

# INVESTIGATING ALTERNATIVE ACCOUNTS OF VERIDICAL AND NON-VERIDICAL MEMORIES OF TRAUMA

Jonathan W. Schooler<sup>1</sup> and Ira E. Hyman, Jr.<sup>2</sup>

<sup>1</sup>University of Pittsburgh  
635 LRDC  
Pittsburgh, Pennsylvania 15260  
<sup>2</sup>Western Washington University  
Bellingham, Washington 98225

## 1. INTRODUCTION

We summarize the discussions of the two Cognitive Working Groups of the NATO ASI meeting on memory and trauma. The groups found that an understanding of the processes that contribute to veridical and nonveridical memories of trauma will require clarification of the relationship between clinical and cognitive constructs, and a variety of research approaches. The groups concluded that advancement will require greater communication and collaboration among researchers interested in memory of trauma

This report represents the summation of discussions of two working groups that met at the NATO workshop on memory and trauma to consider cognitive and neurocognitive research issues. As it happened, the two groups adopted different, but complimentary, approaches. One group (hereon called Group A) took a conceptual approach, identifying central clinical constructs and considering how they might relate to existing cognitive and neurocognitive ideas. The second group (hereon called Group B) took a more research oriented approach, breaking the issues down into general research domains and identifying specific research questions and methodologies within each domain. A fortuitous consequence of the distinct approaches taken by the two groups is that they lend themselves to sequential consideration, with Group A's analysis identifying a number of key conceptual issues that are then fleshed out by specific research suggestions by Group B. In this chapter, we summarize the discussions of the two groups and then close with several general observations about the strategies and goals that we believe productive research on this topic might profitably adopt.

## 2. COMPARING CLINICAL AND COGNITIVE CONSTRUCTS

Group A took as its starting point the premise that successful research endeavors require the clear definition and operationalization of the constructs in question. Unfortunately, such clarity of constructs has been sorely lacking in discussions of recovered and fabricated memories of trauma. Clinical and cognitive psychologists often use different terms and, worse yet, use the same terms but with different meanings. This state of affairs suggests that an important step is the development of a common terminology and the assessment of the relationship between pertinent clinical and cognitive constructs. Towards this end, Group A explored the relationship between cognitive psychological theory and four constructs that have been central in clinical discussions of memory for trauma: the sensory/narrative memory distinction, repression, dissociation, and PTSD.

### 2.1. The Sensory/Narrative Memory Distinction

A common clinical claim dating back as far as Janet (1889) is that some traumatic memories are often recollected in a purely sensory form "without any semantic representation... experienced primarily as fragments of the sensory component of the event" (van der Kolk & Fessler, 1995, p. 513.) In contrast, other traumatic memories are incorporated into a narrative framework that involves symbolic verbal interpretations of experience. Sensory/affective and narrative memories of trauma have been speculated to differ with respect to their formation, susceptibility to change, and retrieval conditions. Sensory memories have been hypothesized to form under conditions of severe trauma, be relatively invulnerable to change, and be invoked automatically in response to certain environmental cues. In contrast, narrative memories have been hypothesized to form under less severe trauma conditions, be more vulnerable to change, and be retrieved volitionally (for a review see van der Kolk & van der Hart, 1991.)

Claims associated with the sensory/narrative memory distinction share both similarities and differences with a variety of cognitive constructs. For example, many cognitive models posit distinctions between sensory/perceptual processes and verbal/conceptual processes (e.g. Atkinson, Herrmann, & Westcourt, 1974; Paivio, 1986; Jacoby & Dallas, 1981, Mandler, 1980.) Indeed, this distinction seems fundamental to many information processing models and continues to be popular, (though there is certainly plenty of variation in how sharply the distinction is drawn and in the precise manner in which the two types of knowledge are presumed interact.) Although such models share the assumption that it is useful to distinguish between perceptual and verbal memory representations, these models differ from the sensory narrative distinction in a number of important respects. For example, in contrast to the assumptions of sensory traumatic memories, standard cognitive models assume that sensory/perceptual memories are not exclusively generated under extremely arousing conditions. Many (e.g., Paivio, 1986) standard cognitive models also differ in that they assume that perceptual memories can be volitionally retrieved. However, this premise is not shared by all theories, as some cognitive theories (e.g., Jacoby & Dallas, 1981) suggest that perceptual memories may be under less volitional control than conceptual memories. Finally, unlike the sensory/narrative distinction many cognitive theories assume that perceptual memories are formulated in addition to rather than instead of more verbal explicit knowledge (e.g. Paivio, 1986.) However, once again this assumption varies across theories with other theories suggesting that implicit perceptual memories can be formed in the absence of explicit verbal memories (see discussion of implicit memory below.)

Another partial mapping between cognitive theory and the sensory/narrative distinction is the notion that sensory memories are exclusively elicited by encoding cues that, in some manner, resemble the trauma experience. This premise resembles in some respects the cognitive principle of encoding specificity (Tulving & Thompson, 1973), which states that memory performance is maximized when retrieval conditions approximate encoding conditions. Like claims of sensory memory retrieval, encoding specificity predicts that cues similar to the trauma experience could prompt recollection of trauma. This claim is mirrored by the related construct of state dependent memory (e.g., Eich, 1980) which holds that memories are most apt to be retrieved when individuals are in similar states (e.g., sad) during encoding and recollection. However, in contrast to the sensory/narrative traumatic memory distinction, which assumes that environmental cues are uniquely relevant to the retrieval of particularly traumatic sensory memories, the encoding specificity principle is not exclusively limited to traumatic nor sensory materials, and indeed most demonstrations of encoding specificity have involved semantic associations with rather mundane materials.

A third cognitive construct that bears a resemblance to the sensory/narrative memory distinction is the frequently used cognitive distinction between implicit and explicit memories. Implicit memories correspond to memories that influence performance without awareness, whereas explicit memories involve conscious recollective experiences (for reviews see, Roediger, 1990; Schacter, 1987; Schacter, Chiu, & Ochsner, 1993.) Over the last 20 years cognitive psychologists have amassed substantial evidence that implicit memory can influence behaviors without conscious recollection. Moreover, like sensory memories, implicit memories are hypothesized to involve perceptual knowledge, be exclusively prompted by environmental cues, and to be relatively less vulnerable to disruption. Indeed, implicit memories have been shown to be extremely sensitive to the fine grained perceptual characteristics of stimuli. Explicit memories also bear some resemblance to the sensory/narrative distinction. Like narrative memories explicit memories are hypothesized to emphasize semantic/conceptual knowledge, to be more vulnerable to disruption, and to be volitionally recalled. These parallels have led some clinicians to use the two constructs interchangeably (e.g., van der Kolk & Fisler, 1995.) However, Group A observed a number of important differences between the implicit/explicit and sensory/narrative memory distinction that suggests caution in drawing parallels between them. For example, in contrast to the alleged vivid experiential quality of sensory traumatic memories, the phenomenological quality of implicit memories is quite subtle (e.g. slightly increased perceptual fluency or familiarity), if it is perceived at all (cf. Jacoby, Kelley, & Dywan, 1987.) Implicit memories also differ from sensory narrative memories in that they can be conceptual as well as perceptual (cf. Roediger, Weldon, & Challis, 1989.) Moreover, in contrast to the characterization of sensory trauma memories, implicit memories can be generated in response to even the most mundane of experiences. In addition, unlike sensory memories which are hypothesized (at least sometimes) to become integrated into narrative memories (i.e., recovered), implicit memories are generally not believed to transform themselves into explicit memories. (Although it is possible that one could have access to implicit memories but not explicit memories under one set of conditions, yet be able to retrieve the corresponding explicit information if properly cued.)

A final, albeit controversial, construct in the cognitive literature that bears a resemblance to the sensory narrative distinction, is the hypothesized distinction between standard autobiographical memories and flashbulb memories of very emotionally salient experiences (Brown & Kulik, 1977). Like sensory traumatic memories, flashbulb memories are hypothesized to be very vivid, sensorially rich, and relatively invulnerable to

change and forgetting. Indeed, a further similarity between flashbulb memories and sensory traumatic memories is that flashbulb memories' status as uniquely inviolate memories has also been questioned (e.g., Neisser & Harsch, 1992, showed a high proportion of large errors in supposedly flashbulb memories). However, even if we grant the possibility that flashbulb memories do exist, they still have a number of fundamental differences from sensory traumatic memories. Unlike sensory memories, flashbulb memories are volitionally recalled and easily recounted in the context of a narrative memory. Indeed, one explanation for why flashbulb memories seem so vivid is that they are so frequently rehearsed in the context of narrative discourse (Neisser, 1982).

In sum, after significant consideration of the sensory/narrative distinction, it was concluded that although the distinction shares some similarities with a number of cognitive constructs, there is no construct within cognitive psychology that adequately captures all of the characteristics hypothesized to be associated with sensory traumatic memories. This disparity caused some in Working Group A to express skepticism towards the construct of unique sensory memories, and in particular towards the claim that sensory memories are especially invulnerable to change and distortion. Others however, viewed these disparities as further evidence of the uniqueness of sensory memories.

Although there was a lack of consensus in Group A regarding the likelihood that sensory traumatic memories qualitatively differ from more standard types of memories, there was general agreement that the status of sensory traumatic memories is a pressing research issue. More generally, the analysis of the sensory traumatic memories in the context of standard cognitive distinctions provided a powerful example of the lack of alignment between clinical and cognitive constructs. This disparity illustrated the need for clinical and cognitive psychologists to work collectively to develop systematic, research based, approaches for operationalizing and comparing their respective constructs.

## 2.2. The Construct of Repression

A second clinical construct that Group A considered from a cognitive psychological perspective was repression. Group A noted a variety of opinions regarding what repression means and what types of memory behavior constitute evidence of repression. Sometimes repression is used as a label for the forgetting of traumatic experiences. Other times it is used to define a particular mental mechanism involving an often complex constellation of forgetting, storage and remembering processes. Moreover, even within each of these usages there is considerable lack of agreement. When used as a label for a type of forgetting, repression can refer to the forgetting of any unwanted memories, or limited to the forgetting of severely traumatic memories, or limited to the forgetting of repeated incidents of severe trauma. Similarly, when used as a specific mechanism of forgetting, repression can involve a variety of different processes. Repression mechanisms are sometimes characterized as being intentional and other times as being automatic. Repression has been postulated to cause the immediate forgetting of trauma, but it has also been suggested to operate over an extended period of time. In addition to these seemingly contradictory characterizations of the mechanisms underlying repression, there is also a significant subset of assumptions that sometimes are, and sometimes are not, viewed as defining properties of the repression mechanism. Examples of such claims include: 1) repressed memories are entirely unavailable; 2) repressed memories are maintained in a pristine uncontaminated form; 3) although forgotten, repressed memories nevertheless cause a specific set of mental disturbances; 4) these mental disturbances are so distinctive that their presence can reliably be used to diagnose the existence of repressed memories;

5) repressed memories are only retrieved when the ego is capable of coping with the disturbing recollection; 6) repressed memories are uniquely responsive to memory retrieval therapies, and; 7) these various attributes of repressed memories are the consequence of special ego defense mechanisms that are distinct from standard memory processes.

With respect to the notion that repression involves special ego defense mechanisms, it was noted that the operationalization of such processes remains difficult and that despite substantial effort, little direct cognitive evidence for such mechanisms has been produced. Nevertheless, clinical suggestions of such mechanisms continue to be generated (see Brewin, this volume, and Briere, this volume) and thus further efforts to cognitively pin down unique repression mechanisms seems warranted. At the same time however, group A noted a variety of more standard cognitive operations that individually or in combination might account for the forgetting and remembering of trauma without the postulation of special repression mechanisms. These include: lack of verbal rehearsal (e.g., Atkinson & Shiffrin, 1969, Nelson, 1993), delay (e.g., Ebbinghaus, 1913), directed forgetting (e.g., Bjork, 1989), re-interpretation (e.g., Anderson & Pichert, 1978), encoding specificity (e.g., Tulving & Thompson, 1973), state-dependent memory (e.g., Eich, 1980), thought suppression (Wegner, 1994), and hypermnesia (e.g., Erdelyi & Kleinbard, 1978.) In addition, it was noted that both post-event suggestion (see Loftus, this volume) and other types of source confusions (e.g., Johnson, Hashtroudi, & Lindsay, 1993) are likely to contribute to the generation of non-veridical memories of abuse.

Group A concluded that a scientific assessment of repression will require a much clearer operationalization of the construct, with a precise specification of its hypothesized conditions and processes carefully considered in the context of basic cognitive constructs. Only then will it be possible to determine whether, and to what degree, repression represents a unique memory mechanism that is distinct from more standard cognitive operations.

### 2.3. Dissociation

Another clinical construct that Group A considered particularly apt to benefit from cognitive analysis is the notion of dissociation. As with repression, the construct of dissociation has been associated with a number of different meanings. However, unlike repression, there seems to be some consensus regarding the alternative appropriate usages of the term. Specifically, three common usages were identified: 1) the intentional dissociation of oneself from unpleasant experiences (e.g., I imagined I was somewhere else while it was happening); 2) experiential distortions during encoding, (e.g., the experience seemed a like a dream) and; 3) memory for experiences becoming partitioned from one another (i.e., the alleged amnesia associated with multiple personality disorder and fugue states.) Group A noted the dearth of cognitive research into the construct of dissociation in the context of memory for trauma and identified several areas for further research. One important step will be determining the cognitive constructs that might relate to dissociation. Potentially related cognitive constructs include divided attention (e.g. Jacoby & Dallas, 1981, Spelke, Hirst, & Neisser, 1976), daydreaming (Singer, 1993), thought suppression (Wegner, 1994), and the tendency of some autobiographical memories to be recalled from the third person perspective (Nigro & Neisser, 1983.) A second important consideration is assessing the impact of dissociation on both actual forgetting (see Eich, this volume) and memory fabrication (Hyman et al. 1996.) In addition, an understanding of the cognitive underpinnings of dissociation would also benefit from further specification of the relationship between the various forms of dissociative experiences mentioned above and other related clinical constructs such as hypnosis (e.g., Hilgard, 1992) and absorption (Tillegen & Atkinson, 1974).

## 2.4. Post-Traumatic Stress Disorder

A final clinical construct that Group A sought to clarify from a cognitive perspective was Post Traumatic Stress Disorder. PTSD diagnosis requires the encountering of trauma and the subsequent symptoms of re-experiencing symptoms (e.g., intrusive memories), protective reactions (e.g., emotional numbing, amnesia), and arousal symptoms (e.g., hypervigilance.) One issue upon which there was marked differences of opinion was whether PTSD symptoms can be viewed as a useful indicator that recovered memories correspond to actual abuse experiences. Some suggested that the existence of PTSD symptoms in conjunction with recovered memories of abuse indicates exposure to some type of traumatic experience. Others, however, strongly objected to the use of clinical symptomatology in the assessment of the likely authenticity of recovered memories.

This discussion led to the formulation of a number of future research questions such as: Can PTSD symptoms accompany false memories (e.g., alien abductions)? If so, might such false recollections involve source confusions (e.g. Johnson et al., 1993) in which fragments of authentic and fabricated events become muddled together? Alternatively, might the formation of a false memory of a traumatic event itself be sufficient to elicit PTSD symptoms? Although little consensus on these issue was reached, there was general agreement that an understanding of the relationship between PTSD and memory will be an additional key component of a deeper understanding of the relationship between memory and trauma.

## 3. AN OVERVIEW OF RESEARCH DOMAINS

Group B focused on outlining some areas that would benefit from research by clinical, cognitive, and neurocognitive psychologists. The view of this group was that in order to understand the existing memory controversy, several areas of research need further examination. At the least, additional research is needed concerning how trauma affects memory, how the phenomenon of recovered memory occurs, how false memories are created, and how both adults and children can be asked about the past in nonleading fashions. These domains are not only important for disambiguating the current controversy, but also for applied concerns and for untangling theoretical issues. Several different methodologies will be useful in each of the different topic domains.

### 3.1. Memory for Trauma

Research on how trauma is remembered should help discriminate among several theories — repression theory arguing for memory loss, flashbulb theory arguing for better memory for trauma, and other theories suggesting more complex relationships between arousal and memory. Repression theory argues that when people experience trauma they are likely to place that memory in the unconscious until the anxiety is sufficiently relieved (Freud, 1915/1957). There are also several modern versions of special memory mechanisms, such as dissociative tendencies, that are thought to cause some traumatic events to be forgotten (or perhaps only be available as sensory rather than narrative memories.) How these mechanisms differ from repression and what predictions they make for traumatic memories needs to be more clearly defined.

In contrast to theories arguing for some form of memory loss, flashbulb memory theory (Brown & Kulik, 1977) claims that extremely emotional experiences are better re-

remembered than other experiences. In essence, during very arousing and important events, a special brain mechanism is activated and records a lasting record of current brain activity. Although several studies have shown surprisingly large errors in memories for such experiences (e.g., Neisser & Harsch, 1992), the idea that traumatic experiences tend to be very well recalled remains popular (e.g., Terr, Bloch, Michel, Shi, Reinhardt, & Metayer, 1996; Tromp, Koss, Figueredo, & Tharan, 1995).

Other theories have predicted more complex relationships between arousal and memory. For example, the Easterbrook Hypothesis makes a different prediction regarding the relationship between trauma and memory — namely that as arousal increases, attention narrows (Easterbrook, 1959). Thus as events become traumatic, less information will be attended to and subsequently available for recall. The loss of information will be noted particularly in peripheral features of the event. As still another idea about trauma and memory, Post-Traumatic Stress Disorder researchers have noted that memories of traumatic experiences may frequently be experienced as intrusive memories (e.g., Horowitz & Reidboard, 1992). Thus, there are several suggestions for how traumatic events will be recalled (or forgotten), but the existing research does little to discriminate among them.

Group B believed this was cause for an increased effort to study memories for traumatic experiences. Future research should emphasize memory for a variety of traumatic experiences, partly because there is no reason to assume that all trauma will affect memory in the same fashion. For example, some forms of traumatic experiences are shared and thus may be rehearsed while others are private. In addition, different forms of emotions (fear, shame, guilt, etc.) may accompany traumatic experiences and these emotions may have differing effects on memory. Future research should also consider individual differences related to memory for trauma: differences in what the individual brings to the experience (such as a history of trauma), in how the individual responds to the trauma (this might include immediate emotional, cognitive, and behavioral responses), and in the outcome of the traumatic experience (no long-term negative consequences compared with a variety of negative outcomes such as PTSD, depression, anxiety, or fear development.) In addition to studying how traumatic experiences are recalled, researchers should also continue to investigate how people who develop PTSD differ from others (e.g., Yehuda, this volume.) In order to better understand the effects of trauma on memory, baseline studies of other memories need to be conducted. For example, how well and how long are non-emotional, mildly emotional, strongly positive, and other comparison experiences remembered?

Research on trauma and memory will necessarily involve a variety of methodologies. Everything from animal studies to controlled laboratory studies with humans experiencing mild forms of emotion to naturalistic studies of memory for very emotional experiences will be needed. This domain of inquiry provides an opportunity for experimental researchers to collaborate with clinical practitioners to study how people remember extreme trauma.

### 3.2. Recovered Memories

Group B and the conference as a whole came to an agreement that people can forget and later remember a variety of experiences, including traumatic experiences. Unfortunately, there was less agreement concerning how that phenomenon occurs. Do recovered memories occur because people repress or dissociate memories for traumatic experiences? Are there other inhibitory mechanisms in memory, such as directed forgetting or partial-

list cueing (e.g., Anderson, Bjork, & Bjork, 1994), that account for forgotten and recovered memories? Does encoding specificity, the fact that events are retrieved in the presence of only particular cues, explain the recovery of some traumatic experiences? Or is it the case that people mistakenly believe that a memory has been unavailable for a period of time in which they actually discussed the experience (see Schooler's, this volume, "forgot-it-all-along effect")?

In this domain, there was agreement that more descriptions of recovered memories are needed. When dealing with recovered traumatic memories, researchers should attempt to document that the event occurred, that there was a period of non-memory, and how the memory was recovered. Although descriptions of recovered traumatic memories will aid in explaining the phenomenon, a description of the base rate of memory recovery experiences for other types of events (e.g., Read, this volume) and for a variety of traumatic experiences (e.g., Elliott, this volume) would help. Although much of this research will rely on surveys, there is the opportunity to study some of the basic mechanisms (such as directed forgetting, part-list cueing, encoding specificity, and the forgot-it-all-along effect) in controlled laboratory studies. In addition, as Brewin (this volume) has noted, there may be individual differences in inhibitory processes. These differences can be studied in both laboratory and naturalistic settings.

### 3.3. False Memories

As with the existence of recovered memories, there was little disagreement over the existence of false memories. The focus of discussion here was also on the mechanisms involved in the creation of false memories and how the findings can be applied to a variety of clinical settings. In essence, the existing research (Bruck, this volume; Hyman, Husband, & Billings, 1995; Hyman and Pentland, 1996; Lindsay, this volume; Loftus & Pickrell, 1995) has indicated that in repeated interviews, with misleading information and some social pressures, some people can create memories of events that did not happen. What needs to be defined is the exact roles that the different pressures play in the creation of false memories. In addition, although researchers have found that a variety of false memories can be created, there likely are some limits in the nature of false events that people can be led to believe occurred. Is it possible that people can create memories of traumatic experiences? Must events be related to personal experiences in order for false events to be created? Group B felt that several other factors related to memory construction should also be explored, including: beliefs concerning memories, social pressures, group processes, emotion, and individual differences.

Group B also felt that future research should explore how people can be asked about the past in non-leading fashions. This issue is particularly important in interviewing children. Future research should investigate further the cognitive interview (and other techniques) and its application to interviewing child witnesses and adults remembering their childhood. How leading is too leading is a question that repeatedly surfaced in a variety of conversations at the NATO conference. In addition, future research should continue efforts to discriminate true from false memories.

Research on memory errors should take a variety of approaches. It can involve careful lab studies of small memory errors in which it is possible to manipulate variables and note their effects. It can also involve naturalistic studies that investigate the application of existing knowledge to the creation of full memories in a variety of contexts. In addition, case studies of recantors, people who claim that memories they previously claimed as recovered are actually false, would be valuable.

#### 4. CONCLUSION

There are several important conclusions to be drawn from the conversations that occurred in the work groups. Group A's discussions illustrated the need for systematic cognitive analyses of the specific assumptions and mechanisms underlying various clinical constructs. Group B's discussion revealed the plethora of research directions that will be necessary for understanding veridical and non-veridical memories of trauma. Finally, both discussions highlighted the value of conversation and collaboration among the various types of researchers interested in memory for trauma. The independent approaches so often taken by researchers studying these issues has reached the point where we no longer speak the same language or even agree on the basic questions. To counter this alarming trend, we must open avenues of intellectual exchange between cognitive, clinical and neurocognitive psychologists (among others) so that we can overcome, without overlooking, differences as we systematically disentangle the complex issues in which the field is currently ensnared. We hope that one outcome of the NATO ASI generally, and the work groups in particular, is the beginning of such cooperative exchanges.

#### REFERENCES

- Anderson, R.C., & Pitcher, J.W. (1978). Recall of previously unrecalled information following a shift in perspective. *Journal of Verbal Learning and Verbal Behavior*, 17, 1-12.
- Anderson, M.C., Bjork, R.A., & Bjork, E.L. (1994). Remembering can cause forgetting: Retrieval dynamics in long-term memory. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 20(5), 1063-1087.
- Atkinson, R.C., Herrmann, D.J. & Westcourt, K.T. (1974) Search processes in recognition memory. In R.L. Solso (Ed.) *Theories in cognitive psychology: The Loyola Symposium* (pp. 101-146). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Atkinson, R. C., & Shiffrin, R. M. (1969). Human memory: A proposed system and its control processes. In K. Spence & J. Spence (Eds.), *The psychology of learning and motivation* ((Vol. 2). New York: Academic Press.
- Brown, R., & Kulik, J. (1977). Flashbulb memories. *Cognition*, 5, 73-99.
- Bjork, R.A. (1989). Retrieval inhibition as an adaptive mechanism in human memory. In H.L. Roediger, & F.I.M. Craik, (Eds.), *Varieties of memory and consciousness: Essays in honor of Endel Tulving*. (pp. 309-330). Hillsdale, N.J.: Erlbaum.
- Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behavior. *Psychological Review*, 66, 183-201.
- Ebbinghaus, H. (1913 (1885)). *Memory: A contribution to experimental psychology*. New York: Columbia Teacher's College.
- Eich, J.E. (1980) The cue dependent nature of state dependent retrieval *Memory and Cognition*, 8, 157-158.
- Erdelyi, M.H. & Kleinbard, J. (1978). Has Ebbinghaus decayed with time? The growth of recall (hypermnnesia) over days. *Journal of Experimental Psychology: Human Learning and Memory*, 4, 275-289.
- Freud, S. (1901/1974). Childhood memories and screen memories. In J. Strachey (Ed.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 6, pp. 43-52) London: Hogarth Press.
- Freud, S. (1915/1957). Repression. In J. Strachey (Ed.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 14, pp. 141-158). London, Hogarth Press.
- Hilgard, E.R. (1992) Dissociation and theories of hypnosis. In Fromm, E. & Nash, M.R. *Contemporary Hypnosis Research* N.Y., N.Y.: Guilford Press
- Horowitz, M. J., & Reidboard, S. P. (1992). Memory, emotion, and response to trauma. In S. Christianson (Ed.), *The Handbook of Emotion and Memory: Research and Theory* (pp. 343-357). Hillsdale, NJ: Erlbaum.
- Hyman, I. E., Jr., Husband, T. H., & Billings, J. F. (1995). False memories of childhood experiences. *Applied Cognitive Psychology*, 9, 181-197.
- Hyman, I. E., Jr., & Pentland, J. (1996). Guided imagery and the creation of false childhood memories. *Journal of Memory and Language*, 35, 101-117.

- Janet, P. (1889). L'automatisme continue. *Revue générale des sciences*, 4, 167-179.
- Jacoby, L.L., & Dallas, M. (1981). On the relationship between autobiographical memory and perceptual learning. *Journal of Experimental Psychology: General*, 3, 306-340.
- Jacoby, L.L., Kelley, C.M., & Dywan, J. Memory Attributions. In H.L. Roediger and F.I.M. Craik (Eds) *Varieties of memory and consciousness: Essays in honor of Endel Tulving*. (pp. 391-422) Hillsdale, N.J.: Erlbaum.
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, 114, 3-28.
- Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals*, 25, 720-725.
- Mandler, G. (1980). Recognizing: The judgment of a previous occurrence. *Psychological Review*, 87, 252-271.
- Neisser, U. (1982). *Memory observed: Remembering in natural context*. San Francisco: Freeman.
- Neisser, U. & Harsch, N. (1992). Phantom flashbulbs: False recollections of hearing the news about Challenger. In E. Winograd & U. Neisser (Eds.), *Affect and accuracy in recall: Studies of "flashbulb memories"* (pp. 9-31). Cambridge: Cambridge University Press.
- Nelson, K. (1993). The psychological and social origins of autobiographical memory. *Psychological Science*, 4, 1-8.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. New York: Oxford University Press.
- Roediger, H.L. (1990). Remembering reconsidered: Ecological and traditional approaches to the study of memory. *American Journal of Psychology*, 103(3), pp. 403-407.
- Roediger, H.L., Weldon, M.S., & Challis, B.H. (1989). Explaining dissociations between implicit and explicit measures of retention: A processing account. In Roediger, H.L., & Craik, F.I.M. (Eds) *Varieties of memory and consciousness: Essays in honor of Endel Tulving*. (pp. 1-41). Hillsdale, N.J.: Erlbaum.
- Schacter, D. (1987). Implicit Memory: History and current status. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 13(3), 510-518.
- Schacter, D., Chiu, C.Y.P., & Ochsner, K.N. (1993). Implicit memory: A selective review. *Annual Review of Neuroscience*, 16, 159-182.
- Singer, J.L. (1993). Experimental studies of ongoing conscious experience. In Bock, G.R & Marsh, J. (Eds) *Experimental and Theoretical Studies of Consciousness*. N.Y., N.Y.: John Wiley and Sons.
- Terr, L. C., Bloch, D. A., Michel, B. A., Shi, H., Reinhardt, J. A., & Metayer, S. (1996). Children's memories in the wake of Challenger. *American Journal of Psychiatry*, 153, 618-625.
- Tromp, S., Koss, M.P., Figueredo, A.J. & Tharan, M. (1995). Are rape memories different? A comparison of rape, other unpleasant, and pleasant memories among employed women. *Journal of Traumatic Stress*, 8, 607-628.
- Tulving, E., & Thompson, D. M. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review*, 80, 352-373.
- van der Kolk, B.A., & Fisler, R. (1995). Dissociation and the fragmentary nature of traumatic memories: Overview and exploratory study. *Journal of Traumatic Stress*, 8, 505-525.
- van der Kolk, B.A., & van der Hart, O. (1991). The intrusive past: The flexibility of memory and the engraving of trauma. *American Imago*, 48, 425-454.
- Wegner, D. (1994). Ironic processes of mental control. *Psychological Review*, 101, 34-52.
- Winograd, E. & Neisser, U. (1992). *Affect and accuracy in recall: Studies of "flashbulb memories"*. Cambridge: Cambridge University Press.