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Publication Details

Basic and Applied Memory Research: Theory in Context

Repository Citation

Hertel, P. T. (1996). Practical aspects of emotion and memory. In D. Herrmann, C. McEvoy, C. Herzog, P. T. Hertel, & M. K. Johnson (Eds.), *Basic and applied memory research: Theory in context* (vol. 1, pp. 317-336). Lawrence Erlbaum.

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Practical Aspects of Emotion and Memory

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Can anyone doubt that the study of emotion and memory should have practical implications? Surely not those among us who have had emotional experiences and sometimes try to forget them, to remember them, or to remember other things while having them. Extreme examples include the witness to a robbery and the victim of abuse. Less dramatically but far more commonly, anxious or depressed people perform everyday acts that are memory dependent. Indeed, a practical or useful science of memory should have a great deal to say about how memory works under such emotional conditions.

Research on emotion and memory is also practical for the science at large, because it can extend the usefulness of a general theory. This practical aspect provides the glue for this review. Together with many other researchers in theoretical aspects of emotion and memory, I argue that the memorial correlates and consequences of emotion are best viewed as pertaining to the effects of emotion on the focus and control of attention. This is a fortunate vantage point for practitioners, who want to know what they can and cannot depend on and control when emotion is involved in memorial episodes. Thus, this chapter briefly and selectively describes some recent literature on emotion and memory from the theoretical perspective of attentional control and from the practical perspective of how the findings might be useful to people who have feelings.

The description is restricted to the domain of negative events and states. Elation, passion, other positive states, and the events that produce them also

deserve our attention but, apart from being difficult to capture or establish experimentally, they are unfortunately too transient in our culture to cry out for practical approaches. Further, although a wide variety of psychological phenomena, disorders, and practices are related to memory under negatively emotional circumstances, I describe only those that have received the most attention from cognitive psychologists: eyewitness, flashbulb, and possibly repressed memories, and the ubiquitous disorders of anxiety and depression. Even with these restrictions, the bodies of relevant research are still quite large; my description, therefore, often cites recently published reviews instead of the important empirical investigations. Finally, a portion of the literature on depression and memory is examined in greater detail for possible therapeutic applications.

THEORETICAL OVERVIEW

The construct *attention* is central to many theoretical accounts of emotion and memory phenomena. Essentially, these phenomena can be understood as a function of the focus of attention during an initial episode or when it might come to mind on later occasions. The accounts described in this chapter differ according to the phenomena they were designed to address. What they all have in common is reference to a continuum of automatic to controlled mental procedures, as elucidated by early attention theorists like Kahneman (1973), Posner and Snyder (1975), and Shiffrin and Schneider (1977). Briefly stated, automatic procedures are native to the organism or develop from practice. Although they sometimes can be intentionally initiated or interrupted, they do not require attention or intention for their performance. Controlled procedures, in contrast, are those that require attention or conscious focus. In spatial metaphors, controlled mental acts draw on limited attentional capacity. In this chapter, I argue that many accounts of emotion and memory emphasize the control of attention by emotional stimulation as a predictor of performance on memory tasks.

A convenient departure point is found in Bower's (1992) review of the role played by surprising events, both in engendering arousal and in focusing attention on critical aspects of the events. At the time of such focus, arousal activates the autonomic nervous system (ANS) and hormonal systems, which in turn directly affect storage activities in the brain (see Gold, 1992; LeDoux, 1992; McGaugh, 1992). Similarly, Mandler (1992) claimed that "a majority of occasions for visceral (sympathetic nervous system) arousal follows the occurrence of some perceptual or cognitive discrepancy, or the interruption or blocking of some ongoing action" (p. 98). Mandler, as well as other emotion theorists (e.g., Oatley & Johnson-Laird, 1987), stressed the adaptive function

of the link between arousal and attention to discrepancies. The link functions to establish immediate resolution or future avoidance (see Bower, 1992). For example, Mineka (1992) suggested that vigilance for sources of threat, augmented by controlled procedures for directing attention away from the event (avoidance), can maintain fearful states on future occasions (see the earlier formulation of emotionally disordered memory by Williams, Watts, MacLeod, & Mathews, 1988). What is ultimately implied by such accounts is that, although unexpected events incur arousal and initially demand attention, the linkage of arousal and attention does not guarantee memory for the initiating events; memory also depends on how attention is subsequently controlled and where it is focused.

Among the first to address matters of attentional control during aroused states was Easterbrook (1959), who contended that increases in arousal are associated with a narrowing in the focus of attention. Later, several accounts of memory during emotional states seem to have combined the Easterbrook hypothesis with the idea that attentional capacity is reduced by arousal (see especially Hasher & Zacks, 1979). In summarizing his earlier work on both emotion and memory, Mandler (1992) stressed the limited capacity of consciousness as the important factor in emotion/memory interactions. His theory of memory makes the distinction between procedures for activating and procedures for elaborating: Activation is automatic, given an external stimulus, and establishes later feelings of familiarity, whereas elaboration requires conscious or deliberate activity and establishes the pathways for retrieval. His theory of emotion stresses two features: arousal and expressed value. The former is visceral and produces internal events, whereas the latter reflects cognitive appraisal and requires attentional capacity. Therefore, "The experience of emotion preempts the limited capacity of consciousness. . . . [When this occurs] other processes that require such capacity will be impaired" (Mandler, 1992, p. 99). Some variant of this position has informed research on emotion and memory for approximately two decades. In particular, memory researchers have emphasized impairments in attention-demanding procedures (e.g., organization and elaboration) that support performance on later tests of deliberate memory.

In short, the limitation on the focus of attention, central to all cognition, is also central to understanding interactions of emotion and memory. Internal stimulation, external stimulation, and related past stimulation all vie for attention; an increase in the strength or distinctiveness of one source should mean that others are less well attended. Therefore, research efforts should—and often do—concentrate on the focus of attention during episodes of possible emotional relevance. This approach has the parsimonious advantage of blending the findings of improved memory for events "in focus" and impaired memory for unattended aspects of experience.

MEMORY FOR EMOTIONAL EVENTS

The nature of memory for emotional events—naturally occurring or simulated—depends on the focus of attention in a variety of ways. When events are surprising and therefore arousing: (a) attention is drawn to the central aspects that elicit the arousal via an innate orienting response, (b) those aspects enjoy the retention advantage of physiological arousal, and (c) their distinctiveness incurs elaborative processing that increases the chance that they will later come to mind. These claims have been abstracted primarily from Christianson's (1992) and Reisberg and Heuer's (1992) reviews of both real-world studies of eyewitness memory and laboratory simulations. It is important to keep in mind, however, that the nature of the event itself is often used to classify the memory as emotional. Arousal is sometimes assumed, rather than measured, and when arousal can be assumed it is not necessarily accompanied by an evaluative component that, according to Mandler (1992), constructs an emotion. This issue arises in the ensuing synopses of research on eyewitness memory, flashbulb memory, and repressed memories.

Eyewitness Memory

Based on the Easterbrook hypothesis, Christianson (1992) and Reisberg and Heuer (1992) argued that arousal restricts the focus of attention to the central details of presumably emotional events and therefore away from peripheral aspects, and thereby produces corresponding facilitation and impairment in memory for the respective aspects. Naturalistic studies of eyewitness testimony frequently show high positive correlations between judged emotionality (in retrospect) and both the reported vividness of the events and accurate memory for their central details. In such studies, however, evidence regarding accuracy is typically obtained through comparisons across repeated tests (with all the accompanying potential confounds) and lacks the appropriate controls. Laboratory simulations have produced somewhat inconsistent results, but the inconsistency might be artifactual of whether accuracy or error is measured. In the latter case, findings of poor memory for arousing events might be due to confabulations to fill in the gaps established by the narrow focus of attention (see Reisberg & Heuer, 1992). On balance, both reviews conclude that laboratory findings are consistent with the attentional-focus account.

Orientation to the central details of arousing events cannot, however, be solely responsible for enhanced memory, according to Christianson (1992). When eye fixations were controlled during initial exposure to emotional or neutral slides, memory for the fixated details was enhanced by emotional content. These findings suggest that ANS arousal and accompanying hormonal changes increase retention (see Gold, 1992). Christianson also pro-

posed that ongoing arousal might underlie findings of poor performance on immediate tests, due to "the difficulties in refiring of those neurons that are firing repeatedly in the reverberating circuit" (p. 299). In a related vein, Reisberg and Heuer (1992) suggested that the physiological effects of arousal on encoding ultimately slow the rate of forgetting central details. Physiological products of arousal might therefore account for findings of better memory for emotional events only after a delay in testing.

Long-term retention of emotional events might also be facilitated by their distinctiveness, according to both reviews. For example, Christianson (1992) noted that the role of distinctiveness is separable from that of emotional arousal, because parallel findings are obtained with nonemotional but unusual events. The role of distinctiveness, in the sense of the unexpected, however, might not be separable from that of physiological arousal and accompanying retention via ANS mechanisms (see Bower, 1992). Therefore, it might be more important to separate effects of distinctiveness from those of elaboration. When distinctive events are elaboratively processed (compared to when they are not), we typically see a greater advantage on tests of deliberate remembering (Hunt & McDaniel, 1993). Furthermore, the degree of elaborative processing might be limited by the focus of attention on one's aroused state.

In that regard, it is interesting to consider the recent analysis of eyewitness memory for traumatic events by Yuille and Tollestrup (1992). In a manner consistent with Mandler's framework, these authors argued that arousal accompanying "remarkable" events is sometimes associated with an internal focus on the physiological state itself. Under those circumstances, even memory for central details should be impaired. Laboratory research should therefore investigate the conditions that differentiate internal from external attentional foci. This issue is also relevant in investigations of another class of remarkable events: flashbulb memories.

Flashbulb Memories

Flashbulb memories are supposed to be emotional. In fact, a recent volume of papers on the topic was entitled *Affect and Accuracy in Recall* (Winograd & Neisser, 1992). Brown and Kulik (1977) coined the term *flashbulb* to refer to personal memories of finding out about culturally important events (such as the assassinations of public figures) and claimed that surprise and expected consequentiality of the event are their identifying characteristics. These two characteristics have been inconsistently measured (and usually in the absence of appropriate controls), but when they do co-occur the phenomenon might qualify as an emotional memory according to Mandler's criteria (cf. Mandler, 1992). This is because surprise can be counted on to invoke arousal, and expected consequentiality suggests that the arousal is evaluated in a cognitive context. For example, in a recent multinational study, Conway et al. (1994) recruited subjects who were likely to vary in the extent to which the event

(Thatcher's resignation) would be perceived as important and potentially consequential. They found that the initially reported strength of emotional reaction mediated the formation of flashbulb memories *when* the initially perceived importance of the event was high. However, because none of these measures was taken at the time of reception we cannot be sure that the event itself was emotional. This is typically the case.

In general, evidence regarding flashbulb memories is difficult to interpret, at best (see Brewer, 1992). The tradition is to measure memory for the reception event (the subject's own experience) rather than the original event, presumably because people hear the news from others rather than witnessing it firsthand. (Otherwise, of course, the phenomenon would be eyewitness memory.) Reception events usually leave no permanent objective record; therefore, researchers are almost always in the position of measuring memory for a memory, and consistency is not the same as accuracy (see McCloskey, Wibble, & Cohen, 1988). Moreover, appropriate control events are hard to identify (see Brewer, 1992). Another interpretive difficulty is invited by lack of knowledge regarding the focus of attention during reception, although some evidence suggests that central details from the initial report are quite well remembered (see Christianson, 1992). Reisberg and Heuer (1992) suggested that attention is likely to be focused on other people, whose own emotional reactions are unexpected in the context of everyday relations.

Social aspects of *remembering* the flashbulb event were stressed by Loftus and Kaufman (1992); one's audience at the time of remembering directs the nature of the report. Such social functions also remind us that elaborative procedures can easily produce inaccuracies in memory for eyewitness and flashbulb events. In attending to related information (elaborating) during the flashbulb event or its rehearsal, we increase the likelihood that such information will be the focus of attention on subsequent occasions of remembering.

Finally, Brewer (1992) alerted us to consider distinctiveness to be a potentially potent variable in understanding flashbulb memories, given its importance in ordinary personal memories. Events that are considered surprising *and* personally important should undergo elaborative processing for the purpose of reconciliation, according to evolutionary frameworks (see Williams et al., 1988), unless the event is threatening and therefore sets the occasion for avoidance. Although they might sometimes evoke emotions, flashbulb events pose little or no personal threat, unlike the events assumed to be responsible for the next category of emotional memories.

"Repressed and Recovered" Memories

Eyewitness, flashbulb, and presumably repressed memories are all records of distinctive events, although the last category is surely more personally relevant and arousing (Loftus & Kaufman, 1992). Because records of the

original flashbulb (reception) event and previously repressed events are rarely obtainable, the conservative stance is to doubt the special status accorded to each class of memory phenomena, and particularly to doubt the accuracy of "recovered" memories of previously repressed events. Loftus (see Loftus & Kaufman, 1992) cautioned us to consider that recovered memories might be replete with error motivated by social context, just like flashbulb memories, and urged us to examine the social functions of such reports.

Compared to recovery, the concept of repression itself has received more attention by memory researchers (see the review by Holmes, 1990). According to Kihlstrom and Hoyt (1990), for example, repression functions to deny controlled access to prior experience, and this function suggests various attention-centered explanations. Guided by ongoing motives (see Simon, 1994), attention can be diverted from the traumatic event and reduce the degree of elaborative processing. Similarly, attention can also be diverted away from later cues for reminding. Kihlstrom and Hoyt (1990) argued that the person might initially be aware of unwanted thoughts produced by such cues and deliberately avoid thinking about them in ways more akin to intentional suppression than to repression. But through practice, they argued, suppression becomes automatic and resembles repression. In a different vein, Bower (1990) suggested that repressionlike failures could also result from retroactive interference by incompatible and much more common experiences in the same domain; later recovery would then arise from the use of appropriate retrieval cues in the therapeutic context. Like Loftus, however, he warned that distortions are likely. In these ways the focus of attention at the time of remembering accounts for repression and possible recovery or confabulation.

Therapists suspect repression when they observe emotional reactions that seem unusual in the client's current context and therefore suggestive of certain kinds of earlier emotional experiences. In this regard, Tobias, Kihlstrom, and Schacter (1992) argued that when emotional responses themselves reflect the effects of past experience, they belong to the category of implicit memory phenomena, because the subject does not intentionally invoke the past in making the response. Although some of the measures used experimentally to support this claim do not qualify as full-blown emotional reactions, they have affective characteristics. Johnson and Multhaup (1992), for example, reviewed studies in the mere-exposure effect on preferences for unfamiliar melodies and people; in Korsakoff patients, such effects are dissociated from recognition judgments. Tobias et al. (1992) described clinical case studies in which a variety of affectively related measures (e.g., judgments of emotional value) showed similar dissociations from traditional measures of intentional remembering. Furthermore, these examples in the literature on human memory are reminiscent of a variety of studies that used truly emotional responses by other organisms as evidence of prior learning. In this regard, LeDoux (1992) reviewed evidence for the "indelibility

of emotional memory" (p. 279). This evidence suggests that emotion *as* memory cannot be extinguished, even though the event that gives rise to the emotion might be forgotten.

Finally, perhaps the best developed model of emotion as memory in humans is Johnson's MEM (see Johnson & Multhaup, 1992). Johnson proposed that perceptual and reflective subsystems differentially contribute to affective experiences. "Recapturing affect [emotion as memory] depends on whether it is possible to reinstate the records of the initial processing that led to the initial affective response" (p. 58). If the initial episode was not elaborated in the reflective subsystems, failures in deliberate recall are likely. However, perceptual characteristics of a current context that are similar to those of an earlier traumatic event certainly could evoke arousal along a generalization gradient. Through practice, such arousal could be accompanied by diversion of attention. Moreover, a skillful redirection of attention during emotional episodes might have some small chance of recovering a repressed memory if perceptual memories are sought. In contrast, cuing via reflective subsystems invites dangers of elaborative distortions. In short, the concept of attention is central to understanding that truly traumatic experiences affect subsequent behavior in the absence of aware remembering (the hallmark of suspected repression). It may also be central to designing experimental analogues for the recovery of repressed memories.

Practical Guidelines

What can we tell the practitioner? Because arousal directs, narrows, or re-directs the focus of attention in presumably automatic ways, initial control may be difficult, if not impossible. Beyond that point, avenues for self-initiated and environmentally directed control should be examined, particularly in the context of understanding that motives direct attention. In describing the experimental psychologist's approach to understanding repression, for example, Bower (1990) compared it to motivated "unlearning" and forgetting. Presumably, most of us are motivated to remember what we were doing on some culturally important occasion and to forget more personally traumatic events (unless legal or retributive motives exist at the time). Clearly, the motivation to comply with instructions in nonemotional laboratory settings can guide attention during initial exposure and subsequently (see Bower, 1990), but is such control possible when the event is "emotional"? Issues arising from this question concern the effects of arousal on initiating and sustaining attention in ways related to one's motives (fulfilling intentions). For example, if the experience invokes conscious evaluation of arousal, attention should be hard to focus on peripheral aspects potentially relevant to one's prior intentions. In effect, the arousing event may establish new motives that direct attention to their service. Much the same might be said when emotional states are not established directly by the current event.

MEMORY IN EMOTIONAL STATES

There is a fine line between memory for emotional events and memory in emotional states. One way to draw it is to note whether the event produces the state (as is assumed in the research described above). When the state precedes the event to be remembered, I classify the phenomena as memory in emotional states. In this category, the event itself might be emotional (although verbal materials related to emotions often constitute the "events" in such research). If so, researchers usually are interested in mood-congruent and mood-incongruent memories. If not, research is aimed at understanding the conditions for impaired memory in emotional states. In both categories of research, a variety of complicating factors arises from the need to understand the state itself.

Sometimes research participants have been diagnosed as emotionally disordered, sometimes they are selected from nondiagnosed populations according to their responses on various mood inventories, and sometimes they volunteer to be placed in transient moods. To what extent do arousal and its evaluation characterize these states? Although some researchers in the area argue that experimentally induced moods are more intense, others make distinctions between mood and emotion on the basis that arousal characterizes only the latter (see Mandler, 1992). However, the degree of arousal surely varies according to the induction technique or the specific disorder, and within these categories as well. For examples of low arousal, consider endogenous depression without accompanying anxiety, or the lethargic states established by some induction techniques (see Revelle & Loftus, 1992). Regarding the focus of attention on one's aroused state, it is important to know that most clinical disorders are characterized by self-focused attention (see the review by Ingram, 1990). Some mood-induction techniques, however, seem to be characterized by experimental "demand" in ways that are irrelevant to one's state. Subjects might be cued by the nature of the induction to focus attention on particular materials or encouraged to conform to implied expectations for poor attention and performance. (We should also be alert to demand characteristics of some selection procedures.) As well, there are reasons to believe that effects established by inductions differ from those in natural states (e.g., Hertel & Rude, 1991b). That possibility, coupled with a concern for practical value, has led me to emphasize studies on naturally occurring emotional states and disorders in the following description.

Emotion-Congruent Attention and Memory

The ensuing description is guided by Williams et al.'s (1988) evolutionary perspective on attention and memory in anxious and depressed people, because it was developed to address clinical phenomena in the context of traditional cognitive research. The main idea is that anxiety evolved to fa-

facilitate detection and subsequent avoidance of potential threat, whereas depression evolved to facilitate reflection on loss and failure. In cognitive terms, "anxiety preferentially affects the passive, automatic aspect of encoding and retrieval, whereas depression preferentially affects the more active, effortful aspects of encoding and retrieval" (Williams et al., 1988, p. 173). The term *preferentially* is the key to understanding emotionally congruent biases in attention and subsequent memory.

Recently, Mathews and MacLeod (1994) reviewed evidence that anxious people have trouble ignoring or inhibiting emotionally congruent aspects of events and show selective detection of these aspects. (Such biases are found in the performance of depressed subjects only to the extent that anxiety is also present.) The bias seems to emerge when the emotional nature of the materials varies within trials, not across, which suggests that the nature of the bias is to prioritize detection. In anxiety the bias is automatic rather than intentional, because it occurs when subjects cannot report the content (e.g., in studies using masked Stroop techniques).

Mathews and MacLeod's (1994) review also concluded that self-referential tasks performed at initial exposure produce better recall for congruent material, but only when they are performed by depressed people. This effect is usually attributed to elaborative processing, achieved by focusing attention on related thoughts and events, particularly when they are perceived as "causally belonging" to one's mood state (Bower, 1992). Elaboration establishes attentional procedures whereby the event can be deliberately brought to mind on later occasions. In fact, evidence of emotional congruence in depression seems to be restricted to performance on tests of deliberate remembering (e.g., Denny & Hunt, 1992). Implicit memory tests—to the extent that they invite more automatic procedures—might be expected to show emotionally congruent effects with anxious subjects (see Williams et al., 1988), but the few studies that have done so have not been replicated (also see Mineka, 1992).

In general, Mathews and MacLeod found no solid evidence for threat-congruent memory in anxiety. This is to be expected if anxious people subsequently focus attention away from detected sources of threat, both during initial exposure and on later occasions, in order to avoid further arousal. Indeed, sometimes impaired memory for threat-related materials is found. The consequence, according to Mineka (1992), is that in natural environments the lack of controlled attention to the source of potential threat prevents an accurate evaluation of its extent and perpetuates anxiety. On the other hand, depression might be exacerbated by attention to negative aspects of current and prior experience (see Williams, 1992).

Depression is characterized by automatic negative thoughts and ruminations (see Beck, 1976; Gotlib, 1992). Ruminations involve sustained attention that is presumably motivated by the urge to resolve discordance associated

with the negative thought and to escape the depressed mood. These implicit goals, however, may be almost impossible to reach when the content of the automatic thought is particularly traumatic. Then, the person is motivated to suppress such unwanted thoughts, because they ultimately serve to exacerbate the mood. (Evidence for mood-incongruent recall of less traumatic negative materials may have similar roots in mood regulation; see Parrott & Sabini, 1990.) According to Wegner (1989), thought suppression is achieved initially by focusing attention on random distractors in the environment; however, through repeated attempts and failures, these distractors become associated with the unwanted thoughts and (ironically) serve to cue them. This “rebound” effect appears to be stronger for emotionally charged and unresolved events than for neutral content.

Wegner's (1989) treatment of the rebound effect places it in the category of implicit memory paradigms. The thought comes to mind in the absence of intent to remember—indeed, in the presence of the intent *not* to remember. As such, when past events come to mind against one's will, the memory process can truly be described as automatic (Jacoby, Toth, & Yonelinas, 1993). In this regard, the rebound effect shows evidence of mood congruence (e.g., Howell & Conway, 1992), unlike other paradigms that presumably measure implicit memory.

Impaired Memory

Although depressed people are bothered incessantly by automatic negative thoughts, they complain about poor memory. What they mean is that their deliberate attempts to remember often fail. Indeed, there is little reason to notice that memory functions “normally” in more automatic or implicit ways (provided that the original event had been attended; see Hertel, 1994; Hertel & Hardin, 1990). Similarly, the literature on memory impairments in both anxious and depressed states has concentrated on tests of deliberate remembering. Consider first the case of anxiety.

Anxiety might indeed establish priorities for detecting and subsequently avoiding threatening events, but how should it affect memory when threat is absent? In line with Easterbrook (1959), Eysenck (1982) noted that anxious arousal might impair memory by narrowing the focus of attention during initial exposure in ways that exclude important aspects of more attention-demanding tasks. When arousal has been measured, however, it seems to have contributed little to the relationship between anxiety and performance (see Eysenck & Calvo, 1992). Further, Eysenck and others also noted that arousal is just one component of anxiety. The other component—worry—represents the focus of attention on self-relevant and typically distracting information. Although distraction should impair subsequent memory, anxious subjects sometimes compensate for their distractibility by increasing the

effort they expend on the task, because they are motivated to avoid the negative consequences of failure. (In other words, imagined failure can be a source of threat to be avoided by anxious people.) In this regard, Eysenck and Calvo (1992) proposed that processing efficiency (a ratio of effectiveness to effort) is impaired; anxious people expend more effort to maintain a certain level of effectiveness and are therefore less efficient (see Eysenck & Calvo, 1992, for a review of the relevant literature).

This account of performance in anxious states is both similar to and different from typical accounts of performance in depressed states. Both stress the importance of attentional factors, but the latter suggest that depression limits the degree of effort that *can* be applied to cognitive tasks (e.g., Hasher & Zacks, 1979; Williams et al., 1988). (Some research in social cognition is much more consistent with Eysenck & Calvo's framework, however; the review by Weary, Marsh, Gleicher, & Edwards, 1993, suggests that depression is associated with *increased* effort, motivated by the desire for control.)

In one of the more frequently cited accounts of depression and memory, Ellis and Ashbrook (1988) claimed "that being sad ties up some capacity as a result of thinking about one's sad state, so that less capacity is available to be allocated to the criterion task" (p. 27). Their support for this assumption was provided by evidence of impaired recall of materials from more difficult or attention demanding tasks. The key factor in their claim, however, is not "tied-up" or reduced capacity, as stressed by the authors and others (e.g., Hartlage, Alloy, Vazquez, & Dykman, 1993), but the embedded assumption regarding the focus of attention. The experimental support described earlier, for example, was established by mood-induction techniques; in the "depressed" condition, college subjects read statements designed to focus their attention on feeling sad, hopeless, and lethargic. Subsequent experiments on thought listing following such inductions in fact showed that this attentional focus was maintained during a criterion task (Seibert & Ellis, 1991). Therefore, neutral and self-irrelevant materials from "orienting" tasks are peripheral to the focus of attention and should suffer on later tests of deliberate memory, as can be seen in studies of memory for emotional events (see Christianson, 1992).

Can we assume that attention is similarly focused away from neutral aspects when the subjects are naturally depressed? Unwanted thoughts tend to occur on occasions when the mind is not otherwise occupied (Bower, 1992; Wegner, 1989). Such occasions include those during which there is little environmental control of attention, such as Bower's example of falling asleep at night. Probably a large proportion of tasks used in memory research poorly controls the focus of attention. For example, because we generously provide time for subjects to perform incidental orienting tasks, their minds can wander until the next display. Some subjects, however, do show what my colleagues and I have called "cognitive initiative" (see Hertel & Hardin,

1990); they continue to focus attention on the task and related materials in ways that are not required by our instructions. Later, during recall and recognition tasks, we do not tell subjects precisely what to think about, but some subjects voluntarily attend to elements of the past and present that help them perform. Some subjects behave strategically. Of course, these are the processes we want to bring under experimental control so that we can establish their causal importance, but when experimental constraints are imperfect, performance varies as a function of the degree to which such processes are self-initiated. Depressed and dysphoric people are among those who initiate the least.

Depressed subjects comply with stated instructions, but during periods of loose attentional control their minds go blank or wander to task irrelevant matters—perhaps to matters of personal concern. Compared to our typical laboratory tasks, such matters motivate attention. Furthermore, if the focus of attention, rather than reduced capacity, is the key to understanding memory impairments in depression, we ought to be able to sidestep the need for initiative by controlling the focus of attention on the task and thereby reduce or eliminate the impairment. Consider the following experiment with clinically depressed subjects and controls (Hertel & Rude, 1991a). In one condition, attention during the orienting task was poorly constrained (as it was in the research cited by Ellis & Ashbrook, 1988), and subsequent free recall of targets from the more difficult trials was reduced in the depressed sample. In another condition, however, we constrained attention during initial exposure and eliminated the deficit in subsequent recall. The depressed sample performed more slowly on a secondary task during both orienting conditions, and so low task motivation or even reduced capacity might characterize their state. Regardless, the important point is that so-called capacity limitations did not predict recall when initiative was not required.

In the experiments by Hertel and Rude (1991a, 1991b), recall was most likely determined by the degree of initial elaboration (attention to the target's context). Free recall is the classic test of deliberate memory; it encourages a good deal of focus on past events and therefore benefits from such focus during initial exposure (see Jacoby et al., 1993). In contrast, word-identification tests that indirectly measure prior experience (i.e., more old than new words are identified at brief exposures) benefit primarily from prior integration of letters into words. Procedures for activating lexical units are assumed to be automatic under normal reading conditions. Instructions to attend to the perceptual features of the word's display, however, are not normal reading conditions, and under these conditions reading should require some initiative. In this regard, the performance on a subsequent test of word-identification revealed a decreased effect of prior exposure in the depressed sample, compared to the controls (Hertel, 1994). During the perceptual orienting task, the depressed subjects apparently attended less often to the

words themselves, because such attention was not required. When the orienting task had instructed them to judge the emotional value of the words, however, the effect of prior exposure on word identification was comparable to that in the control group. In this case, reading was required and other potentially self-initiated procedures during initial exposure would not be expected to improve performance on the test of word identification. Moreover, this and other indirect memory tests are probably less likely to invite self-initiated reflections on the past. For example, a test of homophone spelling showed no depression-related effect of prior exposure to one of the two meanings of each homophone (Hertel & Hardin, 1990).

Compared to indirect tests, recognition tests provide more interesting opportunities for exploring the possible effects of impaired initiative in depression—particularly with regard to the control of attention during the test itself. For example, compared to controls, dysphoric students have shown impairments in recollection—the component of recognition judgments that represents a self-initiated focus on the past context of target items—but comparable reliance on familiarity, the more automatic aspect of recognition (Hertel & Milan, 1994). Further, in our earlier research on recognition, only the nondysphoric subjects appeared to focus attention systematically on remembering the target's context in two prior tasks and to discount familiarity as a basis for judgment (Hertel & Hardin, 1990). When, in a subsequent experiment, we guided the dysphoric subjects to use that attentional strategy, their recognition judgments revealed the same pattern that characterized the unguided judgments by their nondysphoric counterparts. Other studies also support an initiative account of recognition in depressed states (e.g., Channon, Baker, & Robertson, 1993).

Reduced cognitive initiative in depressed states is consistent with symptoms of hopelessness (Abramson, Metalsky, & Alloy, 1989) and perceived lack of control of both internal and external events (Beck, 1976). It can also be understood in neurophysiological terms. In particular, a connection between depression (as well as other emotional disorders) and attentional control should be found in frontal-lobe hypoactivation (see Grafman, 1989). According to Henriques and Davidson (1991), "loss of initiative, impaired concentration, indecision . . . are all symptoms common to patients with left anterior lesions and certain subtypes of depression" (p. 535). Their evidence from EEG recordings of clinically depressed (unlesioned) subjects lends further support to this connection. Mayes (1988) concluded that patients with lesions in the frontal lobes exhibit deficits that "arise when remembering requires the initiation and maintenance of effortful and organized strategies . . . as well as the ability to switch from one strategy to another" (p. 121). In PET studies, hypoactivation in the frontal lobes has been linked to both depression (Resnick, 1992) and reduced attentional control (Posner, 1992). In the context of frontal-lobe hypoactivation, moreover, other brain functions

can continue to direct attention and mediate retention of emotionally relevant events (McGaugh, 1992).

In short, at least some evidence from varied research domains paints a picture of depressed people as those who readily attend to emotionally negative events, ruminate about them in ways that exacerbate their depression, and are not motivated to attend to other matters that might not only benefit performance on subsequent memory tasks but aid recovery (see Hertel, 1992). Rather than insisting that this picture is inevitable (e.g., by stressing that depression reduces capacity), however, we should realize that in matters of attentional control, depressed people need a little help from their friends—or at least from their therapists.

Practical Aspects of Memory in Depressed States: Implications for Treatment

The most obvious and perhaps the most frequently discussed avenue for applying research on depression and memory lies in the clinical domain—particularly in the practices of cognitive-behavioral therapy (see Beck, Rush, Shaw, & Emery, 1979). Although this tradition has been “cognitive” only in the loosest sense of the term, recently some attempts have been made to connect the practices with experimental findings and theories in cognitive psychology.

First, experimental evidence regarding the tendency to focus attention on negative aspects of current and prior experience can be used in assessment. For example, vulnerability to depression might be better detected in performance on cognitive tasks than in self-reports (Williams et al., 1988). Similarly, Nasby and Kihlstrom (1986) discussed applications to assess the potential usefulness of particular interventions. Therapists should also take evidence for mood congruent recall into account in evaluating the client's autobiographical reports.

More typically, evidence for biased attention and recall in depression has been related to treatment domains. For example, cognitive-behavioral therapy includes procedures to alter negative thoughts by encouraging clients to use their own behavior to test their beliefs (Beck et al., 1979). In a closer analysis of how that might work, Ingram and Hollon (1986) suggested that such self-monitoring procedures tend to be freer from distortions than is retrospective recall; the results of monitoring can then be elaborated during therapy sessions. In that setting, moreover, Nasby and Kihlstrom (1986) recommended that therapists optimize attention to their feedback by placing clients in happier moods prior to reinterpreting their behavior in less negative terms than the client tends to use.

Evidence for mood-incongruent recall and the suppression of negative thoughts is also relevant to treatment, particularly if one switches therapeutic

horses to psychodynamic perspectives. When such mechanisms of "defense" seem ineffective, the therapist might be inclined to encourage clients to reveal early traumatic experiences. Although, as previously described, attempts to recover presumably repressed memories are fraught with reconstructive dangers, Harber and Pennebaker (1992) advocated procedures for encouraging the revelation of suppressed (if not repressed) thoughts. They argued that, in the long run, by virtue of associated increases in ANS and CNS activity, thought suppression is a biological stressor that produces a range of health problems and various cognitive side effects (e.g., stressful dreams). "Confrontation" (by attending to the suppressed memory) should therefore reduce these effects. Support for this latter claim mainly comes from experiments in which college students are randomly assigned to write or speak about either traumatic or mundane events from the past. Outcomes in the "trauma" groups include a subsequently reduced number of physical complaints. With respect to depression, Harber and Pennebaker implied that disclosure should alleviate general distress by focusing attention on the traumatic memory in the presumably safer context of their present lives.

Finally, compared to applications of research on emotionally biased cognition, the literature contains many fewer attempts to address general impairments in depression. One of the few, by Watts, MacLeod, and Morris (1988), documented the remediation of memory and concentration difficulties through imagery training, although subjects did not report a subjectively experienced benefit and therefore might not initiate the procedures in the absence of instructions. In fact, as noted by Williams et al. (1988), there has been little research regarding transfer of remediative strategies outside the therapeutic or experimental setting.

General impairments in depression are typically noted along quantitative dimensions (e.g., fewer words recalled); however, qualitative aspects of recall might be equally important for therapeutic applications. In that regard, Williams and his colleagues (see Williams, 1992) found that the proportion of *specific* memories reported in autobiographical protocols was smaller in groups of patients diagnosed with major depression than in various control groups. Furthermore, this tendency toward overgeneral memories did not depend on the degree of the patients' current mood disturbance. Therapists should, therefore, not assume that overgeneral recall will disappear when mood is temporarily better. Instead, Williams argued, therapists should try to change the processes leading to overgeneral recall. Therapy for depressed clients should include: practice in noticing the tendency toward overgeneral recall, training in procedures for remembering specific aspects of both positive and negative memories (so that the former can be elaborated and the latter reinterpreted), and using diaries for recording specific details, to aid attention at the outset. More generally, Williams (1992) advocated the development of strategies that transfer to nontherapeutic settings.

Cognitive-behavioral therapy sometimes includes "behavioral activation strategies" that are designed to transfer to the real world (Ingram & Hollon, 1986). Specific procedures (e.g., graded tasks) are designed to produce success through the environmental control of attention. Other therapeutic procedures are designed to teach clients to initiate controlled procedures through practice in doing so. And preparation for termination of therapy emphasizes that the skills gained in therapy can be used for future control. Ultimately, such procedures should, according to Ingram and Hollon (1986), decrease self-focused attention that has become maladaptively strong in depressed clients. Moreover, they clearly illustrate that refocusing attention is the key to therapeutic intervention and implicitly assume adequate attentional capacity. The central question, however, is whether the procedures can be initiated during future times of distress, when potentially more powerful motivations guide the focus of attention, impair memory for unattended aspects, and reinstate the depressive state.

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