

Special Populations and Memory

Intellectual Disability

The pattern of results from the studies reviewed demonstrates that individuals with mental retardation can provide accurate accounts of witnessed events, particularly in a free recall situation that immediately follows the events. In this circumstance, the information they report is likely to be accurate though incomplete relative to age-matched comparisons (Kebbell & Hatton, 1999). As time passes and the questioning becomes more closed-ended, accuracy of memory reports tends to decrease (Milne, 1999). Particular concerns are tendencies to respond affirmatively when asked about events that did not occur and to change responses under repeated questioning (e.g., Clare & Gudjonsson, 1993; Henry & Gudjonsson, 1999). It is important when evaluating memory accuracy that level of mental retardation be considered. Research has consistently shown that individuals with mild mental retardation provide more complete and accurate descriptions than do individuals with moderate or severe mental retardation. As IQ decreases, so does accuracy of reporting details of past events. Future research should focus on (a) methods of questioning that elicit the most complete and accurate reports from individuals with mental retardation (see Dent, 1992), (b) a broader range of age groups and etiologies of mental retardation, and (c) issues concerning competency to understand the oath and testify in a court proceeding (e.g., Gudjonsson, Murphy, & Clare, 2000).

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Autism

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Schizophrenia

The research literature on schizophrenia and memory suggests that individuals with schizophrenia have impairments in memory, and that these impairments may particularly involve difficulty in encoding and source monitoring. The data suggest that individuals with schizophrenia rely more heavily on familiarity or gist when evaluating the accuracy of a memory because they do not remember item-specific details as well as individuals without schizophrenia. Despite this seeming overreliance on gist memory and poorer memory for source information, schizophrenia patients do not demonstrate significantly higher rates of false memories on many recognition tests. Identifying the bases of this counterintuitive finding should be a primary focus of research. This

result may be due to factors such as failure or diminished ability to use list organization (e.g., Brébion et al., 1997) or reduced semantic organization (e.g., Goldberg, Dodge, Aloia, Egan, & Weinberger, 2000). Further research on false memory in schizophrenia should use paradigms that more directly examine false memory, such as the DRM paradigm (e.g., Moritz et al., 2004). In addition, because the vast majority of the research in this area has been performed with words as stimuli, future research should use other types of stimuli. By researching the cognitive underpinnings of false memory in patients with schizophrenia, techniques may be developed to help these individuals monitor the source of their memories.

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Alzheimer's Disease (AD)

Taken together, these studies confirm that AD patients suffer serious memory deficits. In all studies, AD patients showed lower levels of veridical recall or recognition than did healthy adults. The pattern of findings for false reports is less clear. On tests of recall, false memories for critical items were similar for individuals with AD and the controls. However, on tests of recognition, individuals with AD tended to produce fewer false memories. This effect was qualified by several methodological changes, however. With repeated lists or use of pictures, false report rates of individuals with AD increased on tests of recognition memory. It appears that group differences may result from differences in the use of gist information. The individuals with AD may have degraded gist memory and therefore lower rates of false recognition, unless procedures that enhance gist memory (e.g., list repetition, pictorial stimuli) are used. These enhancements have the opposite effect for individuals without AD.

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Dissociation

The Diagnostic and Statistical Manual (DSM-IV-TR) describes dissociation as a disruption in the integration of consciousness, memory, identity, and perception (APA, 2000). There are individual differences in dissociation among healthy individuals, but higher levels are implicated in a variety of psychological disorders, ranging from the dissociative disorders to acute stress disorder, post-traumatic stress disorder (PTSD), and somatization disorder. A review of the literature on trauma and pathological dissociation is beyond the scope of this chapter (but see the chapter in this volume by Smith & Gleaves); hence, the focus of the studies discussed below will be on individual differences in dissociation in healthy individuals.

Dissociation is thought to comprise three factors: depersonalization/derealization, absorption or imaginative involvement, and dissociative amnesia (Bernstein & Putnam, 1986). One of the most commonly used inventories to measure dissociation is the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986; Carlson & Putnam, 1993), a 28-item self-report questionnaire in which individuals rate on a scale from 0% to 100% how often they experience certain events related to dissociation. The DES items measure dissociative symptoms via three major subscales that tap into the factors described above. In addition, a fourth subscale, the dissociative taxon (DES-T), is an eight-item subset of the DES that measures a pathological form of dissociation. Higher scores on this subscale are usually seen only in those with trauma or dissociative disorders (Eisen, Morgan, & Mickes, 2002).

Although healthy individuals dissociate to some extent with little effect on their daily lives (e.g., highway hypnosis, becoming absorbed in a task), higher levels of dissociation may disrupt memory processes and subsequent accuracy for an event's occurrence. The consequences of such interference may result in high dissociators having little to no memory for an event, or they may extract the gist of a situation and remember superficial material rather than specific detail. Reliance

on gist-based phenomena can be a precursor to false memory (see Reyna & Brainerd, 1995, and this volume, for a discussion of fuzzy trace theory). Dissociation and its effect on memory have been assessed with such laboratory tasks as the DRM paradigm, and for memory of autobiographical and historical events. Discussed below are several studies that have demonstrated how dissociation may have a negative impact on memory.

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Pathological levels of dissociation are commonly associated with deficits in cognitive processing (DSM-IV-TR, 2000). However, normal levels of dissociation in healthy individuals also may interfere with attention and memory. Examination of dissociation and memory in the laboratory suggests that people who report more dissociative behaviors on the DES are more susceptible to memory error (although see Kindt & van den Hout, 2001), possibly because their lack of attention to externally presented stimuli leaves them vulnerable to suggestion. Hence, they assimilate nonevents into an existing cognitive framework. Although everyday dissociation can be inconsequential, the above studies indicate that higher levels of normal dissociation may be associated with the incorporation of nonexistent childhood events into memory, memory distortion for historical events, and suggestibility to misleading questions. All of these errors have implications in a forensic setting.

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Trauma

Together, results from different research groups have indicated that the DRM paradigm can distinguish between groups of people who have experienced trauma from those who have not; those who have developed PTSD from the result of a trauma from those who have not; and people who believed they experienced an event that might be considered traumatic (i.e., being abducted by space aliens) from those who have not made such claims. Findings from this research do not suggest that traumatized individuals fabricate, or are more likely to fabricate, memories about events in their everyday lives, or about their specific traumatic event. Rather, they show that traumatized populations, especially those with PTSD, may be more prone to incorporate suggested information into their memories. Studying memory and false memory in traumatized populations may shed light on thought processes and memory biases associated with traumatization that extend beyond information provided in the environment. Readers are strongly cautioned that the paradigm's utility cannot generalize past the laboratory, and that these studies make no claims against the veracity of trauma victims' experiences. It may be that traumatic events did occur and they may have affected the cognitive processing of the above-mentioned trauma groups, hence making them susceptible to the false memory effect in the laboratory (Clancy et al., 2002).

Memory is reconstructive rather than reproductive in nature; thus we are limited in our ability to determine whether an event occurred, and if so, what the precise details of it were. The laboratory research discussed above indicates that both healthy individuals and trauma populations are susceptible to memory error. Studying false memory in a controlled laboratory setting provides an objective way of determining the cognitive and external components that may be responsible for false memory generation, thus allowing for the potential of laboratory research informing clinical practice and the legal system.

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Alcohol

The simulated eyewitness studies, together with our review of laboratory episodic tasks, lead to several conclusions. First, moderate quantities of alcohol are likely to reduce subsequent recall, particularly for information that was peripheral to the meaning of the event. With increased

dosages we would anticipate the effects to be dramatically worse. Second, the more sensitive implicit tests of memory suggest that alcohol does not affect all types of information equally, with sparing of information that is automatically encoded (possibly frequency and spatial information), and that with such tests memory or knowledge of other details may be revealed. Third, one consistent effect of alcohol that is important in court proceedings is the reduced recollective phenomenology associated with an event, a reduction that may make a witness appear less confident and less knowledgeable. Finally, it is likely that individuals who have consumed alcohol may be less resistant to the effects of suggestion and post-event information. If true, more precautions need to be taken during their interviews and interrogation.

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Marijuana

As with alcohol, marijuana intoxication appears to have its primary effects at the encoding and storage stages (Heishman, Arasteh, & Stitzer, 1997; Parkin, 1987; Wetzel, Janowsky, & Clopton, 1982). There is limited evidence that marijuana intoxication can produce severe memory deficits, but does so very rarely (Stracciari, Guarino, Crespi, & Pazzaglia, 1999). As with alcohol of course, sustained use of the substance may have cognitive deficits that, as yet, are both poorly documented and understood (Gunderson, Vosburg, & Hart, 2002). These effects are not particularly relevant to the question of interest here: Does marijuana intoxication impair memory for a single witnessed event?

Virtually no eyewitness testimony work has been done on the effects of marijuana. Only one study by Yuille et al. (1998) assessed the effects of marijuana on memory for a complex and staged event in which a purported experiment was disrupted by an angry confederate, followed by a heated interaction between researcher and confederate, and witnessed by a group of observers. The experimental group smoked a marijuana cigarette (with a moderate tetrahydrocannabinol (THC) content of 1.24%), and the placebo group smoked a highly similar cigarette with THC effectively at zero. Memory tasks included a full Step-Wise Interview procedure (Yuille, Hunter, Joffe, & Zaparniuk, 1993) and a photo identification task for the confederate. The participant's subjective ratings of the effects of marijuana demonstrated that the marijuana group did indeed feel intoxicated, but in a manner consistent with placebo effects in alcohol research, even the control condition gave intoxication ratings substantially beyond "no effect." The results on the memory tasks demonstrated impairment (21% fewer details recalled) at the immediate interview (while the marijuana participants were still intoxicated); however, this difference proved to be temporary because it was eliminated when all subjects were tested 1 week later. Control participants did not significantly improve their recall from the first to the second interview. There was no measurable effect of marijuana on the identification task. The authors argued that, given the equivalence of recall at the second interview, marijuana affected the retrieval of information on the immediate test, but not the storage of information. The retrieval deficit was hypothesized to result from reduced motivation among the marijuana group to report details. Overall then, consumed in moderation, marijuana exerts effects on memory that appear to be fairly small and temporary.

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