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Chapter 8

Intentional Forgetting and Voluntary Thought Suppression: Two Potential Methods for Coping With Childhood Trauma

Wilma Koutstaal, Ph.D., and Daniel L. Schacter, Ph.D.

My strongest asset through all my experiences was my ability to "block out" whatever I didn't want to remember. If I didn't talk about them, or even think about them, I was able to survive.

Anonymous incest victim (Silver et al. 1983, p. 97)

Extreme trauma often evokes equally extreme responses. In the effort to cope, and faced with a life-threatening or world-view shattering traumatic event, an individual may find herself or himself vulnerable to radical alterations in cognitive, emotional, and neurophysiological responses. Posttraumatic stress disorder (PTSD) (e.g., Krystal et al. 1995), psychogenic amnesia (e.g., Schacter et al. 1982), fugue states (e.g., Eisen 1989), and dissociative identity disorder (e.g., Putnam 1993; Schacter et al. 1989) are among such responses. Yet not all individuals respond to trauma with such "extreme" coping mechanisms, nor are all sources of trauma immediately and consistently identified as such. Some forms of trauma, including childhood sexual abuse, may assume a more chronic, ambiguous, and intermittent course, interspersed with periods of comparative normality (see Conte et al. 1989; Trickett and Putnam 1993). What forms of coping might a child attempt to draw on in dealing with such abuse? If abuse is (for the moment) not occurring, and the individual is "expected" to continue with social, familial, and other roles and responsibilities as if nothing had happened, how might the individual attempt to manage thoughts and memory of the abuse?

In this chapter, we specifically focus on two less extreme responses—intentional forgetting and voluntary thought suppression—that represent more commonplace, but potentially important, possible responses to abuse. Although clear evidence supports the role of pro-

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cesses similar to intentional forgetting and thought suppression in cases of both childhood sexual abuse and adult trauma (and we begin by reviewing some of this evidence), we also attempt to address a further question. What evidence is available from empirical laboratory research that would help us determine when such strategies might or might not prove successful?

We do not assume that intentional forgetting and thought suppression are the only, or even the most important, methods used in coping with sexual abuse or other forms of trauma (although this may be true for some individuals). Equally important, we do not assume that there is evidence for a form of massive and unconscious repression of trauma, in which individuals allegedly become entirely amnesic for repeated or prolonged periods of severe abuse. There is little evidence for such massive repression (see Holmes 1990; Loftus 1993; Ofshe and Singer 1994; Pope and Hudson 1995), and instances of broadly encompassing amnesia may be more likely to involve dissociative pathology than unconscious “repression” (for discussion, see Schacter 1996; Schacter et al., in press; Spiegel 1995). Rather, we are specifically concerned with deliberate and conscious efforts to curtail one’s thoughts and memories. We ask: 1) Is there evidence or reason to believe that intentional forgetting and thought suppression are sometimes used (either alone or as a supplement to other methods) in coping with sexual abuse or other forms of trauma? and 2) What does research from laboratory paradigms reveal about the probable effects of these methods on later thinking and memory?

This chapter has four major sections. We begin by briefly reviewing several sources of evidence suggesting that intentional and conscious efforts to suppress one’s thoughts and memory of traumatic experiences are, indeed, sometimes used by individuals in attempting to cope with the trauma. In the main part of this chapter, we focus on the empirical literature regarding directed forgetting and thought suppression. In these sections, we assess evidence of the degree to which, and the conditions under which, intentional forgetting and voluntary thought suppression can produce their intended effects. We also provide an assessment of the processes believed to underlie successful intentional forgetting and thought suppression. In the final section, we attempt briefly to interrelate key findings from these two paradigms with clinical and other reports of trauma and suggest several questions that future research should examine.

**Evidence Regarding Conscious Efforts to Suppress or to Forget Trauma**

Evidence from several sources converges in suggesting that traumatic events—including childhood sexual abuse—may sometimes be fol-

owed by deliberate and conscious efforts to suppress thoughts and memories of the abuse. Three general sources of evidence supporting such efforts include:

1. Retrospective self-reports obtained during interviews or from questionnaires asking how individuals responded to childhood abuse or other forms of trauma
2. Observations reported by others after a traumatic event, indicating that traumatized individuals sought to avoid reminders or thoughts of the incident or actively denied that it had occurred
3. General background information about the conditions often surrounding revelations of childhood abuse

Excerpts from follow-up interviews recently reported by L. M. Williams (1995) with women who had a documented history of sexual abuse during childhood clearly implicate deliberate and intentional efforts not to think about the abuse as a potential contributor to poor recall of some abuse episodes. In an earlier study, L. M. Williams (1994) found that of 129 women with a documented incidence of abuse in childhood, 62% recalled the particular abuse episode that had occurred some 17 years earlier, which had resulted in their being brought to the attention of the investigators. However, additional questioning of these women revealed that not all of them had always remembered the abuse. Of the 75 women who recalled the abuse and who were also asked additional questions, 12 women (16%) reported that there was a time in their past when they had forgotten the abuse—in some cases, after a deliberate and purposeful effort to do so. One woman said, “I blocked it out right away, the first time it happened (age 12). I didn’t remember until it happened again—I was raped when I was 17” (p. 663). Two other women used the identical expression of “blocking it out” and further noted how, after a time, they specifically stopped thinking of the abuse: “I don’t know how old I was, I used to think about it for the first two years, then I just blocked it out. I may not have completely forgot, I just didn’t think about it” (p. 663). “Well, I guess I may not have completely forgotten it after my mother talked to me, but blocked it out most of the time, just stopped thinking about it” (p. 666).

These responses are remarkably similar to the efforts at suppression reported by adult rape victims (Burgess and Holmstrom 1979). Some adult victims reported that they attempted to dispel all memory of the rape from their minds through a deliberate and conscious effort. They did not like to be reminded of the rape ("Don’t refresh my mind to it") and spoke of being able to “block the thoughts” from their minds (Burgess and Holmstrom 1979, p. 1280). These responses are also similar to that of one woman, anonymously questioned by Silver et al. (1983), about how she had coped with father-daughter incest that had occurred
years earlier and who wrote: “My strongest asset through all my experiences was my ability to ‘block out’ whatever I didn’t want to remember. If I didn’t talk about them, or even think about them, I was able to survive” (p. 97).

There is also at least some evidence of denial of traumatic events during childhood, soon after those events occurred. For example, in their study of children’s memory for an invasive and painful medical procedure (involving urinary tract catheterization), Goodman et al. (1994, p. 288) reported that “a few” of the children from a sample of 46 denied that they had ever undergone the procedure. Likewise, a recently reported and corroborated case of recovered memory for an incident of childhood sexual abuse (Nash 1994) indicated at least behavioral denial of the event directly after it occurred.

Children may also actively avoid reminders associated with other forms of trauma. For example, Nader et al. (1990) found that 14 months after a sniper attack on a school playground, of all the children—including those who were on the playground, in the school, or away from the school on that day—66% reported avoidance of reminders of the attack. Of those who were on the playground itself during the attack, nearly 90% still reported avoidance of reminders. In the entire group, avoidance of reminders was the most common symptom still present at 14 months, and the next two most frequently occurring symptoms were fear when thinking of the event (48% of the entire group) and becoming upset by thoughts of the event (47%).

The need or desire to keep abuse secret, either absolutely, so that no one is ever told of the abuse, or selectively, so that only a few trusted others learn of it, may also encourage deliberate efforts at thought suppression and avoidance of reminders that might prompt memories and thoughts of the abuse (see Lane and Wegner 1995). In a national survey of childhood sexual abuse in adult men and women, Finkelhor et al. (1990) found that fewer than 50% of the men and women reporting abuse also reported that they had told anyone about it within a year of its occurrence. Of 169 men who reported a childhood sexual abuse experience, 42% reported that they had never told anyone of the abuse; likewise, of 416 women reporting abuse, 33% indicated that they had never told anyone.

In some cases of childhood abuse, the perpetrator or others who learn of the abuse may actively encourage thought suppression or forgetting by urging secrecy, telling the child that the event never happened, or refusing to discuss the incident (e.g., Adams-Tucker 1982; Browne and Finkelhor 1986; Everson et al. 1989). For example, researchers who have sought to determine the degree of maternal support offered to sexually abused children in clinical samples have found that relatively few mothers are supportive, with the proportion of mothers deemed supportive ranging between 25% and 56% (e.g., Adams-
mental work on voluntary thought suppression, influencing the likelihood that suppression will be successful or will lead to the exact opposite of the hoped-for result: greater rather than diminished preoccupation with the unwanted thought.

We next review findings from these two laboratory paradigms. In each case, we first examine basic outcome data on the degree to which the intended outcome (forgetting or reduced frequency of the unwanted thought) can be achieved and then consider possible mechanisms underlying those effects. We examine experiments using both emotionally neutral and emotionally significant materials; in addition, in the case of directed forgetting, we also briefly consider studies that investigated whether children can intentionally forget.

Intentional Forgetting

Can Adults Intentionally Forget Emotionally Neutral Materials?

Clear and consistent experimental evidence indicates that instructing an individual to forget something can subsequently result in diminished memory for that material compared with memory for information that was never subjected to an intention to forget (for reviews, see Bjork 1989; H. M. Johnson 1994). However, whether intentional forgetting will be successful depends on a variety of factors relating both to the conditions present during the encoding of the to-be-forgotten information and to the conditions under which retrieval is attempted.

One factor that has emerged as particularly important in determining the extent to which memory for the to-be-forgotten items is, indeed, impaired relative to memory for items that were designated as to-be-remembered concerns the manner in which the instruction to forget is given. Two methods of providing the instruction to forget have been most frequently explored by cognitive researchers in recent years. In one method, individuals are first presented an entire set or block of items under intentional learning conditions. They are then unexpectedly told that this information should be forgotten—usually under the guise that the first block of items were “practice” items. In this method—hereafter referred to as the “block-cuing” directed forgetting procedure—the instruction to forget is given only after subjects have already encountered and actively attempted to remember many stimuli. In contrast, in a second method, individuals are told at the outset that the experiment is concerned with how well people can selectively remember some information while forgetting other information. In this method—hereafter referred to as the “item-cuing” directed forgetting procedure—each stimulus item is designated either as to-be-remembered or as to-be-forgotten soon after it is presented (usually within a few seconds).

The second of these methods, in which some of the stimulus items are cued as to-be-forgotten soon after they are encountered, generally results in more forgetting than in the first method, in which the instruction to forget is postponed until after a larger set of items has been presented. Table 8-1 presents a comparison of the amount of forgetting observed on free- or cued-recall tests with the item-cuing versus block-cuing procedure. Results are shown for eight experiments or experimental conditions in which both of these cuing procedures were used within the same experimental design (Basden et al. 1993a, 1994; Koutstaal 1996). As can be seen in Table 8-1, both procedures resulted in greater recall of the remember-cued than the forget-cued items. However, the differences were consistently larger in the item-cuing than in the block-cuing procedure, resulting in an average difference of 27% for the item-cuing (range, 14%–45%) compared with only 12% for the block-cuing method (range, 6%–21%).

With the item-cuing procedure, forgetting is also generally found during recognition testing (e.g., Bjork and Geiselman 1978; Golding et al. 1994). In contrast, the strong retrieval cues provided by the recognition test items usually eliminate the disadvantage for the forget-cued

Table 8-1. Magnitude of directed forgetting on recall tests under item cuing and block cuing

<table>
<thead>
<tr>
<th>Experiment and type of test</th>
<th>Item cuing</th>
<th>Block cuing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rem</td>
<td>For</td>
</tr>
<tr>
<td>Basden et al. (1993a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 1 cued recall</td>
<td>.35</td>
<td>.14</td>
</tr>
<tr>
<td>Expt. 2 cued recall</td>
<td>.82</td>
<td>.59</td>
</tr>
<tr>
<td>Expt. 3 free recall</td>
<td>.50</td>
<td>.05</td>
</tr>
<tr>
<td>Expt. 4 free recall, short list</td>
<td>.25</td>
<td>.11</td>
</tr>
<tr>
<td>Expt. 4 free recall, long list</td>
<td>.23</td>
<td>.08</td>
</tr>
<tr>
<td>Basden et al. (1994)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 1 free recall</td>
<td>.53</td>
<td>.12</td>
</tr>
<tr>
<td>Koutstaal (1996)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 4 free recall</td>
<td>.37</td>
<td>.12</td>
</tr>
<tr>
<td>Expt. 5 free recall</td>
<td>.42</td>
<td>.07</td>
</tr>
<tr>
<td>Average directed forgetting effect</td>
<td>.27</td>
<td></td>
</tr>
</tbody>
</table>

Note. All results are for the first test administered only. Rem = remember cued; For = forget cued; Diff = difference in remember-cued and forget-cued performance (Rem − For).
items under block cuing (e.g., Basden et al. 1993a, 1994; Geiselman et al. 1983; Koutstaal 1996, Experiments 3 and 4). Table 8-2 presents the outcome of 12 experiments that used the item-cuing method, in which subjects were tested by using recognition, and in which recognition was the first test administered. In these experiments, the average directed forgetting effect was 18% (range, 7%–35%). In contrast, a set of 8 experiments that used the block-cuing method yielded an average directed forgetting effect of only 2% (range, –2%–9%).

Do these differences in memory performance for the to-be-remembered versus the to-be-forgotten items arise from impaired memory for the forget-cued items? Or do they primarily reflect enhanced memory for the remember-cued items? As will be seen, comparisons of the data provided in Tables 8-1 and 8-2 as well as other sources of evidence suggest that the answer to this question depends on the method that is employed. Whereas the differences found in the item-cuing procedure may primarily result from preferentially thinking about and elaborating on the remember-cued items, this account does not seem to apply as well to the forgetting observed in the block-cuing procedure. With block cuing, the to-be-forgotten items may be less readily retrieved from memory despite having been initially processed and encoded to the same degree as the to-be-remembered items. However, further discussion of the possible processes underlying directed forgetting will be postponed until evidence regarding forgetting of emotionally significant materials and directed forgetting in children has been examined. At this point, however, we can draw five conclusions from the above discussion and from the data provided in Tables 8-1 and 8-2 concerning the forgetting of emotionally neutral material:

1. There is clear evidence that the intention to forget certain experimentally presented materials can lead to reduced memory performance for those items compared with stimuli that were not subjected to an intention to forget.

2. Under conditions of relatively little retrieval support (such as during free-recall or cued-recall testing), the decrease in memory for the forget-cued items has been observed both when individual items are cued as to-be-forgotten soon after their presentation (item cuing) and when the instruction to forget is given only after several stimuli have already been actively processed (block cuing).

3. Under conditions of greater retrieval support (such as recognition testing), the decrease in memory for the forget-cued items has most often been seen only under item cuing and not with block cuing.

4. Despite the presence of sometimes quite substantial differences in memory performance for the to-be-remembered and to-be-forgotten items, some of the to-be-forgotten items are still recalled and recognized. For example, the average level of recall for the forget-cued items in Table 8-1 was 16% under item cuing and 27% under block cuing; likewise, the average level of recognition for the forget-cued items in Table 8-2 was 65% under item cuing. Thus, directed forgetting seems to involve a relative rather than absolute phenomenon.

5. The directed forgetting effects obtained with item cuing tend to be greater than those found with block cuing and are also greater under free- or cued-recall test conditions than under recognition testing. The latter observation is important because it partially addresses the concern that directed forgetting effects are simply due to voluntary response withholding—that is, a failure to report information about the to-be-forgotten items even though that information is, in fact, remembered. If individuals were merely fail-

Table 8-2. Magnitude of directed forgetting on recognition tests under item cuing and block cuing.

<table>
<thead>
<tr>
<th>Experiment and condition</th>
<th>Item cuing</th>
<th>Block cuing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rem For Diff</td>
<td>Rem For Diff</td>
</tr>
<tr>
<td>Basden et al. (1993a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 1</td>
<td>.88 .77 .11</td>
<td>.92 .89 .03</td>
</tr>
<tr>
<td>Expt. 2</td>
<td>.92 .77 .15</td>
<td>.90 .89 .01</td>
</tr>
<tr>
<td>Expt. 4, short list</td>
<td>.81 .67 .14</td>
<td>.86 .88 .02</td>
</tr>
<tr>
<td>Expt. 4, long list</td>
<td>.75 .59 .16</td>
<td>.76 .74 .02</td>
</tr>
<tr>
<td>Basden et al. (1994)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 1</td>
<td>.86 .67 .19</td>
<td>.89 .83 .06</td>
</tr>
<tr>
<td>Koutstaal (1996)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 1</td>
<td>.86 .67 .19</td>
<td></td>
</tr>
<tr>
<td>Expt. 2</td>
<td>.94 .87 .07</td>
<td></td>
</tr>
<tr>
<td>Expt. 3</td>
<td></td>
<td>.98 .97 .01</td>
</tr>
<tr>
<td>Expt. 4</td>
<td>.89 .70 .19</td>
<td>.85 .86 .01</td>
</tr>
<tr>
<td>Expt. 5</td>
<td>.93 .58 .35</td>
<td>.87 .78 .09</td>
</tr>
<tr>
<td>Gardiner et al. (1994)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short cu delay</td>
<td>.68 .43 .25</td>
<td></td>
</tr>
<tr>
<td>Long cu delay</td>
<td>.67 .55 .12</td>
<td></td>
</tr>
<tr>
<td>MacLeod (1989)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expt. 1, immediate test</td>
<td>.76 .55 .21</td>
<td></td>
</tr>
<tr>
<td>Average directed</td>
<td>.18 .02</td>
<td></td>
</tr>
</tbody>
</table>

Note. All results are for the first test administered only. Dashes indicate that the relevant procedure (item cuing or block cuing) was not included in a particular experiment and condition.

Rem = remember cued; For = forget cued; Diff = difference in remember-cued and forget-cued performance (Rem – For).
Can Adults Intentionally Forget Emotional or Traumatic Stimuli?

The findings concerning intentional forgetting of emotional materials are somewhat mixed but, on the whole, indicate that forgetting can also occur for emotionally significant materials, at least under some circumstances. Two studies have specifically reported failures to forget emotionally negative materials or a failure to forget either emotionally negative or emotionally positive materials. In one study (Geiselman and Panting, 1985, Experiment 2), undergraduate students were presented a list of words, one-half of which were judged to be positive in meaning (e.g., clown, butterfly, love) and one-half of which were judged to be negative in meaning (e.g., garbage, disease, dirt). The item-cuing method was used, with the positive and negative words presented in intermixed fashion for 3 seconds each, and immediately followed by an instruction either to remember or to forget (also for 3 seconds). Analyses of subjects’ free-recall responses revealed a significant interaction of cue type with word affect, indicating that for the remember-cued items, positive words were significantly more likely to be recalled (mean, 64%) than negative words (mean, 43%), but the reverse was true for the forget-cued items; when given an instruction to forget, negative words were significantly more likely to be recalled (mean, 31%) than were positive words (mean, 16%).

More recently, Ochsner and Schacter (unpublished observations, February 1996) used a modified block-cuing procedure to determine whether recollection of emotionally charged photographs could be affected by intentional forgetting. Subjects were instructed to either remember or forget six-item blocks of photographs that depicted scenes and objects with neutral emotional content (e.g., a rolling pin or an office scene), positive content (e.g., a happy family), or negative content (e.g., a mutilated limb). All items in a given block were of the same emotional valence. On a subsequent recognition test, when subjects indicated that an item was old (i.e., was previously presented in the experiment), they were asked to indicate whether they could also “recollect” particular details regarding the photograph’s prior occurrence, such as its appearance or their reaction to it, or whether they simply “knew” that the item had been previously presented, without being able to recollect any specific episodic details about it. (For a general review of this procedure, known as the remember/know distinction but here referred to as recollect/know so as to avoid confusion with the instruction cue, which is also designated as remember, see Gardiner and Java 1993.) The key finding was that directed forgetting affected only memory for neutral items. In general, negative photographs produced the most, and neutral photographs the fewest, recollections, but when subjects were instructed to forget, recollections of negative and positive items were unchanged, whereas recollections of neutral items were reduced by 40%.

This study suggests that, under certain conditions, both positive and negative emotional information may be resistant to conscious attempts to forget. However, three other studies have yielded either more mixed conclusions or evidence of successful forgetting of emotionally significant materials. Using the block-cued directed forgetting procedure, Myers et al. (1992) found no effect of emotional valence on the recall of words. In this study, a manipulation of the valence of the words (positive, negative, or neutral) was combined with another individual differences factor: gender. The subjects (female undergraduate students) were classified on the basis of their performance on the Marlowe-Crowne Social Desirability Scale (Crowne and Marlowe 1964) and the short version of the Taylor Manifest Anxiety Scale (Taylor 1953) into four groups: 1) repressors (high defensiveness and low anxiety, n = 15), 2) low anxiously (low defensiveness and high anxiety, n = 15), 3) high anxious (low defensiveness and high anxiety, n = 12), and 4) defensive high anxious (high defensiveness and high anxiety, n = 12) (for the original development of this classification scheme, see Weinberger et al. 1979). Two blocks of items, each composed of six positive, six negative, and six neutral words, were presented. Subjects were required to rate each of the words for pleasantness and then were told, after the first block, that those items were for practice and could be forgotten. Averaging across the groups, there was significant directed forgetting (average recall of to-be-remembered items, 32%; average recall of to-be-forgotten items, 19%). However, there was no interaction of group with instruction cue, indicating that the magnitude of the directed forgetting effect was similar for all four subject groups. Also, although there were too few observations for the differently valenced words to be analyzed separately, examination of the mean number of to-be-forgotten words that were recalled showed no evidence that negative words were either more or less likely to be forgotten than positive or neutral words (average recall of to-be-forgotten negative, positive, and neutral words of 9%, 7%, and 3%, respectively; average recall of to-be-remembered negative, positive, and neutral words of 11%, 13%, and 8%, respectively).

Using a quite different procedure, in which individuals were administered shocks for retrieving to-be-forgotten items, Weiner (1968, Ex-
Experiments 6, 7, and 8) found that individuals were modestly but significantly less likely to retrieve information when they knew they would be shocked for doing so (average recall across three experiments, 55%) than when no shock would follow on retrieval (average recall, 60%). Although the investigators attempted to ensure that these differences were not simply due to voluntary response withholding, this alternative cannot be definitively ruled out.

The most directly relevant study to address the issue of directed forgetting and trauma arising from childhood sexual abuse is that of McNally et al. (unpublished observations, February 1996). These investigators used the item-cuing procedure to examine the extent to which women who had been sexually abused as children could selectively remember or forget trauma-related words (e.g., molested, scream), positive words (e.g., healthy, secure), and neutral words (e.g., curtain, desk). Performance was examined separately for those women who had a current diagnosis of PTSD (n = 14) and those who did not currently have PTSD (n = 12). The words (10 from each category) were presented in intermixed fashion, with each word presented for 2 seconds, followed by the instruction cue to remember or to forget for 3 seconds. All subjects were tested first on free recall, then on cued recall (the recall cues consisted of the first three letters of each word), and finally on a yes/no recognition test (composed of the 30 studied items and 30 new nonstudied distractor items, with the distractor items also being drawn from the trauma-related, positive, and neutral categories).

In the PTSD participants, although memory for the trauma-related words was greater with an instruction to remember (38%) than with an instruction to forget (26%), the overall level of recall of the trauma-related words (32%) significantly exceeded that for the positive and neutral words (mean, 15%), which were entirely unaffected by the instruction cue (mean for remember cue, 15%; mean for forget cue, 15%). PTSD participants recalled significantly fewer positive to-be-remembered words (11%) and significantly fewer neutral to-be-remembered words (19%) than did control participants (29% and 45%, respectively). In contrast, the non-PTSD participants recalled a similar number of trauma-related and non-trauma-related words overall and had better memory for the to-be-remembered items than for the to-be-forgotten items, regardless of the valence of the words (to-be-remembered recall for trauma-related, positive, and neutral words of 33%, 29%, and 45%, respectively; to-be-forgotten recall for the same categories, respectively, of 23%, 15%, and 20%). A very similar pattern was found in cued recall. The PTSD participants tended to recall more of the trauma-related words (64% remember; 48% forget) than the neutral or positive words (average, 28%), and this trend was largely unaffected by the instruction, whereas the non-PTSD control subjects showed overall directed forgetting. On the recognition test, PTSD participants recognized significantly fewer of the to-be-remembered words than did the control subjects; also, whereas PTSD participants showed no overall directed forgetting in recognition, the non-PTSD control subjects again showed directed forgetting.

On the one hand, considering the participants with PTSD, this study indicates a failure of selective forgetting of trauma-related material: these participants tended to remember trauma-related words that they were supposed to forget and failed to remember non-trauma-related words that they were supposed to remember. On the other hand, considering the participants who did not have PTSD, this study also suggests that successful intentional forgetting of trauma-related material is possible. Despite having a history of childhood abuse, the non-PTSD participants were able to selectively remember and to forget, with that ability manifested for both the trauma-related items and non-trauma-related items.

Extrapolation of these findings to settings outside the laboratory must be done cautiously. The ability to selectively remember or forget the presentation of single word cues in an experimental setting—even words semantically associated with a form of trauma that an individual experienced—is clearly not equivalent to the ability to remember or forget the trauma itself or even the environmental and other cues actually associated with the trauma. Furthermore, in themselves, these results cannot explain why PTSD participants were less able to forget trauma-related words than were their non-PTSD counterparts who had also endured childhood abuse. For example, did PTSD participants have more extensive and more strongly activated general schemata for abuse, thus making it both more difficult to forget the trauma-related words and more difficult to remember the non-trauma-related words? Nonetheless, these results suggest that the effectiveness of intentional forgetting of abusive episodes might be moderated by factors relating to the psychological status of the individual at the time. Voluntary forgetting of trauma-related materials may not be possible for some individuals (e.g., those with PTSD) but may be possible for others (e.g., those without PTSD). Other factors, possibly correlated with the presence or absence of PTSD, such as the severity or nature of the abuse, may, of course, also be important.

Can Children Show Intentional Forgetting?

Is intentional forgetting possible for young children? Because many incidents of abuse occur during childhood, this question is clearly important.

Four studies have examined children's ability to forget neutral materials (Bray et al. 1983, 1985; Harnishfeger and Pope 1996; Howard and
Goldin 1979), and each demonstrated that children may—under certain conditions—be able to successfully attend to, and remember, relevant rather than irrelevant information. However, if the information is designated as to-be-forgotten only after the child has already encountered it, then younger children (kindergarten children; 7-year-olds; and, to a lesser degree, 9-year-olds) prove largely unable to selectively forget.

Three of these studies used a somewhat different directed forgetting procedure, in which each child was presented with several trials, but some trials included an instruction to forget some of the items. Howard and Goldin (1979) showed kindergarten children (mean age, 5.8 years) a female doll, named “Amy,” who (they explained) had to wear special items of clothing to signal that she was a secret agent. The child’s task was to help Amy remember which items were special on any one day (i.e., experimental trial). This task was challenging because the items were always drawn from a set of 16 items, including 1 of 4 different hats (e.g., the hat could be a pillbox, beret, ski cap, or sailor hat), 1 of 4 different belts, 4 colors of flowers, and 4 types of neckpieces. Both the number of items that were said to be part of the “special signal” and the number of items that were presented but were not (for that trial) part of the special signal were varied across trials.

The investigators found that children could very efficiently selectively encode relevant information if they were told what types of items (e.g., hat and belt) were relevant before the doll was presented. In this case, children showed little interference from the presentation of other (but currently irrelevant) items. However, if children were told what types of items were relevant only after encoding, then they showed interference from the irrelevant items that were also presented.

Using a design in which children were repeatedly presented with one or two sets of pictures, but were sometimes told to forget one of the sets, Bray et al. (1983) also found that the youngest children (age 7 years) had no enhancement in the ability to remember the to-be-remembered items because the other items were cued as to-be-forgotten. For these children, performance was the same as if the child had been presented with both sets of items and was asked to remember both sets. However, 9-year-old children showed some ability to benefit from the forget cue, yet not as much as 11-year-olds, who showed complete elimination of the interference from the forget-cued items. (The latter result was also obtained with 11-year-olds in a subsequent study by Bray et al. 1985 and is also found with adults.)

More recently, the block-cuing directed forgetting procedure typically used with adults has also been studied in children. Harnishfeger and Pope (1996, Experiment 1) presented children (first-, third-, and fifth-graders) with a list of 20 unrelated words, with directions to repeat each word out loud as it occurred and to try to remember it. The children were interrupted after the first 10 words and were told either that the words presented up to that point had been “for practice” and so should be forgotten or that they should continue to remember the words while the next half of the list was presented. On a subsequent free-recall test, the fifth-graders (mean age, 11.5 years) showed consistent and significant directed forgetting, third-graders (mean age, 9.5 years) showed directed forgetting on one measure but not another (forgetting in a within-subjects comparison but not in a between-subjects comparison), and first-graders (mean age, 7.2 years) showed no directed forgetting. An essentially similar pattern was obtained in a replication study (Harnishfeger and Pope 1996, Experiment 2) that included an additional manipulation check to ensure that the children understood the directions given to them at the midpoint of the study list.

What do these findings imply about the ability of children to selectively encode—or remember—information in situations outside the laboratory, particularly situations involving abuse? Any form of direct extrapolation of these findings to such situations is clearly impossible. Nonetheless, they suggest that although even relatively young children may have the capacity to channel their efforts at remembering—provided that they know, at the outset, what it is that they are to remember—younger children may be less able to selectively forget information that they have already encoded and processed. By early adolescence, however, children may also be able to selectively forget stimuli or events even after that information has been encoded, effectively exercising control over information already present in memory rather than only precluding entry of information into memory in the first place.

**What Processes Underlie Successful Intentional Forgetting?**

Three processes have been postulated to underlie the successful forgetting of to-be-forgotten information that has been observed in the laboratory:

1. **Selective search of the to-be-remembered items**, according to which individuals are thought to initially code or “tag” to-be-remembered stimuli differently from to-be-forgotten stimuli and, then, during attempted retrieval, to somehow limit their search for a given item only to the to-be-remembered items.

2. **Preferential encoding and rehearsal of the to-be-remembered stimuli**, according to which individuals more extensively process the to-be-remembered items than the to-be-forgotten items.

3. **Retrieval inhibition**, according to which the intention to forget initiates a form of suppression such that the to-be-forgotten items are rendered less accessible during retrieval than the to-be-remembered items (Other processes that might render retrieval more dif-
ficult but that do not necessarily involve "inhibition" in a strict
sense are also possible.)

Evidence supportive of a possible role for each of these processes has
been found.

The strongest evidence for a contribution of selective search to suc-
cessful forgetting has been obtained using a multitrial short-term mem-
ory procedure (e.g., Epstein and Wilder 1972; Homa and Spieler 1974;
Howard 1976) that differs in several ways from the item-cuing and
block-cuing directed forgetting procedures described earlier in this
chapter. Although selective search may also contribute to enhanced
memory for the to-be-remembered items under the block-cuing pro-
cedure (particularly when only the to-be-remembered items are
tested), it does not seem sufficient to account for the full pattern of
results under either that procedure or the item-cuing procedure. For
example, it is not clear why—provided that individuals know that
the to-be-forgotten items are being probed—memory for the to-be-forgot-
ten items should be impaired. Why can individuals not just broaden
their memory search to include both the to-be-remembered and the
to-be-forgotten items?

Recent work has thus focused on evaluating the likely contribution
of the second and third processes: preferential encoding of the to-be-
remembered items on the one hand and disrupted access to the forget-
cued items during retrieval on the other. The preponderance of the
evidence suggests that intentional forgetting under the item-cuing
method derives from more elaborate and extensive encoding of the
remember-cued items. In contrast, several sources of evidence suggest
that a form of inhibition or disruption of retrieval access is most likely
involved in the block-cuing procedure.

The differential pattern of forgetting on recall versus recognition
testing is perhaps one of the more important sources of data supporting
this distinction. A pattern of impaired access to information during re-
call testing combined with intact performance during recognition test-
ning has long been thought to indicate that the information must have
been available in memory (or how could it have been recognized?) but
for some reason was inaccessible during attempted recall (Tulving and
Pearlstone 1966). Conversely, impaired performance despite the pres-
ence of strong and specific retrieval cues, such as those provided by a
recognition test, has been thought to point to the possibility that the
nonrecognized items were not stored in the first place (i.e., were not
only inaccessible but also unavailable) (e.g., Roediger and Crowder
1972). Important caveats apply to this general rule (e.g., under certain
conditions, the content or structure of the recognition test itself may
make it more difficult to access information that is available in memory);
nonetheless, impaired memory for the to-be-forgotten items during
recognition testing under the item-cuing method—but not under the
block-cuing method—is highly consistent with the notion that the to-
be-forgotten items may have an encoding disadvantage with the for-
mer but not the latter method.

A comparison of the task demands under the two methods also sup-
ports the plausibility of this interpretation. On the one hand, the close
proximity of the instruction cues to the initial presentation of the stimu-
lus items under the item-cuing procedure leaves ample room for sub-
jects to adopt a "wait-and-see" approach in their efforts to comply with
the task. That is, before making a full-scale effort to remember a given
item, subjects involved in the item-cuing procedure might "wait and
see" if the instruction cue indicates that the item is, indeed, supposed
to be remembered, fully elaborating on and actively rehearsing only
those items that are subsequently cued as to-be-remembered and mini-

mally processing the forget-cued items. On the other hand, the post-
ponement of the forget instruction under the block-cuing procedure
until many items have been processed and subjects' initial unawareness
that a forget instruction will be given at all both suggest that these items
were initially adequately encoded and processed but subsequently ren-
dered less accessible.

Two further findings are consistent with the interpretation that the
forget-cued items are less extensively elaborated on under item cuing
but not under block cuing: 1) subjects' recollection for the forget-cued
items is strongly impaired in item cuing but either not impaired or only
minimally impaired in block cuing, and 2) conceptual priming for the
forget-cued items may be reduced in item cuing but not block cuing.
Subjects' memory for the to-be-forgotten items when they are in-
structed to remember or to forget on an item-by-item basis is much less
often accompanied by additional information about the internal or ex-
ternal circumstances under which they first encountered the items than
is true for the to-be-remembered items. Asked to indicate not only
whether they recognize previously presented stimuli but also whether
they can recollect any specific episodic details about their earlier en-
counter with the stimulus (e.g., what the item led them to think about),
subjects involved in the item-cuing procedure had a very poor recol-
lection of the items they were instructed to forget (Basden et al. 1993b;
Gardiner et al. 1994; Koustaal 1996; for a general review and descrip-
tion of this remember/know procedure, see Gardiner and Java 1993). In
contrast, when subjects were instructed to forget using the block-cuing
procedure, recollection of the circumstances surrounding the forget-
cued items either was not impaired (Basden et al. 1993b) or was only
slightly diminished, with a significant effect apparent only in a meta-
analysis combining results across experiments (Koustaal 1996). Like-
wise, recent reports suggesting diminished performance for forget-cued
compared with remember-cued items on conceptual implicit tests, in-
cluding word association (Basden et al. 1993b) and general knowledge questions (Basden and Basden, in press), with the item-cuing procedure but not the block-cuing procedure suggest that in item cuing but not block cuing, the to-be-forgotten stimuli are less elaboratively encoded and processed than the to-be-remembered stimuli. (For discussion of the distinction between perceptual and conceptual implicit tests, see, for example, Roediger et al. 1989; Schacter 1994.) Nonetheless, it is possible that not all of the effects observed with the item-cuing procedure arise from enhanced encoding of the remember-cued items. For example, evidence also indicates that instructing subjects to use a more active form of forgetting—by mentally repeating “STOP” whenever a forget-cued item is presented—enhances the degree of forgetting observed compared with that observed for other strategies, including trying to think of nothing (i.e., trying to make one’s mind “go blank”) or deliberately rehearsing the to-be-remembered items (Geiselman et al. 1985, Experiment 2). Intriguingly, this enhancement of forgetting as a result of the use of the more active forgetting strategy was apparent only during free-recall testing. Although, overall, both recall and recognition of the to-be-remembered items were greater than that for the to-be-forgotten items, the more pronounced directed forgetting effect due to the use of the “STOP” procedure was apparent only on the recall test. A further experiment indicated that mentally repeating a nonsense word (“DAX”) whenever a to-be-forgotten item was presented was less effective in reducing recall than was repetition of the conceptually more meaningful word “STOP” (Geiselman et al. 1985, Experiment 3). These findings suggest that under some conditions, the directed forgetting effect observed with the item-cuing method may also derive, in part, from depressed availability of the forget-cued items (as well as, or in addition to, enhanced memory for the remember-cued items) and that more specific and focused voluntary efforts at suppressing the to-be-forgotten material may more strongly impair memory.

If the intentional forgetting observed under the block-cuing procedure primarily involves a form of suppression or disruption in retrieval access to the to-be-forgotten items, rather than poorer initial storage or encoding, how—more specifically—might such disruption or inhibition “work”? For example, can any other indications of disrupted access be obtained, apart from the diminished ability to recall the items themselves? Although the precise nature of the processes involved is unclear, several findings suggest that the inhibitory or disruptive effects may be somewhat diffuse, encompassing not only the information that was specifically subjected to an intention to forget but also other stimuli or attributes that were associated with the to-be-forgotten information.

Initial evidence suggesting that the instruction to forget might result in diminished access to the entire episode to which the forget instruction was applied was reported by Geiselman et al. (1983). In a series of experiments, they found that subjects who were instructed to forget the first of two blocks of items not only were less likely to recall the items that were designated as to-be-forgotten but also were less likely to recall other incidentally learned items that had been interspersed among the to-be-forgotten items but were never specifically mentioned as a target for forgetting. This diffuse form of forgetting was also observed, at least under some conditions, by Barnhardt (1993) after controlling for a potential artifact in the Geiselman et al. (1983) study and may be similar to a diffuse form of forgetting recently reported by Allen et al. (1995) with hypnotic virtuosos. Allen et al. found that hypnotic virtuosos had posthypnotic recognition amnesia not only for a studied word list for which amnesia was explicitly suggested but also for a word list that was learned during the same hypnotic session but was not covered by any amnesia suggestion—again suggesting that intentional forgetting may assume a more general or broadly encompassing form than is strictly required by the instruction.

Geiselman et al. (1983) noted that subjects who were instructed to forget the first block of items were especially inaccurate at determining when those items had occurred. The order in which subjects recalled the forget-cued items (as well as the incidentally learned items that had been interspersed with those items) also tended to be only weakly correlated with the order in which the items had originally been presented. This was not true for the remember-cued items or for the first block of items in a control group asked to remember the first block. These findings of both relatively poor source memory for the forget-cued items (indicated by difficulties in determining when they had occurred) and impaired retrieval organization for those items (indicated by the tendency to recall the to-be-forgotten items in an order that had little relation to the order in which they had originally been encountered) suggested that access to the forget-cued items might be impeded because of a disruption in the association between the items and representations of the context in which they had been learned.

A recent experiment conducted in our laboratory (Koutstaal 1996) also found evidence of disrupted access to a form of contextual information concerning the forget-cued items. This experiment involved a manipulation that heightened the distinctiveness of the to-be-forgotten versus the to-be-remembered items by associating all of the forget-cued items with one contextual factor (a group of people read all of these items) and all of the remember-cued items with another contextual factor (a different group of people read all of these items). Subjects were significantly less accurate at identifying the group of people who had been associated with the forget-
Voluntary Thought Suppression

The question of whether individuals can intentionally forget information about stimuli or events that they have already encountered and processed is closely linked with another question: To what extent can individuals successfully avoid or suppress conscious thoughts about an unwanted topic (independently of the effects this may have on memory)? Although some investigators have noted the connections between directed forgetting and thought suppression (e.g., Barnhardt 1993; H. M. Johnson 1994; Wegner et al. 1987), several differences in the experimental procedures used to study intentional forgetting and thought suppression have also been identified. Perhaps most important, investigations of voluntary thought suppression have typically involved instructions to suppress thoughts about a single topic or episode, whereas investigations of directed forgetting have most often involved instructions to forget many items of information that are usually entirely unrelated to one another or that are derived from several different semantic categories. (Note that for the block-cuing directed forgetting method, even though an entire set of previously encountered items is designated as to-be-forgotten—and so in one sense a single temporal episode is targeted for forgetting—many different and usually semantically unrelated items are in the block. This differs from having only a single topic or theme to be suppressed.)

Several experiments have investigated the degree to which individuals could successfully suppress thoughts about essentially neutral or innocuous topics. Specifically introduced by the experimenter as a target for attempted thought suppression, these topics have included both relatively whimsical and novel subjects (e.g., thoughts about a white bear or a story about a green rabbit) and more familiar and mundane matters (e.g., thoughts about vehicles or the Statue of Liberty). Can individuals successfully suppress such thoughts? What might experimental investigations of the suppression of such thoughts reveal about the suppression of more emotionally significant and personally relevant topics?

On the one hand, the processes involved in the suppression of thoughts that have considerable emotional and personal significance may well differ in important ways from the processes that allow the eradication or reduced frequency of more neutral thoughts. Emotionally neutral and experimenter-provided thoughts may differ from personally relevant thoughts in how familiar, how complex, and how easily imagined they are and in how much experience individuals have in attempting to control them (Kelly and Kahn 1994). Also, as Salkovskis and Campbell (1994) observed, the emotional effects of the intrusive thoughts may modify the ways in which such thoughts are processed (emotion may affect the nature of the thought itself), and the individ-
ual's cognitive appraisal of the meaning and implications of the thoughts may affect the intensity or nature of the motivation to suppress (i.e., thoughts about the thought may influence further affect and motivation about the thought).

On the other hand, exploration of the relative success with which individuals can suppress emotionally neutral or experimentally suggested thoughts allows greater experimental control than is otherwise possible. Such exploration may permit the isolation and identification of factors that may also moderate the suppression of personally relevant thoughts but that—given the idiosyncratic and often complex set of conditions involved in their formation and maintenance—may be very difficult to disentangle. Confining experimental examination of thought suppression to only those thoughts that individuals find intrusive and personally distressing in their lives clearly has its own hazards, not the least of which is sampling bias. When only thoughts that have been identified as intrusive and as recurrent sources of distress are used as objects of experimental investigation, whether (or how often) other thoughts have been successfully suppressed and what conditions allowed such suppression cannot be determined. Ascertain how, when, and to what extent individuals are able to suppress comparatively unfamiliar and externally introduced thoughts may provide a “window” on the very early processes that are involved in suppression, allowing determination of the conditions that may lead either to a future and chronic course of unsuccessful suppression or to successful suppression.

Fortunately, investigators do not need to choose between these two alternatives, and several recent experiments have been reported using targets for suppression that have greater emotional and personal significance to the individuals. We next review some of the central findings from these investigations, beginning with emotionally neutral materials.

Can Adults Voluntarily Suppress Emotionally Neutral Thoughts?

Most of the evidence from studies using emotionally neutral materials indicates at least some degree of initial success in suppressing a target thought—when success is measured on the order of several minutes. For example, in one of the earliest studies of thought suppression, Wegner et al. (1987, Experiment 1) compared two groups of subjects. Both groups of subjects first participated in a 5-minute practice session with a stream-of-consciousness technique in which they were asked to verbalize continually what they were presently thinking without attempting to explain or justify their thoughts. Then, one group of subjects—the initial suppression condition—was instructed to continue to verbalize their thoughts in the same manner as before with one impor-

\[\text{intentional forgetting} \quad \text{thought suppression}\]
asked to suppress a neutral thought often show a "rebound" in the frequency with which the target thoughts occur, such that during a subsequent postsuppression period, they more often think of the thought than if they had not been asked to suppress. Individuals who earlier tried to suppress a neutral thought and were later either asked to express the thought (e.g., Kelly and Kahn 1994; Wegner et al. 1987, 1991) or were encouraged to think about anything they liked (Clark et al. 1991, 1993) showed significantly more frequent occurrences of the thought than did persons who were never asked to suppress the thought (but were first asked either to express the thought or to think about anything).

Why does this rebound effect occur? Is a resurgence of the frequency of the "unwanted" thought inevitable, or might rebound somehow be prevented, so that voluntary thought suppression would prove to be a more enduring remedy for unwanted thoughts? Most important, does a similar effect occur with emotionally and personally significant materials?

Two primary accounts of the rebound effect have been proposed, each of which has received some support. However, we discuss these accounts—and what the evidence concerning them tells us about the conditions under which successful thought suppression may occur—after a review of studies involving the suppression of emotional materials. Surprisingly, the evidence for rebound effects with emotional materials is considerably less strong than for neutral materials.

Can Adults Voluntarily Suppress Emotionally Significant and Personally Relevant Thoughts?

The findings as to whether adults can voluntarily suppress thoughts that are more intimately associated with their emotional, motivational, and personal lives are decidedly mixed and complex. Both the somewhat equivocal nature of the findings and the complexity arise from three factors: 1) variability in how particular thoughts were selected as targets for suppression, 2) differences in how long (and in what contexts) suppression instructions were maintained, and 3) differences in the characteristics of the individuals chosen for inclusion in the studies.

Unsuccessful suppression, involving a failure to suppress negative or aversive materials, has been reported by several investigators. Two such reports involved instructions to suppress a target thought over a period of several days—including contexts outside the laboratory setting. Muris and Merckelbach (1991, cited in Muris et al. 1992) first read subjects a transcription of Freud's Ratman obsession and then instructed one-half of the subjects to suppress all thoughts of the transcription; the remaining subjects were given no instructions about suppression. One week later, subjects were interviewed as to the frequency with which they had thought of the transcription over the past week. Subjects who had been given suppression instructions reported more intrusions of the thought than did subjects who had not been encouraged to suppress.

Although suggestive, the reliance on individuals' subjective and retrospective reports to determine thought occurrences in this study is clearly highly problematic. A more convincing indication that individuals' longer-term efforts at deliberately suppressing negative thoughts may prove unsuccessful has recently been reported by Trinder and Salkovskis (1994). Subjects in this study (undergraduates) were preselected from a larger population on the basis of a questionnaire describing and assessing negative intrusive thoughts; to be selected into the study, subjects had to report having experienced such thoughts during the preceding month. Individuals who met this criterion were then interviewed on two occasions, separated by 4 days. During the first session, subjects were asked to identify, and then evaluate, a specific negative intrusive thought on various dimensions (e.g., amount of discomfort experienced during the thought). They were also given a habituation sequence for the thought, in which they were repeatedly asked to imagine the thought as clearly as possible and then (again) to evaluate various aspects of the thought. Thereafter, they were assigned to one of three groups: 1) a suppression group, instructed to try to suppress the thought as quickly as possible whenever it came to mind; 2) a control group, instructed simply to record any occurrences of the target thought ("record only" group); or 3) a third group, instructed to think about the target thought as much as possible whenever it occurred without modifying the thought ("think through" group). Subjects were also given postcards on which to write any occurrences of the thought, with separate sections for each of the 4 days, and were given a distinctive reminder cue to wear on their watches to help them remember to record any target thoughts.

Subjects who were asked to suppress experienced more of the target thoughts than did subjects in either the record only group or the think through group, which did not differ from each other. Nonetheless, subjects' self-ratings of the degree to which they had attempted to suppress thoughts were higher for the suppression group than for the other groups, suggesting that greater frequency of the target thought occurred despite greater efforts at suppression.

Do these findings indicate that emotional materials cannot be suppressed and that suppression may even lead to precisely the opposite effect—increased rather than decreased cognitive and emotional involvement with the unwanted thought? In answering this question with regard to this study and other studies that have explored thought suppression of emotional materials, it is critical to keep in mind a point raised earlier in this chapter: When only thoughts that have been iden-
tified as intrusive and as recurrent sources of distress are used as objects of experimental investigation, whether (or how often) other thoughts have been successfully suppressed and what conditions allowed such suppression cannot be determined. Two forms of “selection bias” may operate in such cases: bias in the thoughts within individuals that are selected for examination and bias in the particular persons who are selected for the study. For example, in the Trinder and Salkovskis (1994) study, only slightly more than one-half (56%) of the larger population of students that was originally sampled reported having negative intrusive thoughts during the preceding month, and all of the subjects included in the study were selected from this subset of students. What about the other 44% of the sample? Why had they not experienced (or at least not reported having experienced) such thoughts? How might these individuals respond differently to negative or aversive thoughts than the 56% included in the study?

The experimental evidence on thought suppression may be examined with different questions in mind. To investigate whether thought suppression provides a viable model for the occurrence of rumination or obsessive thinking, selection on the basis of the presence of intrusive and recurrent negative thoughts may well increase ecological validity. But to examine whether individuals, in general, can voluntarily suppress negative or aversive thoughts, preselection of subjects may prove misleading.

It is important that several additional studies that have reported unsuccessful attempts at thought suppression also preselected subjects (e.g., Mathews and Milroy 1994; Salkovskis and Campbell 1994). In contrast, five studies that either reported successful initial suppression of emotionally significant or negative thoughts (Kelly and Kahn 1994; Roemer and Borkovec 1994; Wegner and Gold 1995; Wegner et al. 1990) or were ambiguous (Muir et al. 1992), none preselected subjects specifically on the basis of intrusiveness or nonintrusiveness of thoughts. Although in two cases, subjects were selected or assigned to particular experimental groups on the basis of the nature and intensity of emotional responses they had to particular situations or persons (Roemer and Borkovec 1994; Wegner and Gold 1995), subjects were not included precisely on the basis of the intrusiveness of particular target thoughts in any of these studies.

Muir et al. (1992) asked subjects (undergraduates) to read a story that involved a highly negative event (subjects were asked to imagine themselves being late for an appointment, speeding through a yellow traffic light, and causing an accident in which a child is killed) or a very similar story in which the emotional words and phrases were replaced by neutral elements. Thereafter, subjects in the emotional and neutral story conditions were assigned either to a suppression condition or to a “think of anything” condition, in which they were free to think or not to think about the story they had read. This first phase, which lasted for 5 minutes, was followed by two 5-minute “think of anything” phases, with the first free expression phase occurring immediately after the initial suppression or expression phase and the second occurring after a 20-minute unrelated task. (Thus, for both the emotional story and the neutral story, one group of subjects received a suppression phase immediately followed by a think of anything phase, followed 20 minutes later by an additional think of anything phase; another group of subjects received a think of anything phase on all three occasions.) During each of the three critical phases, subjects were told to press the button of a hand-held event marker each time they happened to think of the story.

There was no indication that subjects given the suppression instructions—for either the emotional or the neutral story—were successful in less often thinking about the story. Both of these groups tended to think about the story as often as subjects in the emotional think of anything condition, and all of these groups thought of the story more often than subjects in the neutral think of anything condition. In the former three groups (suppress—neutral, suppress—emotional, think of anything—emotional), there was a slight trend for fewer thoughts to occur during the second (think of anything) phase than during the initial phase, and thoughts of the story had clearly decreased by the third (think of anything) phase. On the one hand, the equivalence of the two suppression groups to the think of anything—emotional group during the initial phase does point to a failure of initial suppression. On the other hand, the largely parallel decrease in thoughts of the story in all three groups across the later two periods appears to indicate a form of habituation to thoughts of the story over time. Such habituation is clearly inconsistent with the notion that rebound would occur after attempted suppression.

Four studies, using quite different emotional topics as targets for suppression, have provided evidence for successful initial suppression of emotional thoughts. Wegner et al. (1990) examined mentions of target thoughts under suppression compared with expression instructions for an exciting topic (e.g., thoughts about sex) and a relatively less exciting topic (e.g., thoughts about dancing). Although suppression did not entirely eliminate the target thought, mentions were clearly less frequent during suppression than during expression instructions. Evidence also indicated that the frequency of the target thoughts decreased with both suppression and expression instructions for shorter (4-minute) and longer-term (30-minute) periods, suggesting that thoughts about exciting topics were not especially susceptible to rebound.

Initially successful suppression has also been reported for thoughts about an "old flame" (i.e., a "significant past romantic relationship") (Wegner and Gold 1995), individuals' own intrusive thoughts (Kelly
and Kahn 1994), and personal situations specifically associated with depression or anxiety (Roemer and Borkovec 1994). For example, Roemer and Borkovec (1994) found that the proportion of direct statements related to a to-be-suppressed topic situation under initial suppression instructions was 19% for a depressing situation, 26% for an anxious situation, and 17% for a neutral situation; under initial expression instructions, the corresponding proportions were 89%, 67%, and 45%. Suppression was also successful when negative affect statements were the dependent measure, such that under expression conditions, depressed and anxious groups expressed more negative affect than the neutral group, and under suppression instructions, negative affect for the depressed and anxious groups did not differ from that for the neutral group. However, suppression was not observed for indirect statements about the situation (e.g., if the subject's depression involved the loss of a friend, but the subject referred to some other loss); such indirect thoughts were not affected by the suppression instruction.

Little evidence of a rebound effect was found in the study by Kelly and Kahn (1994) involving subjects' own intrusive thoughts. In the study by Wegner and Gold (1995), a rebound effect was observed only for participants who suppressed thoughts about an individual they no longer desired or often thought about (a "cold flame"). Whereas cold flame participants reported more thoughts about the past romantic relationship if they had just suppressed thoughts of that relationship than if they had just suppressed thoughts about a neutral topic (e.g., thoughts about the Statue of Liberty), "hot flame" participants, when invited to talk about their past romantic relationship, often spoke about their old flame regardless of whether they had just suppressed thoughts of the flame or had just suppressed thoughts about a neutral topic. Thus, although both hot and cold flame participants were able to initially suppress thoughts about their past romantic relationships, this suppression bore no special costs of increased thinking about the relationship for the hot flame participants, but it did for cold flame participants. (A possible account of this result is provided in the final section.)

In summary, most studies with neutral stimuli indicate some degree of success in initially suppressing the target thought. Similar results have been obtained in most studies with more emotionally significant materials—provided that subjects were not preselected on the basis of their inability to suppress particular thoughts. However, especially in the case of neutral thoughts, but less so for emotionally significant thoughts, initial suppression is often followed by a rebound. When later given the opportunity either to specifically express the target thought or to think of anything at all, individuals who had earlier suppressed a neutral thought are especially likely to think of that very thought. What might account for this effect, and, equally important, why might it less frequently occur with emotionally significant materials?

**What Processes Underlie Successful—and Unsuccessful—Voluntary Thought Suppression?**

Analysis of subjects' reported thoughts during their attempts to suppress an unwanted thought revealed that many individuals were using an unfocused form of self-distracting. In their effort not to think about the "forbidden" thought, subjects often focused their attention on various apparently harmless aspects of their immediate surroundings (e.g., the wall, the light switch, their shoes). However, because subjects often focused on these environmental details immediately after they had failed to suppress the unwanted thought, these "would-be-distractors" may have become associatively linked with the to-be-suppressed thought—and so may later act as reminders of the to-be-avoided topic.

Indirect support for this "association" hypothesis (Wegner and Gold 1995; Wegner et al. 1987) has been obtained from two sources. First, individuals have been shown to show more resistance to a rebound of the unwanted thought if they are instructed to use a specific distractor thought. Rather than engaging in an unfocused and haphazard search for satisfactory alternative thoughts in which sundry things may—in unwittingly—become cues to the thought, individuals may be encouraged to consistently replace unwanted thoughts with another specific thought. Rebound has been reduced in the presence of focused distraction both with a neutral target (e.g., thoughts of a white bear) as the to-be-suppressed item (Wegner et al. 1987) and with naturally occurring intrusive thoughts. Providing subjects with a specific distractor task to perform during their attempts to suppress a naturally occurring intrusive thought (Salkovskis and Campbell 1994) diminished the frequency with which intrusions occurred, both compared with a condition in which only general (unfocused) distraction instructions were given and compared with the usual suppression instructions (in which no distraction strategies are specifically mentioned). (Interestingly, the clinical use of thought suppression may involve both thought-stopping and instruction in the use of a pleasant distractor thought. See, for example, Kumar and Wilkinson 1971; Turner et al. 1983.)

Although consistent with the association hypothesis, these findings have alternative interpretations. For example, to the extent that reliance on a specific distractor thought results in fewer occurrences of the unwanted thought, then the unwanted thought is itself less elaborated and firmly encoded. Less elaborated and firmly encoded thoughts may themselves be less readily recalled independent of whether particular cues were associated with the thoughts to prompt their return.

Possibly stronger support for the association hypothesis derives from comparisons of the degree to which individuals are successful in maintaining thought suppression when they are either in an environment that closely matches that in which they initially tried to suppress an
unwanted thought or in a situation that differs in important ways. Several studies have found that intrusions of an unwanted thought are less common after the individual’s environment is altered, both when external features of the environment are changed and when the individual’s mood or “mental context” (Lockhart 1988; Smith 1995) is changed. For example, Wegner et al. (1991) manipulated the external context that was present during thought suppression by showing color slides drawn from different themes (e.g., landscapes or household appliances) during subjects’ efforts to suppress thoughts about a white bear and then by showing slides from the same theme or a different theme during a subsequent expression period. The rebound effect was considerably stronger if the slides during initial suppression and later expression were the same than if they were different. There was also evidence that the slides themselves were mentioned more frequently during initial suppression than initial expression instructions (i.e., at the point at which distraction was first occurring), and, during subsequent expression, references to the slides were more often directly followed by references to the white bear for initial suppression than for initial expression subjects.

During unfocused attempts at distraction, individuals may turn their attention not only to various aspects of the external environment but also to their current concerns, intentions, memories, and so forth. To the extent that these internal sources of distraction are filtered by the individual’s present mood (e.g., such that depressed people tend to choose negative thoughts as distractors more than do nondepressed people), then altering an individual’s mood might act in a manner similar to altering the external environment. By reducing the likelihood that previous distractor thoughts return to mind, alterations in an individual’s mood should also reduce the likelihood that the associations between these earlier thoughts and the unwanted thought will prompt return of the unwanted thought. Alterations in mood have, indeed, been found to act in this way. For example, Wenzlaff et al. (1991) used a mood induction procedure to encourage (“induce”) subjects to feel either relatively more or less positive during an initial suppression period and either more or less positive during a later expression period. Although initial suppression subjects showed a rebound effect regardless of whether their mood was the same or different between the earlier and later periods, the rebound effect was stronger if the subjects’ mood was congruent in both phases (negative-negative, positive-positive) than if it was incongruent (negative-positive, positive-negative).

This effect was found for suppression of a neutral thought (i.e., thoughts of a white bear). Heightened rebound effects under mood-congruent conditions have also been established with positive and negative autobiographical events, both when mood was experimentally manipulated via a mood induction procedure (Howell and Con-
the thought will recur—even with very little prompting or cuing.

If both a controlled process of suppression and an automatic process of detecting stimuli associated with the unwanted thought are occurring, then a manipulation that interferes with the ability to consciously suppress should "uncover" the automatic process. More specifically, if the intention to suppress engenders an automatic process of hypervigilance for items associated with the unwanted thought, then—provided one can effectively circumvent or undermine conscious efforts at suppression through distraction—it might be possible to observe hyperaccessibility of the to-be-suppressed thought. Individuals instructed to suppress a target thought might show that thought (and possibly thoughts associated with it) to be even more accessible to them than to individuals who are deliberately attempting to concentrate on that same thought (concentration presumably requiring vigilance but not necessarily hypervigilance).

Consistent with this expectation, Wegner and Erber (1992) found that subjects who were attempting to suppress a particular neutral target thought (e.g., house or mountain) when placed under high "cognitive load" showed hyperaccessibility of the thought. Asked to very rapidly produce associations to various words, subjects who were attempting to suppress a given target word were more likely to give that word as an association than were subjects who were trying to concentrate on the word. Asked to perform the same task but without any particular time pressure, the reverse occurred: subjects concentrating on the topic more often provided it as a response than did subjects suppressing the topic. Additional evidence supportive of altered accessibility of the target thought has also been reported with a modified version of the Stroop task (Wegner and Erber 1992, Experiment 2; see Lavy and van den Hout 1994).

Taken together, all of these findings suggest that both associative cuing and alterations in the accessibility of the target thought may influence the likelihood of successful suppression. As suggested by Macrae et al. (1994), the accessibility hypothesis possibly can be extended or modified to include associative cuing factors. To the extent that features of one's internal or external context become associated with the to-be-suppressed target thought, then the target may receive additional activation when the context is maintained or reinstated. A modified account such as this might also more readily accommodate the findings that reinstatement effects (e.g., Davies and Thomson 1988) and reduced proactive and retroactive interference due to altered contexts (e.g., Kanak and Stevens 1992) may be observed in other paradigms even when no particular conscious or deliberate attention has been directed toward aspects of the environment. We next discuss the possible relevance of these findings and previously reviewed findings on directed forgetting in regard to traumatic situations.

Integration and Relation to Abuse Literature

Our comments in this section focus on three factors: 1) the importance of external and internal context as a moderating factor in both intentional forgetting and thought suppression, 2) the interconnectedness of intentional forgetting and thought suppression with other factors (including other forms of coping) that may affect memory, and 3) future directions and questions.

The Importance of External and Internal Context

The critical role of the amount of retrieval support offered by the environment during attempts to probe memory has long been recognized (e.g., McGeoch 1932; Tulving 1983). However, a review of findings on both intentional forgetting and voluntary thought suppression suggests that retrieval cues may assume a more than usually potent role in prompting the return of to-be-forgotten or to-be-suppressed thoughts. Encountering all (Basden et al. 1993a, 1994; Geiselman et al. 1983; Koutstaal 1996) or even only a few (Bjork and Bjork 1991; Goernert and Larson 1994) of the to-be-forgotten items following an attempt to forget an entire set or block of items may largely eliminate the mnemonic disadvantage for the forget-cued items that would otherwise have been observed. Such "release from retrieval inhibition" (Basden et al. 1993a; Bjork 1989) on reexposure to the to-be-forgotten stimuli is similar to the effect produced by encountering aspects of the environment that were present during earlier attempts at thought suppression. Rebound of thoughts is especially strong in external and internal conditions that closely parallel those prevailing during initial attempts at suppression.

These findings suggest that retrieval cues may also be especially important in prompting the reemergence of thoughts or memories of traumatic incidents when people attempt to suppress or forget those incidents. Many investigators have specifically pointed to the role of retrieval cues in prompting recall of previously forgotten or suppressed incidents of abuse (e.g., Feldman-Summers and Pope 1994) or have reported individual cases consistent with such a view (McNally et al., unpublished data, February 1996; Schoeler 1994; see also Christensen et al. 1981; McGee 1984). For example, some anonymous women who were self-reported survivors of father-daughter incest that had occurred an average of 20 years earlier still reported recurrent, intrusive, and disruptive memories, and most respondents reported that memories, thoughts, and images of the experience were likely to be triggered by salient cues in their everyday interactions (Silver et al. 1983).

As the time from an original episode of abuse increases, an individual's external context is likely to have changed, thus increasing the like-
lihood of successful forgetting. Individuals may also deliberately alter their living or work circumstances to facilitate forgetting. Interviews of adults who had been raped 4–6 years earlier (Burgess and Holmstrom 1979) revealed several strategies that the victims used to cope with the rape. In addition to thought suppression, many individuals changed their residence or traveled. Some victims moved into a new apartment within the same neighborhood, others moved to a completely different neighborhood, and still others (often those with less financial independence) temporarily stayed with relatives or friends. Some of these individuals directly remarked on the positive aspects of moving. For example, one victim said, "I think it was easier for me because I went to another city and wasn't reminded of it. I didn't have to see it every day. I could forget it" (Burgess and Holmstrom 1979, p. 1280).

Nonetheless, complete avoidance of all reminders is unlikely to be successful, particularly when reminders may also include an individual's internal cognitions and feelings at the time of attempted suppression. Kuyken and Brewin (1994) found that women with a history of childhood sexual or physical abuse who were currently depressed reported both high levels of intrusive memories of the abuse and avoidance of those memories. This preliminary study did not permit the directionality of these effects to be determined (did intrusive memories lead to depression, or did depression encourage higher levels of intrusive memories?) nor did it include an assessment of the extent to which high intrusiveness and avoidance were especially true for memories of abuse as opposed to negative and stressful life events more generally. However, both the increased availability of negative thoughts and the decreased capacity for cognitive effort caused by depression could act to undermine attempts at suppression (see, for example, Conway et al. 1991; see also Freeston et al. 1995) by enhancing similarity to the original context in which suppression had occurred and by diminishing the ability to find or devise effective distractor thoughts.

The Interconnectedness of Intentional Forgetting and Thought Suppression With Other Factors That May Affect Memory

A self-initiated effort to avoid thoughts or memories of abuse may interact with and supplement factors in the environment that encourage thought suppression and forgetting. The press toward secrecy or discomfort experienced when discussing an incident may decrease the extent to which thoughts about the incident are elaborated and conceptualized (see Goodman et al. 1994; see also Fivush and Schwarzmueller 1995). Both self-initiated and externally encouraged efforts to suppress thoughts may either diminish or increase the formation of interassociations between thoughts about the abuse and other aspects of the individual's internal and external environment (e.g., Nelson 1993; Tessler and Nelson 1994). Although the latter possibility—that attempts at suppression will increase associative ties between the thought and the environment—is highlighted by the association hypothesis, the degree to which such interassociations are formed is also clearly moderated by the presence or absence of focused distractor techniques. For example, one account of the findings from Wegner and Gold (1995) that were discussed earlier in this chapter, in which only participants who had suppressed thoughts about a "cold flame" showed a rebound effect, focuses on the importance of environmental cuing together with distractors. Kelly and Kahn (1994) proposed that individuals thinking about a "cold flame" may not have been recently suppressing thoughts about him or her; so they were not prepared with salient or focused distractors. They may, therefore, have been more likely to use cues in the external laboratory environment to provide distraction, thereby also increasing the likelihood of later rebound due to environmental cuing.

Evidence indicates that individuals who have been abused may have fewer specific memories from childhood and may more often produce "overgeneral" autobiographical memories in response to word cues (see Kuyken and Brewin 1995; Parks and Balon 1995). These autobiographical memory deficits may partially result from diminished encoding or later elaboration and thinking of the times when abuse occurred (see J. M. G. Williams 1992). It is at least possible that poor memory for entire periods may reflect earlier efforts not to think of specific episodes by also not thinking of events, people, or places associated with abuse.

Likewise, cognitive changes due to development are not neatly separable from thought suppression or intentional forgetting. Although cognitive developmental changes may directly result in diminished memory caused by infantile or childhood amnesia (e.g., Howe et al. 1994; but cf. Nelson 1993), developmental factors may also affect the likelihood that intentional efforts at controlling memory will be undertaken and the probable success of such attempts. Discussing the interview responses of women with documented incidents of childhood abuse, L. M. Williams (1995) noted that some women reported that they did not immediately begin intentionally blocking out memories of the abuse but began doing so only some time later. On the one hand, as L. M. Williams (1995, p. 668) observed, this may be because developmental factors precluded the use of such strategies: "[D]eliberate forgetting may be available as a strategy only for the child who has attained more formal cognitive operations and has at least some limited verbal skills." On the other hand, as L. M. Williams also noted, because these reports were based on participants' subjective reports, documenting whether such delayed attempts at voluntary forgetting do, in fact, occur requires longitudinal research. More generally, the issue of the fre-
Frequency of delayed attempts to forget trauma is important, especially because such delays may be more likely to be accompanied by aid from the environment in the form of contextual change and thus are more likely to be successful.

Self-reports including phrases such as “I blocked it out” or “I didn’t think about it” do not convey how this occurs. Although, as observed at the outset, there is little reason to believe that there is a form of massive unconscious repression of traumatic incidents, the exact manner in which individuals use conscious efforts to not think about traumatic events is unclear. Does “blocking it out” involve a simple effort not to think about the event or the use of specific distractor thoughts? If so, how is distraction related to dissociation or to related factors such as imaginative involvement or absorption (e.g., Kihlstrom et al. 1994; Spiegel and Cardená 1991; Tellegen and Atkinson 1974; see also Trickett and Putnam 1993)? Evidence from both the directed forgetting and thought suppression literature clearly shows that the use of focused distractors results in a more effective limitation of memory and thoughts than does unfocused distraction. How, more precisely, did individuals such as those cited earlier from the L. M. Williams study “block out” memories or thoughts of the abuse?

Finally, there is also a complex interplay of denial or blocking of cognitive information and the repression of emotion (e.g., Davis 1990; Weinberger et al. 1979). What role might the denial of the emotional effect of traumatic or stressful events, the isolation of affect, or affective blunting play in thought suppression or intentional forgetting? For example, in a recent case reported by Mann and Delon (1995, p. 503), a woman who had been raped at age 14 by her sister’s fiancé confided that: “In previous years, memories of the rape had occasionally invaded her thoughts, but were infrequent and were associated with little affect.” To what extent did emotional numbing render recall less likely to begin with? And—even if memories did invade her thoughts—to what extent did the emotional numbing preclude or curtail any cognitive processing and elaboration of those memories, thereby also rendering future retrievals less likely? Although some evidence indicates that successful cognitive suppression may not necessarily be accompanied by successful emotional suppression (Wegner et al. 1990), it is also probable that cognitive suppression may sometimes “benefit” from emotional suppression (see, for example, Holtgraves and Hall 1995; Kuhl 1985; Tmorken and Davidson 1994).

Future Directions and Questions

Research on voluntary thought suppression has been limited in that it has primarily examined factors that influence the frequency of the to-be-suppressed target thought on a short-term basis and following a counterinstruction that explicitly encourages or implicitly permits the occurrence of the target thought. However, this research cannot inform us as to what would happen if individuals persisted unabated in a continued attempt to suppress the target thought. To be effective, perhaps suppression does not need to be absolutely or entirely successful directly from the beginning. Initial expression or thinking about an episode followed by thought suppression ultimately might be a more effective way to forget. Research exploring the consequences of a more sustained long-term effort to suppress, particularly after different degrees of initial elaboration and expression of the thought, is especially needed.

Likewise, as noted earlier in this chapter, further research on contextual factors in directed forgetting, particularly when larger episodes are involved (block cuing), is also needed. Research employing multidimensional and complex materials, especially emotionally significant materials, would be particularly valuable. In addition, it would be informative to begin to explore item cuing and block cuing within individuals rather than only across individuals. If the processes involved in the two procedures are, indeed, fundamentally different, are individuals especially adept at one form and not the other? Can individuals become more proficient at forgetting with appropriate instructions? The results of the study by Geiselman et al. (1985), discussed earlier, in which subjects who were instructed to use the mental “STOP” procedure rather than other less active and less focused strategies showed greater forgetting, suggest that more explicit strategy instructions may well enhance forgetting. However, comparable studies using the block-cuing procedure would also be informative. Also, many studies would benefit from a focus not only on the consequences of suppression or attempted forgetting on recall or recognition of the to-be-forbidden information but also on the degree to which memory for the target episodes corresponds to the earlier events—memory accuracy as well as accessibility (see Koriat and Goldsmith 1996). Explorations of the accessibility of contextual information under directed forgetting with the block-cuing procedure suggest that errors in monitoring the source of information (e.g., M. K. Johnson et al. 1993) might be especially pronounced for material that was earlier subjected to the intention to forget. What are the hazards for memory accuracy arising from attempts to consciously forget? Are the impairments in source memory documented thus far with the block-cuing method (Geiselman et al. 1983; Koutstaal 1996) due to the involvement of contextual representations in initiating forgetting in the first place? Or might more general decrements in accuracy be observed?

Horowitz (1986, cited in Greenberg 1995, p. 1283) has differentiated three types of adaptive control that a traumatized individual might exercise over intrusive cognitions: “(a) control over when, where, in
what manner, and for how long the trauma is contemplated; (b) control over the self-concepts and world views that guide the review; and (c) control over what information about the trauma is considered and what is disregarded.” Neither obsessive rumination nor complete failure to cognitively and emotionally work through trauma is likely to result in optimal adjustment. Nonetheless, a certain degree of intentional forgetting may in some—possibly many—cases ultimately prove to be a healthy response. An intrusive and too pervasive concern with abuse may undermine what one hopes to establish: present and future relationships that move beyond exploitation, toward increasing strength and autonomy. On the one hand, insufficient conscious awareness and emotional and conceptual understanding of the nature and ramifications of the abuse may leave individuals vulnerable to harmful consequences of abuse, including the possibility of repeated abuse. On the other hand, excessive intrusiveness of the abuse into consciousness and preoccupation with the abusive episodes also may leave individuals vulnerable and diminish functioning at all levels. Seeking greater understanding of when it is best to remember and when it is best to suppress or to forget is to some degree not only an open empirical question at the nomothetic level but also a deep empirical question—in the sense of rooted in experience—at the idiographic level. Nonetheless, experimental research can also provide guidance at this level and may ultimately provide understanding not only of the conditions that may allow survival but also of successful overcoming and healing.

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