

# Adults' Memories of Long-past Events

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What do you know of your own past? We suspect that most persons asked this question would reply, "Why, everything!" Perhaps after a pause the person would go on to say "Well, everything *important*, at least!" Our knowledge of our own personal past seems to roll like a carpet, stretching continuously behind us from the present beneath our feet into the distance of childhood and on toward the vanishing point of infantile amnesia. People know that they quickly forget much of the minutia of daily life (e.g., what shoes did you wear to work last Wednesday?), and most people occasionally discover that their recollections of a past event differ from those of others who also experienced that event. But people nonetheless seem to have an intuitive sense that their autobiographical memories are *in all important respects* complete and accurate. Indeed, people who report very poor memory for substantial periods of their personal pasts may be diagnosed as suffering mental illness (C. A. Ross, 1989) or brain damage (Kopelman, 1997).

Related to this intuitive sense that autobiographical memory is essentially complete and accurate is the naive assumption that memories are somewhat like videotapes, with each experience stored on its own cassette and housed in a vast autobiographical library. From this perspective, although it is sometimes difficult to locate a tape, and details may become blurred with the passage of time, the stored essence of each experience is in principle available for playback. (For a discussion of metaphors of memory, see Roediger, 1980.)

During the last quarter of a century many memory researchers have published findings and arguments that challenge this naive view of autobiographical memory as a storehouse, and of autobiographical remembering as playback (e.g., Schacter, 1999). It is now well established that memory is not a simple storehouse of unitized records of past experience, and that remembering is not merely a matter of locating and playing back such records. Researchers have shown that recollections (including autobiographical reminiscences) are influenced by the rememberers' beliefs and desires (e.g., Conway & Pleydell-Pearce, 2000; Jacoby, Kelley, & Dywan, 1989; Johnson, Hashtroudi, & Lindsay, 1993; M. Ross, 1989; Whittlesea, 2003).

Despite this emphasis on the reconstructive nature of memory, we believe that many memory theorists still overestimate the completeness of autobiographical memory and underestimate human susceptibility to reconstructive memory errors regarding long-past autobiographical events. In this chapter we describe some of the findings that have led us to suspect that most people have forgotten (in the sense of not being able volitionally to recall, given verbal cues) much of their own personal histories.<sup>1</sup> Some of the work we summarize also explores the relationship between memory phenomenology for long-past events and the emotion associated with those events. We also consider the implications of autobiographical forgetting for susceptibility to suggestive influences that can lead people to experience pseudomemories (that is, illusions of remembering an event that did not really occur in the person's past).

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We do not assume that episodic memory information disappears from the brain (i.e., becomes non-available). It is possible, given sufficiently distinctive cues, to recover memories of long-forgotten events that had initially been encoded in ways that support long-term retention. Thus our claim is that individuals do not have access to effective cues for memories of vast portions of their past experiences.

## Diary Studies

In the late 1990s, we conducted two studies (with Jonathan Schooler and Ira Hyman) of memory for long-past events recorded in personal diaries. Participants in these studies were recruited via newspaper advertisements seeking individuals who had kept a personal diary years in the past. In an initial screening interview, we identified a target year for each individual, selecting the oldest year unless participants indicated they had reviewed entries from that year, in which case we selected the oldest non-reviewed year.

In the first of these diary studies, the participants were 19 residents of Bangor, Wales, United Kingdom, who ranged in age from 27 to 77 years ( $M = 50$  years). The target year of the diary ranged from 7 to 60 years previous to the date the study was conducted ( $M = 28$  years). The second diary study involved 17 participants from Victoria, British Columbia, Canada, ranging in age from 24 to 58 years ( $M = 44$  years), with target diaries ranging from 8 to 39 years old ( $M = 19$  years). In each study, all but two participants were women.

In both studies, participants were asked to read eight entries from the target year of their diary (beginning with the first large entry in the year, then casually flipping forward a month or two to another large entry). For each entry, they were asked to complete a questionnaire that asked about three sorts of subjective experiences that might or might not arise when reading the entry: "Ordinary-memory experiences," in which reading the entry reminds the person of an event that they feel they have always known about and remembered (although they might not have thought of it in years); "No-memory experiences," in which there is a surprising failure to recognize a seemingly memorable event described in the diary; and "recovered-memory experiences," in which there is a surprising feeling of recovering long-forgotten memories. Here we will summarize responses regarding the latter two sorts of memory experiences (recovered-memory and no-memory experiences).

Recovered-memory experiences. In each study, 16 participants (84% and 94% in Studies 1 and 2, respectively) reported one or more recovered-memory experiences (RMEs), with means of 2.5 (Study 1) and 3.2 (Study 2) of the 8 diary entries being described by participants as giving rise to an RME. Many of these appeared to us to be events that it would not be particularly surprising to have forgotten about and then remembered when reading the diary (e.g., "Traveling to Berlin and meeting my uncle for the first time;" "At night off X Islands, sides of ship lit up brightly as ship moved through water, caused by phosphorous plankton in the sea;" "Xmas—first one in New York: Had totally forgotten that all the kids were there;" "...a colleague who I had forgotten about").<sup>2</sup> Some of the reported RMEs, however, were more dramatic. One respondent, for example, reported that she had long forgotten a serious romantic relationship that she recalled when re-reading her diary:

Jeff gave me a spray of cream rosebuds to wear. We were very emotional as we danced the last waltz. I knew I had to make a choice—Jeff or a career—and I was only 17 years old. I chose a career . . . I had put Jeff out of my mind.

Two participants reported recovering memories about their parents being injured in car crashes. Two others described RMEs involving family fights ("My oldest brother lost his temper with his wife . . . Threw his dinner at the wall" and "A fight between my sister and stepfather that involved verbal and physical abuse . . . I started picturing the event in my mind only after reading the entry several times . . . I called my sister and she didn't remember it at all"). Another participant wrote about being

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Surface details of participants' reports were altered to protect their anonymity.

surprised to recover memories of holding very strong anti-abortion views to which she no longer subscribed (and had forgotten she had ever held until she reread the diary entry). The relatively “dramatic” recovered memories cited here tended to be emotionally negative (perhaps in part because strong negative emotion contributes to their drama), but overall the self-reported RMEs ranged fairly evenly from negative to neutral to positive.

The diary study findings regarding RMEs converge with results reported by Read (1997), who asked 413 Canadian adults, “Have you ever recalled an experience or series of related experiences that you had ‘forgotten’ about for some extended period of time?” More than half (60.3%) indicated that they had experienced such memory-recovery experiences. A substantial minority of these reports concerned traumatic events such as sexual abuse (7.3%) or other trauma (20.6%), but most involved more mundane or positive events. Interestingly, some respondents in Read’s study indicated that they had forgotten and then recovered memories of long-term, oft-repeated experiences. Here again, in some cases these RMEs for repeated events involved traumatic experiences such as sexual abuse, but in others they did not (e.g., one respondent reported having forgotten for years, and then recovering memories of, taking piano lessons for several years as a child).

It is probably not unusual for individuals to recover memories of long-forgotten experiences when they encounter appropriate cues. Of course, it is one thing to recover memories of piano lessons, and quite another to recover memories of being sexually molested by a parent. In the former case, the individual might think “That’s funny, I’d completely forgotten about those lessons,” whereas in the latter the person’s beliefs about fundamental parts of his or her personal history would be shattered. Despite this dramatic difference in the implications and emotional impact of RMEs of positive or neutral events versus RMEs of traumatic events, we suspect that the basic mechanisms underlying the memory recovery phenomenon itself is essentially the same (excepting cases in which RME reports emerge through a prolonged and suggestive effort to recover memories, which we believe can give rise to false memories).

No-memory Experiences. Typically, before a person can experience a RME he or she must first have forgotten a memorable autobiographical event.<sup>3</sup> As mentioned at the outset of this chapter, intuition suggests that people rarely forget the important, dramatic, consequential events of their lives. It is in regard to this issue that the diary study results strike us as particularly interesting. Across the two studies, 29 of the 36 participants (80%) reported one or more “no-memory experiences” (i.e., self-reported a surprising lack of memories for a seemingly memorable event), with a mean of 2.4 of the 8 diary entries being said to give rise to such reports. Here are some examples:

“Teaching my sister to ride a bike.”

“The people and everything I did this day doesn’t mean anything to me.”

“It says ‘Mike likes me,’ but I wonder who on earth Mike was.”

“It was my 17<sup>th</sup> birthday . . . The mother of my dead girlfriend phoned me. It was an emotional

Schooler and co-workers (Schooler, 2001; Schooler, Ambadar, & Bendiksen, 1997) reported two case studies of women who had full-blown RMEs of childhood sexual abuse but who had told confidants about the abuse during the period of supposed amnesia; they had forgotten that they had previously remembered the abuse. For laboratory analogs of this phenomenon (which Schooler termed the “forgot it all along” effect), see Arnold and Lindsay (2002, in press); Joslyn, Loftus, McNoughton, and Powers (2001); and Padilla-Walker and Poole (2002).

time for me and I can't believe I can't remember it."

"I mention studying painting and singing at the boarding school I'm attending for 12<sup>th</sup> grade, yet this surprises me because I have no memory of it."

"Have recorded that I heard my dad threaten to hit my mother."

"I made efforts to be 'Fred's' dance partner. I had a crush on him and chased after him. But now I have no idea who this guy is, much less did I have a crush on him."

"I had totally forgotten some of the things that went on at my sister's wedding . . . I wrote that I cried when a song was played at the dance, then walked off to a nearby field and cried."

"I was 14 when I wrote these entries . . . I was a monarchist. I'm not now, and it's embarrassing. I thought I never was."

"I can't believe I suffered from and apparently was treated for depression—at that age! If I had been asked whether I have ever been depressed, I would have said NO."

Here again, although some of the no-memory reports involved negative events, others involved positive or neutral events. Also, although the examples given above are at least somewhat dramatic and surprising (i.e., one might be surprised that a person who experienced the event would not remember it), other events for which participants claimed a "surprising" lack of memories do not seem to us to warrant such surprise. In any case, the point for current purposes is that participants frequently reported that they were surprised by their lack of memories of events described in their own diaries.

After completing the questionnaires for the eight diary events, participants were invited to make general comments about the experience of re-reading their old diary entries. Many participants did volunteer such comments, and most of them shared a common theme. That theme is readily apparent in the following examples (each of which comes from a different participant):

"I was surprised at not remembering some of the entries . . . Reading something that you have done and now do not remember is quite unnerving."

"Found it odd, the things I had totally forgotten."

"I was surprised at how many experiences I had no recollection of at all."

"I was actually surprised, and a little concerned, about my lack of ability to recall events and, more importantly, people."

"I was amazed by the number of people mentioned who I cannot remember now . . . I thought I had a good memory—I've changed my mind."

"I could have been reading someone else's diary."

"I feel as if I'm reading something that someone else wrote."

As these examples illustrate, many of the participants spontaneously expressed surprise (and, in some cases, dismay) at how many of the events described in their diary seemed utterly unfamiliar, as though they had happened to someone else. Similarly, Loftus, Garry, and Feldman (1994) cited evidence that people sometimes appear to have forgotten dramatic adulthood events, such as serious motor vehicle accidents, hospitalizations, and crime victimizations. The implication, of course, is that you too have likely forgotten substantial portions of your own personal history, including events that you would be surprised to learn ever happened to you.

The findings of these diary studies are related to fascinating research by Winkielman, Schwarz, and coauthors (Belli, Winkielman, Read, Schwarz, & Lynn, 1998; Winkielman & Schwarz, 2001;

Winkielman, Schwarz, & Belli, 1998; see also Merckelbach, Wiers, Horselenberg, & Wessel, 2001). Their core finding is that asking young adults to recall more than just a few childhood memories leads participants to downgrade their estimates of the completeness and accessibility of their memories for childhood. That finding suggests that people typically assume it will be easy for them to recall multiple childhood experiences. Likewise, the diary study results demonstrate that people are surprised at the number and kinds of events described in their own diaries that they fail even to recognize as familiar.

Other memory researchers have reported a variety of different sorts of diary studies of autobiographical knowledge. For example, several researchers have kept structured records of events in their own lives and then tested their ability to remember those events (e.g., Conway, Collins, Gathercole, & Anderson, 1996; Linton, 1982; Wagenaar, 1986). Others have asked undergraduate participants to complete daily records of life events for periods of weeks or months and then tested them on those record (e.g., Bower, 1981; Rubin, 1982; Thompson, Skowronski, Larsen, & Betz, 1996; Thomson, 1930). Our procedure, in which participants are ordinary people who, for reasons of their own, had kept diaries in the distant past, is similar to Burt's (1992; Burt, Kemp, & Conway, 2001) (see also Smith, 1952). The method is weak in terms of control, but it could potentially be improved in this regard. For example, we had little control over which entries subjects read, but Burt obtained subjects' diaries before they re-read them and selected the events on which participants were tested (although, given our evidence that participants are likely to have forgotten much of what is in the diaries, it is not clear that subjects can give informed consent for researchers to read their diaries). In any case, the paucity of control is offset by the advantages of testing memory for spontaneously recorded real-life experiences with very long delays (up to 58 years in our studies) and of being relatively easy to conduct.

#### Childhood Memories Questionnaire Studies

Lindsay, Wade, Hunter, and Read (2004) reported questionnaire studies in which adult respondents were asked about a number (28 to 32, depending on the study) of events that they might or might not have experienced during childhood. In Study 1 ( $N = 96$ ) and in a replication of Study 1 with another 92 participants (not reported in detail in our article), respondents were undergraduates at a university in the midwestern US, whereas Study 2 ( $N = 93$ ) tested a community sample of residence of Victoria, British Columbia, Canada, who ranged in age from 21 to 93 years. The questionnaire asked about childhood events ranging in base rate from events that most respondents would have experienced during childhood (such as playing in a sand box) to events that relatively few would likely have experienced (such as having surgery), and in emotional quality from events that most people would view as negative (such as being bitten by a dog) to events that most would view as positive (such as playing with finger paints). For each event listed on the questionnaire, participants were asked to indicate whether they had experienced that event during childhood and, if so, if they remembered the experience (that is, recollected details of it) or merely knew it had happened. Respondents also rated the emotion of each event (on a 5-point scale, from very negative to very positive).

False memories. The reconstructive nature of autobiographical remembering may be revealed by asking people to remember plausible events they never experienced. One event on the questionnaire was selected because few if any of the respondents would have experienced that event: "As a young child, did you ever see a cigarette ad on TV?" Because US and Canadian television stopped advertising cigarettes in 1971, few if any of our respondents 27 years of age or younger would have seen such advertisements. Nonetheless, more than half of the respondents who were born after TV in Canada and the US stopped airing such ads indicated that they had seen such ads during childhood. It is possible that some respondents had seen cigarette ads on television during childhood trips to other countries, but this was almost certainly the exception rather than the

rule. Not only did many participants indicate they had seen such ads during childhood, but approximately a third of the respondents also claimed that they had memories of seeing those ads. In Study 2, which included a wide age range, respondents born after cigarette ads were banned from TV were just as likely as older respondents to claim to have seen and to remember seeing such ads.

Why did respondents so often falsely claim to have seen cigarette ads on TV, and to remembering seeing those ads? We speculate that having seen other sorts of television ads, print ads for cigarettes in magazines and on billboards, and movies and TV shows in which characters are shown smoking cigarettes lays fertile ground for the creation of false memories of having seen cigarette ads on TV. Asked if they had seen cigarette ads on television during childhood, these prior experiences would be a source of thoughts and images coming to mind that respondents might misattribute to memories of TV ads.

Positivity bias in reports of experience. Most of the events listed on the questionnaires were of events respondents might well have experienced during childhood. One measure of interest was whether or not participants said they had experienced particular events. Responses of “No, I never experienced that event during childhood” seemed suspiciously high for some events. For example, more than a third of respondents indicated that they had never “peed their pants in public” during childhood, but it seems likely that most children experience such accidents early in toilet training (including after the age of two or three years—that is, beyond the offset of infantile amnesia). As per the results of the diary studies described above, it is tempting to speculate that some responses of “No, never experienced” reflected forgetting of events that actually had been experienced.

We also examined the relationship between whether or not respondents indicated they had experienced events and the emotional affect associated with those events. For each event, respondents provided an emotion rating on a 5-point scale ranging from “very negative” to “very positive.” Ratings were to indicate emotion during the experience itself; for reportedly non-experienced events ratings were to indicate the emotion the respondent believes s/he would have had if the event had been experienced. Previous explorations of such relationships have been difficult to interpret because of potential confounding differences between events rated as negative versus neutral versus positive. For example, it could be that the negative events tested in a particular study were rarer, or occurred earlier in childhood, or were in some other way less memorable than the positive events. To reduce these interpretive problems, we analyzed our data with random-effects regression models (deLeeuw & Kreft, 1986). These statistical analyses treated event (i.e., “ride a pony or horse, ” etc.) as a fixed within-subjects effect, and assessed event-varying predictors (such as reportedly experienced vs. non-experienced or remembered vs. non-remembered) as random within-subject effects. This enabled us to evaluate the relationship between the event-varying predictors (in this case, rated emotion) and the dependent variables of interest (in this case, whether the event was or was not reportedly experienced during childhood) while controlling for overall mean event effects (i.e., potentially confounding characteristics of particular events). Thus we could be confident that a statistically reliable relationship between rated emotion and memory reports could not be an artifact of confounding differences between inherently negative versus inherently positive events, because the random-effect regression model statistically controlled for event.

A random-effects regression analysis revealed that there was a substantial relationship between whether or not participants reported they had experienced an event and their rating of the emotion of that event. Reportedly experienced events tended to be rated as positive, whereas reportedly non-experienced events tended to be rated as negative. This finding is consistent with prior evidence of a “positivity” bias in autobiographical recall (e.g., Bahrck, 1998; Ruben & Berntsen, 2003; Thomson, 1930; Walker, Skowronski, & Thompson, 2003). Importantly, our analyses statistically controlled for event, so this relationship cannot be an artifact of confounding differences between

commonly experienced versus rarely experienced events.

Why were reportedly experienced events rated as more positive than non-experienced events? One possible explanation has to do with the fact that some of the events asked about on our questionnaires were things that our respondents chose to do or not to do when they were children (e.g., playing with finger paints, riding a pony or horse). Presumably, people would more often choose to do something if they liked it, and would choose not to do things they didn't like, which would lead to more positive ratings for experienced than non-experienced events. This cannot be the sole explanation for the effect, however, because the tendency to rate reportedly experienced events as more positive than reportedly non-experienced events was also observed for events that people do not choose to do but that simply happen to them. For example, for each of the following events people who reported that they had experienced the event gave more positive (or less negative) emotion ratings for that events than did people who reported they had not experienced it: have your tonsils removed; got checked for head lice; became lost alone and scared; laughed when drinking so that the drink came out your nose; broke a bone in your body.

It could be that people have a bias to assume that childhood events are less positive than they really are; hence, they give non-experienced events less positive ratings than experienced events. It could also be that people tend to remember past experiences as being more positive than they really were (Pollyannaism) (e.g., Walker et al. [2003] argued that the positivity bias in autobiographical remembering is partly due to a tendency for the intensity of remembered affect to fade with time more quickly for negative than positive events). Regardless of whether the effect reflected a tendency to underestimate the positivity of non-experienced events or to exaggerate the positivity of experienced events (or both), it would lead people to tend to view the events they believe they had experienced during childhood as more positive than the events they believe they never experienced.

It's likely that multiple mechanisms contribute to the tendency for people to rate events they think they experienced as children more positively than events they think they did not experience. It would be interesting to conduct follow-up research to see if this bias is related to individual differences on various personality measures (e.g., are depressed people less likely to rate reportedly experienced events more positively than reportedly non-experienced events?) (cf. Christensen, Wood, & Barrett, 2003).

Emotion and memory phenomenology. Inspired by work by Tulving (1985) and Gardiner and co-authors (e.g., Gardiner & Java, 1991), many memory theorists have become interested in the subjective phenomenology of recognition memory. In particular, researchers have distinguished between recognition that is accompanied by a subjective feeling of recollecting specific details of a prior encounter with a recognized item ("Remembering") versus recognition that is not accompanied by such episodic recollections ("Knowing"). Most research in this area has examined recognition memory for words or pictures. For example, subjects might study a list of words and later be shown test words one at a time and asked to indicate, for each word, whether they recognized it from the study list and, if so, whether they recollected encountering that word on the study list (e.g., could remember something about what they perceived, thought, or felt when the word was presented) or merely have a feeling of knowing that the word was on the study list.

A central aim of our questionnaire studies was to examine the phenomenology of memories of childhood experiences (cf. Byrne, Hyman, & Scott, 2001; Bruce, Dolan, & Phillips-Grant, 2000; D'Argembeau, Comblain, & Van der Linden, 2003; Hyman, Gilstrap, Decker, & Wilkinson, 1998; Rubin, Schrauf, & Greenberg, 2003). Respondents often reported that they had experienced an event during childhood but had no recollections of the experience itself (i.e., that they merely "knew" they had experienced the event). That finding is not surprising for some of the events asked about on the questionnaire. For example, respondents often indicated that they had their fingernails cut by their

parents but that they had no recollections of experiencing this event. This is unsurprising because respondents could reasonably infer that their parents had probably cut their fingernails for them during early childhood. Similarly, Chambliss (1996) found that only 12% of a sample of 340 college students reported that they could recall sitting on a parent's lap when they were under 5 years of age; doubtless virtually all knew that they had done so on innumerable occasions, but few reported specific recollections of even a single such occasion.

Reports of knowing without remembering are more interesting in other cases. For example, across studies 147 of the 281 respondents indicated that they had been bitten by a dog during childhood, and of these 22 (15%) indicated that they had no memories of the incident. Being bitten by a dog during childhood is not culturally normative in the US and Canada, so (unlike the fingernail-cutting event) respondents probably did not simply infer that they must have experienced that event. Being bitten by a dog is also likely to be a unique event, as well as a quite salient and emotional experience (arguably even a traumatic one). In some cases, an adult might know that she or he experienced a particular dramatic event because of having heard parents or other family members talk about that event. It is also possible, however, that a feeling of knowing that one has experienced a particular event without remembering that experience could arise more spontaneously; that is, that such a feeling of knowing might not be based on second-hand knowledge but rather on the same sorts of memory influences that give rise to a feeling of knowing in list-learning experiments (for theoretical accounts of the remember/know distinction, see, e.g., Bodner & Lindsay, 2003; Donaldson, MacKenzie, & Underhill, 1996; Gardiner, Ramponi, & Richardson-Klavehn, 2002).

It is especially interesting that, among reportedly experienced events, those rated as emotional were more often recollected (as opposed to merely "known") than those rated as neutral. This result converges with Hyman, Gilstrap, et al.'s (1998) finding that, when participants were asked to generate one remembered childhood event and one known childhood event, the former was rated as more emotional. It is also consistent with laboratory research indicating that emotional materials are better remembered than neutral ones (e.g., Bower, 1992; Reisberg & Heuer, 1995). Our finding is novel, however, in that the effect was reliable even when statistically controlling for event (and, in Study 2, when also statistically controlling for reported age of oldest occurrence and reported number of times experienced).

Perhaps the most exciting of the findings in our questionnaire studies is that reportedly experienced events rated as positive were more often said to be remembered (as opposed to merely known) than those rated as negative. This relationship was not merely an artifact of confounding differences between inherently negative versus positive events on our questionnaires, because this pattern was observed even with event and (in Studies 2 and 3) reported age of oldest occurrence and reported number of times experienced statistically controlled. This finding might reflect enhanced recollection of positive events (e.g., due to greater rehearsal of such events) and/or impaired recollection of negative events (e.g., due to poorer encoding of negative events or the operation of an inhibitory "repression" mechanism such as avoidance of relevant cues [e.g., Anderson, 2003; Basden, Basden, & Morales, 2003; Sahakyan & Kelley, 2002]). Via either or both of these sorts of mechanisms, our results join other evidence of positivity bias in echoing an old popular song: "It's the good times we will remember." Events viewed as negative were less often said to have been experienced and, among reportedly experienced events, less often said to be remembered.

### Adults' Memories of High School

One limitation of the questionnaire studies described above (and of many prior studies of very long-term autobiographical memory) is that we have no way of knowing whether a respondent had or had not experienced a particular event in childhood. Even in the diary studies, we cannot know for sure that events described in a participant's diary had actually occurred as recorded. As a means of

addressing this issue, we conducted a study testing adults' memories for events that had happened during their senior year of high school (for other studies of memory for school, see, e.g., Bahrick, Bahrick, & Wittlinger, 1974; Walls, Sperling, & Weber, 2001). We recruited individuals who had graduated from a particular high school in Victoria, British Columbia, Canada, and used that high school's archival materials (e.g., old school newspapers, the class year book, the program for the commencement ceremony) to construct customized memory tests for each participant's year of graduation.

Our 42 participants had all graduated from the same high school 10 to 38 years before participating in the study. These people were probably not a representative sample of high-school graduates. For one thing, the high school from which they graduated is a relatively old and prestigious school in a relatively affluent neighborhood. For another, we recruited participants with newspaper ads soliciting graduates of this high school, and those who responded to the ad and went to the trouble of completing the study (which involved two in-person interviews with an intervening homework exercise) were probably unusually enthusiastic alumni.

Despite these likely subject-selection factors, which may have yielded a sample of individuals with particularly good memory for their high-school years, the most striking aspect of our results is how poorly participants did on most of the tests of memory for specific senior-year events. For example, participants were asked about specific events recorded in the school newspaper, yearbook, or other archival material, with questions such as "What musical play was put on in your senior year?" and "For which sport did the school team win a provincial trophy in your senior year?" Only about a quarter to a third of these questions were answered correctly. We also asked various questions about respondents' graduation (commencement) ceremony. Accuracy was perfect on a question about the location of the ceremony (the school's gymnasium), but only 11% of participants correctly remembered the time of day at which the ceremony was held, and only 53% remembered the name of their class valedictorian. We also showed participants four photos from their high-school yearbook mixed with three photos from another school's year book from approximately the same year: Participants indicated no familiarity for nearly half (46%) of the photos from their yearbook. In general, participants performed well on questions for which the correct answer conformed closely to a "script" of what a Canadian would expect to have happened, but performed poorly on other questions.

Each participant was tested twice, with a delay of one to a few weeks between the two interviews. On average, performance improved between the first and second sessions. For example, during the first interview only 36% of participants correctly remembered the name of a piece of music played during their commencement ceremony, but by the second interview 64% did so. Although performance improved across interviews for some questions, the opposite occurred for some other questions: For example, 75% of participants initially reported the date of the graduation ceremony correctly, but in the second interview only 36% did so.

Individual participants were surprisingly inconsistent in their responses. For example, it was not unusual for a subject to report in the first session that he or she had belonged to a particular high-school club (e.g., the chess club), but not to report having been in the club during the second session (or vice versa). Similarly, participants demonstrated both losses and gains (in about equal proportions) in their responses to specific-event questions. That is, quite often a question that was not answered or was answered incorrectly in Session 1 was answered correctly in Session 2, and approximately as often a question that was answered correctly in Session 1 was answered incorrectly (or not at all) in Session 2.

During both interview sessions, participants were asked to spend 10 minutes recalling names of classmates, teachers, and other school-related individuals, with the aim of recalling as many names as they could. There was tremendous variability across participants in the number of names recalled,

and we will not discuss those findings here, but will instead highlight an interesting effect of the name-recall task on participants' ratings of their memories. Participants were asked to estimate the percentage of people they had known in high school whose names they could remember if they spent time working at doing so. In both the first and second interviews, half of the participants were asked to make this estimation before working on the name-recall task, whereas others were asked this question only after they had worked on the name recall task. Two interesting effects emerged. In the first interview, participants who made the estimate before working on the name-recall task predicted that they would be able to remember 50% of the names, whereas those who made the estimate after working on the name-recall task for 10 minutes estimated that they would be able to remember only 33%. In the second session, predicted percentage recallable declined for both groups (to 36% among those who gave the estimate before repeating the name recall task, and to 26% among those who repeated the name recall task before giving the estimate). Like the diary studies described above (and the work by Winkielman, Schwarz, and co-authors cited earlier), these findings suggest that people expect their autobiographical memories to be more complete than they are.

### Childhood Photographs and False Memories

The controversy regarding reported recovered memories of childhood sexual abuse (e.g., Porter, Campbell, Birt, & Woodworth, 2003; Read & Lindsay, 1997) motivated several memory researchers to conduct studies designed to test the hypothesis the suggestive influences can lead adults to report illusory memories of non-experienced childhood events. Prior research had demonstrated that suggestive influences can lead substantial percentages of subjects to report false memories of peripheral details in pallid laboratory events (e.g., slide shows or videos; e.g., Loftus, Miller, & Burns, 1978), but this new research aimed to test the generalizability of those effects to false memories of autobiographical events comparable in some (albeit not all) respects to instances of childhood sexual abuse. Of course, researchers are bound by ethical principles that prohibit suggestions regarding childhood sexual abuse, so such studies used less traumatic events such as being lost in a shopping mall, spilling punch at a wedding reception, or breaking a window. It is possible that laboratory procedures that lead to false memories of such events would not produce false memories of incestuous abuse (see Pezdek, 2001), but given such effects the onus is on those who wish to argue against generalization.<sup>4</sup>

The dominant method in such studies was first introduced by Loftus (e.g., Loftus & Pickrell, 1995) and subsequently used with various modifications by researchers such as Ira Hyman (e.g., Hyman, Husband, & Billings, 1995) and Steve Porter (e.g., Porter, Yuille, & Lehman, 1999). Participants are led to believe that their parents or a sibling reported the childhood events that participants are asked to remember. Participants listen to a brief narrative description of each event, and then work at

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As noted in Lindsay and Briere (1997), two aspects of generalizability should be differentiated. One has to do with whether or not qualitatively different mechanisms underlie memories (and false memories) of traumatic versus mundane events, such that variables that affect trauma memories one might not affect (or have qualitatively different effects on) mundane memories. The other aspect of generalizability has to do with whether or not memory for traumatic versus mundane events is affected to the same degree by particular variables. It is clear that the absolute size of effects differs for memories of salient experiences versus trivial events. For example, a single passing suggestion is sufficient to lead a large proportion of people falsely to report remembering a trivial detail in a slide show, but much stronger suggestive influences are typically required to produce pseudomemories of dramatic life events. Likewise, we suspect that stronger suggestive influences are required to produce a given prevalence of false memories of childhood sexual abuse than of, say, a childhood prank. Nonetheless, we believe the same basic mechanisms can give rise to false memories of a wide range of kinds of pseudoevents.

remembering more about it (typically over two or three sessions). Most of the events participants are asked about really were reported by a parent or sibling informant, but the critical event is one that the informant reported the participant had NOT experienced. Across eight studies using this sort of procedure published in refereed journals, 116 of 374 participants (31%) were judged to have partial or complete false memories of the suggested event.

Wade, Garry, Read, and Lindsay (2002) used a novel procedure to foment false memories of a childhood pseudoevent. In their study, rather than reading narrative descriptions of actual and false childhood events, participants were shown photographs of actual childhood events (obtained from a sibling or other relative) and a doctored photograph of an event that (according to the informant) the participant had not experienced during childhood (namely, taking a ride in a hot air balloon). The false photographs were produced by using Photoshop to insert a digitized copy of an actual photographic image of the participant during childhood into a photograph of a hot air balloon. In two in-person interviews and an intervening telephone interview, participants attempted to remember the events depicted in the photographs. Of the 20 participants, 10 (50%) reported memories of the balloon-ride event by the end of the second in-person interview.

The 50% false-memory rate in the Wade et al. (2002) study is unusually high. The false-photograph procedure thus provides a useful method for producing false-memory reports for research purposes. The real-world implications of the findings are somewhat limited, however, because people rarely encounter doctored photographs of themselves doing things that they have not really done. (If people did encounter doctored photos of themselves frequently, the effect of such photographs on false memories would likely be somewhat attenuated because people would be less inclined to assume that photographs never lie.)

Although people rarely encounter doctored photographs depicting themselves in childhood pseudoevents, they do sometimes look at family photo albums containing pictures of themselves during childhood. Some popular self-help books and some professional publications in the trauma-memory-oriented literature (e.g., Weiser, 1990) have recommended that people who do not remember childhood sexual abuse but suffer any of a wide variety of symptoms should work at recovering potentially repressed memories of such abuse, and one recommended technique for doing so is to review family photograph albums. In surveys of qualified therapists, Poole, Lindsay, Memon, and Bull (1995) found that 38% of respondents reported use of family photo albums as a way of helping clients remember childhood sexual abuse. The idea is that such photographs provide rich cues that may trigger memories of long-forgotten abuse.

Childhood photographs probably *are* powerful cues for childhood memories. Although we have been unable to find any published experiments specifically testing the power of childhood photographs versus narratives as autobiographical memory cues, we know that recognition memory for naturalistic photographs tends to be extremely good, and it is reasonable to assume on theoretical grounds that photographs are peculiarly potent recall cues because of their high degree of distinctiveness. Unfortunately, from the perspective of the source-monitoring framework (e.g., Johnson, Hashtroudi, & Lindsay, 1993; cf. Jacoby, Kelley, & Dywan, 1989), it is also likely that childhood photographs, combined with suggestions to the effect that a person has a non-remembered history of incestuous abuse, could contribute to the formation of false memories (see Schacter, Koutstaal, Johnson, & Gross, 1997). Images derived from a photograph and from essentially veridical recollections cued by the photograph could combine with products of imagination driven by suggestions to produce vivid and perceptually detailed illusory memories.

In a study with Lisa Hagen, Kimberley Wade, and Maryanne Garry (2004), we tested the hypothesis that the effect of misleading suggestions regarding a childhood pseudoevent can be

increased by exposure to a true photograph depicting the subject in a situation loosely related to the suggested pseudoevent. The parents of 46 university undergraduates provided us with brief descriptions of school-related events experienced by their children in grades 5 or 6 and in grades 3 or 4, along with the child's class photograph for each of the two corresponding years and for grade 1 or 2. Parents also confirmed that, to the best of their knowledge, their child had not experienced our target false event. Each participant was individually interviewed twice in person, with an intervening telephone interview. In the first interview participants were asked to remember the grade 5/6 event, followed by the grade 3/4 event, followed by the grade 1/2 event. The last of these (the false narrative) suggested that the participant and a classmate had put "Slime" (a gooey toy substance) into the teacher's desk while the teacher was out of the room. The follow-up telephone and final interviews focused on the target event. By random selection, half of the participants were shown the corresponding class photo when asked to recall each event. The procedure for the two conditions was otherwise identical.

Some previous studies in this area have differentiated between "partial" and "complete" false memories. The criteria to define these categories (and the exact labels used to refer to them) have varied across studies. In our study, judges blind to condition rated typed transcripts of participants' spoken interview responses and judged whether the participant (a) believed that s/he remembered the suggested event ("memories"), (b) accepted that the event happened and reported images relevant to the suggested event but did not seem to believe that s/he remembered it, or (c) reported neither memories or images of the suggested event. Here we focus exclusively on reports classified as memories of the suggested event.

Consistent with prior research, at the end of the final interview 27% of the participants in the no-photos condition were classified as reporting memories of the suggested pseudoevent.<sup>5</sup> As in the prior studies, those false-memory reports presumably arose from the suggestive influence of the narrative describing the pseudoevent, in a context in which participants believed their parents had supplied the narrative as a true story of something that had happened to them, and in which the experimenter encouraged them to work at remembering that event. Our main interest was in whether or not adding the class photograph to those suggestive influences would increase the percentage of participants who reported memories of the pseudoevent. Indeed it did: At the end of the final interview 65% of those shown the class photo were classified as reporting memories of putting Slime in their teacher's desk (the highest rate of apparent false memories yet reported in the literature).

It is worth emphasizing that the class photographs in this study did not depict the pseudoevent. Indeed, the photographs rarely if ever depicted the classroom or the teacher's desk, let alone the Slime prank itself. The photographs did, however, depict the participant and his or her classmates (one of whom was allegedly the participant's collaborator in the Slime prank) as well as the teacher. We speculate that these elements of the photographic image encouraged and supported subjects' imaginations of what the Slime prank would have been like, thereby enabling many of them to imagine the event with a degree of perceptual vividness more characteristic of memories than of fantasies. Of course, there are important differences between false memories of a harmless school prank and false memories of incestuous abuse. Nonetheless, an individual who has been led to believe she or he has a non-remembered history of incestuous abuse, and who reviews family photographs looking for cues to such memories, may be influenced to fabricate vivid images of events that are not depicted in the photographs themselves but that involve people and contextual details (e.g., articles of clothing, furniture, etc.) represented in the photographs.

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<sup>5</sup> Our criteria for "false memories" were comparable to what some other researchers have terms "complete" or "clear" false memories.

## The Incompleteness of Autobiographical Memory and Susceptibility to Suggestion

The incompleteness of normal autobiographical memory (dramatically evidenced in the diary studies described earlier) likely heightens susceptibility to suggestive influences regarding childhood pseudoevents. For one thing, studies have shown that, all else being equal, suggestions are more likely to lead to false reports if they concern poorly remembered than well remembered materials (e.g., Heath & Erikson, 1998). Thus the fact that much of childhood is poorly remembered likely makes it easier to foster the development of false memories of childhood than adulthood pseudoevents.

The evidence reviewed in this chapter also suggests that it is normal for people to forget many of their childhood experiences, but people seem to assume that their autobiographical memories are largely complete. Consequently, individuals who are encouraged to try to remember childhood events are likely to be surprised by how little they remember. Moreover, trauma-memory-oriented therapists and self-help books sometimes claim that incomplete memory for childhood is indicative of abuse, and clients or readers who accept that claim may interpret the paucity of their memories of childhood as evidence that they must indeed have been abused.

Consistent with that possibility, Winkielman and Schwarz (2001) reported a very clever study in which participants were led to believe that poor memory of childhood either (a) indicates a normal, happy childhood (things flowed along smoothly so there's not much to remember) or (b) indicates a troubled childhood (bad things happened so memories were repressed). Participants were subsequently asked to report on either a small or a relatively large number of memories of childhood experiences. Later, all participants completed a questionnaire that included ratings of the happiness of their childhoods. The key finding was that participants rated their childhoods as less happy if they had been both (a) led to believe that poor memory for childhood is indicative of a troubled childhood and (b) asked to remember a relatively large number of childhood events.

## Conclusion

People seem to assume that they remember all of the “memorable” (that is, important, dramatic, and significant) events of their lives. Yet our findings (and especially the results of the diary studies) indicate that people quite often forget seemingly memorable autobiographical events. It may be that a systematic bias leads people to have inaccurate intuitions about the likelihood of forgetting dramatic childhood experiences: Adults can recollect all of the important, dramatic, consequential childhood experiences that they can recollect, and they rarely encounter evidence of the important, dramatic, consequential childhood experiences that they have forgotten. If you don't know that you experienced a particular event, how would you know that you have forgotten it?

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