (The temporal trends observed in that study, shown in Figure 1, were not tested here as the result of the heterogeneity of error-variance problem. Inspection of means suggested that the trend for increasing thought over time during expression in the initial suppression group was not as pronounced as in the prior study.) The mean level of thought occurrence during expression in the focused distraction group was significantly less than the comparable mean in the initial suppression group ($p < .05$). This indicates that the rebound effect for thought occurrences was reliably reduced in the focused-distraction group.

Thought duration during expression exhibited a marginally significant group effect, $F(2, 46) = 3.01, p < .06$. The differences between means reflected the same pattern as that observed for the thought-occurrence measure: The initial suppression group showed a tendency toward a rebound effect, in that its level during expression was elevated over that of the initial expression group; the focused-distraction group, in turn, showed a tendency for the rebound to disappear, in that its level during expression resembled that of the initial expression group.

Correlations within groups. As in the prior study, correlations were calculated between thought-occurrence scores for subjects in the expression and suppression periods. These correlations revealed a pattern of individual variation consistent with the prior study. Subjects' inclination to note thought occurrences was significantly correlated between the expression and suppression periods for subjects in the initial expression group ($r = .50, p < .02$). This correlation was nonsignificant in the initial suppression group ($r = .23, p > .18$). Although these correlations are not reliably different, their relative magnitudes

replicate the pattern observed in Experiment 1 and reveal a tendency toward rebound only under conditions of initial suppression.

By this correlational measure of the rebound effect, focused distraction eliminated the rebound. The correlation between thought occurrences in the suppression and expression periods for subjects performing the focused distraction was significant ($r = .55, p < .02$). Thus, the usual tendency for thought-occurrence measures to be correlated was found here even when subjects engaged in suppression before expression. Apparently, the technique of turning to one distracter—in this case, the red Volkswagen—is sufficient to eradicate this indication of a suppression-induced rebound in thought. Parallel correlational analyses that were conducted with the duration measures exhibited a similar pattern but no significant correlations in any condition.

Among subjects in the focused-distraction group during suppression, mentioning a red Volkswagen tended to be correlated with indications of white-bear thought occurrence ($r = .41, p < .06$). A partial correlation taking into account the relation between white-bear thought occurrences in the suppression and expression conditions showed that mentioning a red Volkswagen during suppression was not reliably related to the level of white-bear thought occurrence during subsequent expression (partial $r = .33, ns$). The negative-cuing hypothesis predicts a negative correlation here, but it is difficult to discern whether this finding represents an anomaly for the hypothesis or an effect of insufficient within-group sample size for statistical inference.

Discussion

The results of this study are consistent with those of Experiment 1 in suggesting that suppression is difficult and that it has reliable effects on subsequent thinking. The ability of subjects to suppress the thought of a white bear was not in strong evidence here, as subjects tended to note the thought's occurrence more than once a minute even as they were attempting to suppress it. This was true also among subjects given a focused distraction, the instruction to think of a red Volkswagen whenever a white bear came to mind.

The rebound phenomenon observed in Experiment 1 was found in this study as well. Subjects who initially suppressed the white-bear thought and then were allowed to express it showed an elevated tendency to report its occurrence during their expression opportunity. Subjects in this initial suppression group, as it happened, also exhibited a significant elevation in their degree of thought occurrence during suppression relative to the other groups, and this finding raises the possibility that subjects in this group were merely more inclined to report thought occurrences than were subjects in the other groups. The measure of thought duration, however, showed no such pattern, indicating instead a relative but nonsignificant lack of concern with the white bear during suppression for initial suppression subjects. Yet, by this measure, a marginally significant tendency toward a rebound was observed in the initial suppression group during the expression period. In addition, the correlation pattern between thought occurrences in the initial suppression and initial expression groups paralleled the pattern of Experiment

1. On balance, then, it can be concluded that general trends of the first study were replicated in this one.

The negative-cuing hypothesis devised to account for the observations of the first study was tested here. This account holds that subjects in a focused-distraction group might defeat a recurrent inclination to think about anything other than white bear by focusing on the single distracter provided them. This should, in turn, reduce the degree to which (negatively cued) associations are formed between the white bear and other current thoughts and so reduce the likelihood that subsequent continuations of these current thoughts would prime the idea of the white bear during the later expression period. As predicted by this hypothesis, focused distraction during suppression in this experiment produced a significant attenuation of the rebound effect. Subjects in the condition receiving these special instructions exhibited patterns of thinking largely indistinguishable from those of subjects in the initial expression group and significantly different from those of subjects in the initial suppression group.

This is but a first outing for the negative-cuing hypothesis, of course, and further inquiry will be needed to determine whether it serves as an adequate account of the rebound phenomenon. The hypothesis also predicts, for example, that the rebound might be eliminated by dissociating the contexts in which suppression and expression are performed. People who try not to think about a white bear in one context would form negatively cued associations to a white bear only in that context. On moving to a different context, their constellation of ongoing thoughts would change, with far fewer thoughts now priming a white bear, and the rebound might be defeated. The relief from old worries one sometimes experiences on traveling to a new environment might be an example of this.

Focused distraction also has its everyday equivalents. More than one person has attempted to find comfort in the face of unwanted thoughts by appealing to a single distracter, be it a bare light bulb, a religious icon, or perhaps even a red Volkswagen. The results of this study suggest that there may be a certain use in turning to a familiar talisman in the pursuit of mental peace. Although the distracter may not ease the current task of suppression, it could block negative cuing and so serve the welcome purpose of reducing later resurgence of the suppressed thought.

General Discussion

The results of these experiments suggest that the portrayal of suppression as the parent of obsession may contain a degree of truth. The process begins when a person attempts to put a particular thought out of mind. This need not be an especially obnoxious or unnerving thought—even the thought of a white bear will do. The person finds the thought hard to suppress and may soon wonder why this particular thought is so insistent. Continued suppression may eventually remove the thought from mind, for the present. Then, however, some reminder occurs, and in a moment of weakness the person gives license to the rumination. Our results suggest that in this moment, an unusual preoccupation with the formerly suppressed thought may begin. This preoccupation may grow and prosper in the person's mind. And quite ironically, the person who is first most

successful in carrying out the suppression may eventually be most susceptible to the resulting obsession.

The momentum imparted to thought by an act of suppression has long been known, or at least suspected, in many quarters of psychology. The idea that there is danger in keeping things bottled up inside has surfaced in a variety of forms. Lindemann (1944), for example, suggested that grieving follows this rule; he argued that suppression can produce an insufficient amount of grief work and so can impair coping by the bereaved. Similar formulations promote emotional catharsis of many sorts, from letting out aggressive impulses to working through pent-up feelings in relationships. Such an antisuppression model appears to be an exaggerated generalization of psychoanalytic ideas (cf. Freud, 1914/1958), and although it is widely advocated in popular psychology channels, it has to date remained largely unformulated in psychological theory and unsupported in laboratory settings (e.g., Geen & Quanty, 1977).

This picture of neglect and negative evidence is now changing, however, suggesting the beginnings of a new psychology of suppression. The work of Pennebaker (1985) is notable in this regard, showing in several field investigations that the suppression or inhibition of emotional and cognitive reactions to traumatic events may yield physiological changes and subsequent health problems. A related line of inquiry by Silver, Boon, and Stones (1983) suggests that suppression may block a natural tendency to find meaning in traumatic events and that this can hamper effective coping processes. These investigations focus on individuals responding *in vivo* to profound traumas, and although Pennebaker reported some success in the laboratory simulation of certain key aspects of this process, it is still true that phenomena observed in vivid field demonstrations remain elusive in controlled settings. This may be one way in which the laboratory paradigm can contribute. Our findings support the general idea that suppression can backfire, and at the same time, the results make this point without recourse to the major emotional traumas usually associated with such effects (cf. Rachman, 1980). The suppression results we have observed suggest a straightforward cognitive mechanism mirroring, and perhaps underlying, a wide array of psychological phenomena: emotional, cognitive, and behavioral as well.

It is yet an open question, of course, whether the suppression effects we have observed will generalize to items other than white bears. The nature of the thought being suppressed—whether it is emotional or not, easily imagined or not, familiar or not, complex or not, and the like—would seem to be an important determinant of suppression effects. The finding that an item as unremarkable as a white bear can yield suppression problems, however, suggests that the effects are at least not tied to any obvious stimulus qualities. Other points of concern for the validity of these findings center on the degree to which the observed effects might be dependent on the imposition of the trappings of the laboratory on subjects' thought processes. Whether people do attempt by themselves to stop thinking (without our instruction to do so) and whether they then experience difficulty (when they are not being asked to verbalize or give another signal of their thought) at this point must remain unresolved issues. We can only remark on the many striking resemblances between the observed effects and the everyday observations people make about the tenacity of their worries, ad-

dictions, crushes, and obsessions (see, e.g., Rachman & de Silva, 1978).

The observed processes, though fairly tame in the laboratory, might conceivably create powerful mental preoccupations in natural settings. This is because, in daily life, suppression attempts and subsequent rebounds of thinking could occur repeatedly, escalating in response to each other, and so yield dramatically magnified effects. A person might begin, perhaps only on a whim, to suppress a certain thought. The suppression process might be difficult, but the person could probably arrive at successful suppression in a relatively brief period. Later on, however, some trigger for the rebound occurs and the person becomes involved in an excessive level of rumination. It is at this point that the person becomes alarmed, noticing that an unusual degree of preoccupation is underway. This might produce a newly energized attempt at suppression, only to restart the cycle. Suppression might be yet more difficult at this time, but it could seem to be the only solution. Eventually, pathological levels of obsessive concern could result. A similar analysis might be made of the processes of addiction. Attempts to control a habit such as smoking could take the form of thought suppression, and these in turn could prompt rebounds of excessive attention to the act of smoking. Cycles of suppression and preoccupation might then be standard fare for people who attempt to control an addiction in this way, resulting in repetitive abstinence and relapse.

On the practical side, then, perhaps it is fortunate that our findings signal at least one possibility for relief from the ironic complications of thought suppression. Quite simply, it appears that when suppression is transformed into an active interest in a single distracter, the longer term dangers of a rebounding preoccupation with the suppressed thought may be prevented. Returning to a particular idea whenever one worries might provide some reduction in the eventual extent of the worrying. This procedure might prove to be of some use in the elimination of obsessional thinking or addictive preoccupation. To be sure, however, the dimensions of this effect are only incompletely grasped at this time, and the form of an adequate theory of successful suppression is not imaginable yet. Much more needs to be learned about the parameters of the paradoxical effects we have observed before we can suggest with any confidence that they offer a proper analog of naturally occurring processes. In the meantime, though, it seems clear that there is little to be gained in trying not to think about it.

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