

Autobiographical Memories, Hypnotizability, and Suggestion

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■ In this chapter, we summarize research we have conducted in our laboratory on autobiographical memories, and we present new findings pertinent to the relation between early memories and dissociation, fantasy proneness, and hypnotizability. Additionally, we present the correlates of a scale of early memories we developed. The research we report highlights the malleability of early memory reports, and demonstrates that memories prior to the cutoff of infantile amnesia (age 2) can be readily elicited by suggestive hypnotic and nonhypnotic procedures. Furthermore, the age of early memories reported was associated with objective and subjective measures of hypnotizability even when the testing context of hypnotizability and memory assessment were separated.

Autobiographical memories are the “stuff of life.” the threads of the narratives we tell to ourselves and others. Because of the integral relation between our perceptions of ourselves and others, it is not surprising that psychotherapists have long deemed autobiographical memories as essential to understanding the psychological dynamics of their patients. Alderian clinicians (Adler, 1927; Wieland & Steisel, 1958), for example, believe that very early memories provide a window to current mental status and functioning. More recently, Olsen (1979) voiced a belief shared by many therapists that “[early memories] when correctly interpreted often reveal very quickly the basic core of one’s personality or life-style, and suggest important, bedrock themes with which the therapist must currently deal in treating the client” (p. xvii).

As important as such early memories have been regarded, questions concerning their reliability and how much faith we can place in their veracity have recently become the subject of intense debate (see Loftus, 1993; Lynn & McConkey, 1998). The major focus of this debate centers around the accuracy of memories of childhood events such as childhood abuse. For therapists who work with clients who report early memories or recover seemingly long buried memories of childhood abuse, several questions are of vital importance: How much of what clients take for granted as “reality” is actually fantasy? Can we trust our clients’ memories? How pervasive are distortions of

memory? Do hypnosis and other therapeutic techniques pose special risks of false memory creation (see Lynn, Lock, Myers, & Payne, 1997)?

Two distinct viewpoints have evolved around these issues. On the one hand, there are therapists (Bass & Davis, 1988; Forward & Buck, 1988) who accept most of what clients say as accurate, and do not hold much stock in the idea that serious memory distortions arise as a function of ordinary psychotherapeutic procedures. When clients recall memories of sexual abuse, for example, the memories are regarded as reasonably accurate portrayals of historical events. When memories of abuse are seemingly recovered or suddenly become available to consciousness during therapy, it is thought that memories emerge when trauma-related repression or dissociative barriers are lifted. Furthermore, whereas human memory is thought of as serviceable under ordinary conditions, certain incest resolution therapists (Frederickson, 1992) maintain that gaps in memory for the events of childhood are evidence of forgotten childhood sexual abuse.

On the other hand, there is a growing chorus of voices (see Lynn & McConkey, 1998) that questions whether reports of childhood abuse by adults who have participated in psychotherapy are exaggerated, and whether therapists create the very problems they set out to treat by the use of subtle and not so subtle techniques such as hypnosis and guided imagery. Individuals who underscore the potential dangers of false memories are likely to buttress their arguments with studies which indicate that people can be led to endorse a variety of false beliefs and memories ranging from being lost in a shopping mall as a young child (Loftus, 1993; Loftus & Ketcham, 1994; Loftus & Pickrell, 1995), to playing with toys that had not yet been released (Sivec & Lynn, 1996), to recalling complex events such as having spilled a punch bowl on the parents of the bride at a wedding reception (Hyman, Husband, & Billings, 1995). In fact, there is converging evidence that memories of events that never happened are not uncommon, and that people can be confident in the accuracy of such illusory memories (see Ceci & Loftus, 1994; Lindsey & Read, 1994; Lynn et al., 1998). A variety of personal and situational factors have been implicated in the creation of false memories including suggestibility, the plausibility and base rate of occurrence of the suggested event, and expectancies and schemas pertaining to the event-to-be-recalled (see Lynn, Myers, & Malinoski, 1996).

Unfortunately, one of the reasons why divergent claims about memory and its vicissitudes are difficult to evaluate is that relatively little is known about autobiographical memories in the general population. Indeed, well validated measures of autobiographical memories do not exist to assess individual differences in autobiographical memories. Furthermore, until recently, little attention has been devoted to understanding the determinants of early memory reports and the way in which divergent procedures shape such reports.

In this chapter, we summarize research we have conducted in our laboratory on autobiographical memories, and we present new findings pertinent to a scale of early

memories we developed and to the relation between early memories and dissociation, fantasy proneness, and hypnotizability. Finally, we examine the malleability of early memory reports and the effects of the hypnotic context on such reports.

We have been particularly interested in ascertaining the plasticity of memory reports by determining whether and under what circumstances participants will report memories that cross the threshold of infantile amnesia of 2 years of age. Most adults' earliest reported memories date back to between 36 and 60 months of age (see Malinoski, Lynn, & Sivec, 1998 for a review). Virtually all contemporary memory researchers agree that accurate memory reports of events that occur before 24 months of age are rare (Kihlstrom & Harackiewicz, 1982; Sheingold & Tenny, 1982; Usher & Neisser, 1993; Howe & Courage, 1993). This inability to recall very early life events is known as "infantile amnesia," a phenomenon attributable to developmental changes that influence how children process, retrieve, and share information (Howe & Courage, 1993, 1997; Nelson, 1993). These very early memories are significant because adults' memory reports from 24 months of age or earlier are likely to represent confabulations, condensations, and constructions of early events, as well as narrative scripts that reflect current concerns and stories heard about early events (Last & Bruhn, 1983; Loftus, 1993).

The first study we conducted in the series reported herein was designed to examine individual differences and correlates of personal memories and the age of earliest memory reports in the college population. To do so, we developed the Autobiographical Memory Scale (AMS), which permitted us to approach the question of what is "normal" memory? That is, at what age do college students report they can recall events during childhood? If very few people can remember events that occur during the early years of life, it would challenge the idea that it is necessary to invoke constructs such as repression or dissociation as explanatory mechanisms to account for the failure to report early memories. That is, normal forgetting may be at the heart of certain recall problems. Our research on the AMS will be presented in somewhat greater detail than the studies that follow insofar as detailed descriptions of the scale and its development have not been included in the literature to date.

Our research on the AMS addressed the following questions: (1) What percentage of people report events that occur during the first year or two of life? (2) What is the relation between and among the perceived detail, vividness, and accuracy of memories? Can we predict the perceived accuracy of memories from subjects' ratings of the detail and vividness of their memories? (3) Is there a relation between autobiographical memories and measures of psychopathology and child abuse? (4) Are subjects who report the earliest childhood memories more fantasy prone than subjects who report later memories?

Wilson and Barber (1981) described the characteristics of high hypnotizable subjects who reported a long history of fantasy and imaginative involvements dating back to childhood. These fantasy prone subjects achieve a great deal of satisfaction from fan-

tasy and imaginative involvements, report the ability to experience hallucinated images as "real as real," out of body and paranormal experiences, the ability to achieve orgasm by imagination alone, vivid hypnagogic and hypnopompic images, and physiological reactions to observed violence on television and the movies. Significantly, fantasy prone subjects also report very vivid memories of childhood and problems in differentiating fantasy and reality. (5) Are subjects who are most dissociative more likely to report later memories than relatively less dissociative subjects? (7) And finally (in our second study), is there a relation between hypnotizability and autobiographical memories?

Study 1

Volunteers in our first study received course credit for their participation (N=225; 67 males, 157 females; one subject did not indicate gender; predominantly white: >95%), and ranged in age from 17.6 to 26.4 years (M=19.3, SD=1.2). Males (M=19.6, SD=1.3) were about 5 months older than females (M=19.2, SD=1.2).

The study was presented as two separate studies, was conducted by two graduate students (one/study), and subjects completed separate consent forms to enhance the perceived separation of the two studies. Separation of the test contexts was done to insure that context-based expectancies did not mediate the research outcomes and inflate correlations among the test measures.

The first study was presented as an investigation of personal memories. The Autobiographical Memory Scale (AMS) consists of sets of questions about 18 memories in three major sections: early life events, earliest memory, and historical events. The AMS instructions inform subjects that we are interested in their memory for events and not facts that they may have learned about these events at later dates, and asks subjects to do their best to distinguish memories of real events from what they later learned

Table 1: Frequency of earliest memory report in different age ranges.

Age Range	Females		Males		Total sample	
	N	%	N	%	N	%
0-11	2	1.4	0	0.0	2	1.0
12-23	10	7.0	0	0.0	10	5.0
24-35	22	15.5	6	10.5	28	14.0
36-47	53	37.3	22	38.6	76	38.0
48-59	33	23.2	17	29.8	50	25.0
60-71	12	8.5	7	12.3	19	9.5
72-83	6	4.2	2	3.5	8	4.0
84-95	3	2.1	1	1.8	4	2.0
96-107	0	0.0	0	0.0	0	0.0
108-119	1	0.7	1	1.8	2	1.0
120+	0	0.0	1	1.8	1	0.5
Total	142	100.0	57	100.0	200	100.0

about the events.

In the early life personal events section, participants are asked to separately describe in writing each of their first five birthdays, their first day of first grade, and the circumstances around and the loss of their first tooth. After subjects describe each event, they rate it according to three 5-point scales of detail (1=no details, 3=some details, 5=many details) and vividness (1=not vivid, 3=somewhat vivid, 5=very vivid) of the event, and accuracy of recall (1=not accurate, 3=moderately accurate, 5=very accurate) of the event. If there is no memory for an event, subjects were instructed to endorse the low anchor on these three items. Summary scores for early life personal detail, vividness, and accuracy are generated by summing the respective ratings for each of the relevant items across the seven memories. Participants are also asked to report their memory of the first day of high school in this section, and to rate the detail, vividness and accuracy of their report, but these ratings are not included in the summary scores.

The earliest memory sections consisted of a single memory report. Participants were requested to describe their earliest memory, including their age at the time the recalled event occurred. They also rated the detail, vividness, and accuracy of their memory.

The historical events section queried the participants for their memories of the 1976 Bicentennial, the Chernobyl crisis, the space shuttle Challenger explosion, the tearing down of the Berlin Wall, the scorching of singer Michael Jackson's hair in a commercial, the U.S. bombing of Libya, and Baby Jessica's falling into the well (and subsequent rescue). These events were selected on the basis on pretesting with a group of 15 undergraduates as some of their most memorable historical events from 1976 to 1989. All participants were asked to indicate their age at the time the event occurred. In addition, as in the previous events, participants rated the detail, vividness and accuracy of each of the memories; if there was no recall of the event, the low anchor was to be endorsed. Historical summary scores were generated by summing the ratings for detail, vividness, and accuracy across all seven events.

The second (part) study was distinguished from the first, and was contextually distinct, insofar as it was presented as an experiment entitled, "Life Experiences". Subjects received a measure of fantasy proneness, the 52-item (true/false) Inventory of Creative Memories and Imaginings of Wilson and Barber (1981); the Control Scale of Lynn and Segal (1996), a measure of cognitive, affective, and imaginal control; the global severity (of psychopathology) scale from the Revised SCL-90 (Derogatis, Lipman, & Covi, 1973), a 90-item self-report measure of symptoms frequently observed in psychiatric outpatients; the 8-item Childhood Sexual Victimization Questionnaire (CSVQ), adapted from Finkelhor (1979); the 28-item Dissociative Experiences Scale (DES, Bernstein & Putnam, 1986), and the Sexual Abuse Checklist (Zelikovsky & Lynn, 1996), a 12-item checklist culled from Briere's list of symptoms purportedly associated with child abuse. Embedded in these items were 12 items from an infrequency scale that was comprised of items that subjects who were careless or unmoti-

might answer in the affirmative. A sample item is, "I have never said hello to someone who wore eyeglasses."

On the AMS, participants were provided a space to indicate the age of their earliest memory; most indicated their age in years only (not months), so our measurement of the mean age of earliest memory is crude and probably an underestimate of the true value. Twenty-five of the participants did not indicate the age of their earliest memory, but all subjects provided detail, vividness and accuracy ratings for their earliest memory.

Age of earliest memory

The analyses of subjects' early memories was informative. The mean age of earliest memory reported was 3.47 years ($SD=1.46$), comparable to the findings in other studies. Males ($M=3.84$, $SD=1.52$, $N=57$) reported earliest memories from about six months later in life than females ($M=3.32$, $SD=1.42$, $p=.02$). Table 1 lists the frequency of the earliest memory report in each of the age ranges. Notably, two female participants (1.4% of females) reported memories from before their first birthday, and an additional 10 females (7.0% of females) reported earliest memories from between 12 and 24 months of age; none of the males reported an earliest memory from before 24 months of age, a significant sex difference, according to Fisher's exact test, $p=.021$. The largest percentage of subjects (33.8%) indicated their memories were from 36 to 48 months. The great majority of the participants (83%) claimed to remember an event from the first 5 years of life (0-60 months).

Personal memories

Descriptive statistics and alpha reliabilities for the detail, vividness, and perceived accuracy scales for the seven personal memories are listed in Table 2 (including alpha (a) reliabilities). The alpha reliabilities ranged from .58 to .68, indicating lower internal consistency than desired, but adequate for exploratory purposes as the scale includes only seven items. On average, participants rated the detail ($M=3.32$), vividness ($M=3.32$), and perceived accuracy ($M=3.30$) of their earliest memory just above the midpoint on the respective scales. Detail correlated with vividness and perceived accuracy at .89 and .76, respectively, and vividness and perceived accuracy correlated at .76 (all $ps < .001$). In short, higher ratings of detail and vividness predicted higher levels of perceived accuracy.

Males reported significantly less detail, vividness, and perceived accuracy with respect to their personal memories than females (see Table 2). The summary ratings of detail, vividness, and perceived accuracy across the seven early personal memories correlated at -.35, -.37, and -.31 (all p values $< .001$) with the age of the very earliest memory reported, suggesting that participants who report detailed, vivid, and perceived accurate early personal memories are more likely to report earliest first memories. Interestingly, there was virtually no relationship between age of earliest memory and rated detail, vividness, and perceived accuracy (r 's = .07, .02, and .04, respectively).

Historical memories

Descriptive statistics and alpha reliabilities for the detail, vividness and perceived accuracy of the memories of historical events are listed in Table 2. The alpha reliabilities were in the .63 to .66 range, suggesting adequate internal consistency for exploratory analyses. Detail correlated with vividness at .87 and with perceived accuracy at .87. Vividness and perceived accuracy correlated at .85 (all $ps < .001$). Again, the scales were highly correlated such that higher ratings of detail and vividness predicted higher levels of perceived accuracy. Interestingly, males reported recalling the historical event in greater detail than females, but there were no differences in vividness or perceived accuracy ratings. The summary ratings for detail, vividness and perceived accuracy across the historical events correlated weakly but significantly with the age of the earliest memory (r values of -.16, -.17, and -.16, all p values $< .05$) such that participants who report more detailed and vivid memories with higher accuracy ratings are more likely to report earlier first memories. The percentage of subjects reporting each of the historical memories is listed in Table 3.

Fantasy Proneness

Fantasy proneness (as measured by the ICMI) correlated modestly with the age of earliest memory correlated at -.20 ($p = .004$) such that the more fantasy-prone participants were, the more likely they were to report an earlier first memory. Wilson and Barber (1981) identified the top 4% of the population in fantasy proneness as "fantasizers." The most highly fantasy prone (top 4%, $N=9$, $ICMI>36$) participants in our sample were compared to the remainder of the sample on age of earliest memory. Fantasy prone individuals on average reported memories from nearly nine months earlier ($M=2.78$ years) than less fantasy prone ($M=3.50$), but this difference did not reach statistical significance due to small sample size. Similarly, no differences were detected between fantasizers and the remainder of the sample on the detail, vividness, or perceived accuracy of the earliest memory. Fantasy proneness was uncorrelated with the detail, vividness, and perceived accuracy of the earliest reported memory, but did correlate significantly with the respective summary scores for early personal memories (r 's = .18, .21, and .18, respectively, all p 's $< .01$) but not for the early historical memories (r 's = .03, .07, and .11, respectively, all p 's $> .05$).

To examine whether subjects who reported memories during these early years were more fantasy prone than subjects with later first memories, we divided subjects into a group of 12 subjects who reported their earliest memory during the first year of life or earlier, a group of 14 subjects whose first memory occurred in the seventh year of life or later, and a group of 15 subjects who were randomly selected from the mid range of recall of life events. We found that subjects who reported the earliest memories were more fantasy prone than were subjects in the two comparison groups. Furthermore, the early recallers rated their memories as more vivid and more detailed than the subjects in the two comparison groups.

Table 2: Difference Between Males (N = 67) and Females (N = 156) on Memory Variables.

Males			Females			T	df	95% CI	p	a
Mean	SD		Mean	SD						
Earliest Memory Ratings										
Detail*	3.10	0.97	3.43	1.12	2.21	143	(-0.62, -0.35)		.029	
Vividness	3.08	1.22	3.43	1.28	1.87	222	(-0.71, 0.02)		.063	
Accuracy	3.06	1.24	3.41	1.25	1.91	222	(-0.71, 0.01)		.057	
Personal Memories										
Detail	10.27	3.04	11.75	3.71	2.87	222	(-2.49, -0.46)		.000	.58
Vividness	9.81	3.20	11.24	3.90	2.66	222	(-2.50, -0.37)		.008	.63
Accuracy*	9.99	2.99	12.10	4.66	4.05	188.3	(-3.15, -1.09)		.001	.68
Historical Memories										
Detail	23.00	4.92	21.30	4.39	2.55	221	(0.39, 3.01)		.011	.63
Vividness	21.94	5.34	20.84	4.78	1.52	222	(-0.32, 2.52)		ns	.64
Accuracy	22.27	4.87	21.07	5.19	1.61	220	(-0.27, 2.67)		ns	.66

* If Levene's test for equality of variances resulted in $p < .01$, t-test for unequal variances was used, and the reduced number of degrees of freedom reported.

Dissociation

Dissociation was also not correlated with any of the summary scores for detail, vividness, and perceived accuracy for the earliest memory or the summary scores for the personal memories or historical memories. Dissociation did correlate modestly with the ICMI ($r=.29$, $p<.001$), supporting previous research that has shown that there is significant overlap between the constructs of dissociation and fantasy proneness (Lynn, Neufeld, Green, Rhue, & Sandberg, 1996). Moreover, dissociation was strongly correlated with reported psychological symptoms as measured by the SCL90-R ($r=.58$, $p<.001$), buttressing the contention that dissociation is reliably associated with general psychopathology (Tillman, Nash, & Lerner, P.M., 1994).

Carlson, Putnam, Ross, Torem, Coon, Dill, Loewenstein and Braun (1993) used a cutoff of 30 on the DES to differentiate between high dissociators and those with lower levels of dissociation. A series of t-tests with unequal variances for comparing more highly dissociative individuals (DES scores of 30 or greater, $N=9$) vs. lower scorers (DES scores < 30 , $N=213$, 3 subjects were missing DES scores) determined no differences between the groups on the age, detail, vividness, or perceived accuracy of the earliest memory. Similarly, when a lower threshold was used to define highly dissociative people (DES ≥ 25 , $N=18$) as used in Horen, Leichner and Lawson (1995), no differences were found on the memory variables.

Sexual Abuse

Fourteen of 143 females (9.7%) and 3 of 64 males (4.7%) were classified as sexually abused, based on the CSVQ. Sexually abused participants reported earliest memories from more than a year earlier ($M=2.50$) than those not abused ($M=3.55$), $p=.006$. As

Table 3: Percentage Reporting Recall of Personal Memories (detail rating > 1).

Event	males		females		Total Sample	
	N	%	N	%	N	%
First birthday	1	1.5	6	3.8	7	3.1
Second birthday	1	1.5	2	1.3	3	1.3
Third birthday	8	11.9	18	11.5	26	11.6
Fourth birthday	11	17.9	49	31.2	61	27.1
Fifth birthday	19	28.4	69	43.9	88	39.1
First day of first grade	44	65.7	109	69.4	154	68.4
Loss of first tooth	27	40.3	77	49.0	104	46.2
Bicentennial	11	16.4	11	7.0	22	9.8
Chernobyl	40	59.7	46	29.3	86	38.2
Challenger explosion	66	98.5	156	99.4	223	99.1
Berlin Wall	60	89.6	138	87.9	199	88.4
Michael Jackson's hair	56	83.6	124	79.0	181	80.4
Bombing of Libya	47	70.1	45	28.7	93	41.3
Baby Jessica in the well	55	82.1	150	95.5	205	91.1

can be seen in Table 4, sexually abused participants rated their perceived accuracy of the earliest memories substantially lower than the non-sexually abused participants. No differences between sexually abused and nonabused participants were detected in ratings of detail or vividness in the earliest memory were detected. Sexually abused participants did report significantly more vivid personal memories than the nonabused participants, and demonstrated a trend toward reporting more detail and greater perceived accuracy than the nonabused participants. No differences were detected in the summary detail, vividness, and perceived accuracy for the historical memories, nor for the DES or the SCL90-R. Sexually abused participants did score nearly four points higher on the ICMI than nonabused participants, suggesting that they may be more fantasy-prone, and confirming previous findings of Rhue, Lynn, and Sandberg (1995).

In summary, our first study provided normative data that reinforced the observation that age 2 is a reasonable cutoff for infantile amnesia. That is, only a small minority of participants report memories prior to age 2. Furthermore, our results indicate that there are certain persons in the population who: (a) recall events that are covered by infantile amnesia and are unlikely to be accurate; (b) recall these events with greater perceived detail and vividness than do persons who recall later memories; and (c) are more fantasy prone than persons who recall events later in life.

Our study provided no support for the hypothesis that dissociation is associated with poor recall of early life events. Our data suggest that the failure to recall early life events should not be taken by therapists as prima facie evidence that a person is dissociative or the victim of sexual abuse. In fact, persons who reported sexual abuse reported earlier and more vivid personal memories than non-abuse reporters.

Taken together, our research provides construct validity for the AMS. Although our

measure of autobiographical memories is not confounded by psychopathology or dissociation, as we expected, a relation between autobiographical memory and fantasy proneness did emerge.

Study 2

In a second study, we discovered that all three indices of autobiographical memory were associated with objective and subjective measures of hypnotic responsiveness. In this study, we examined the relation between the AMS and hypnotizability when it was administered in the context of a hypnosis experiment, and when the test contexts of hypnosis and memory evaluation were separated. This was done in order to determine whether context effects were relevant in the case of the assessment of autobiographical memories.

Context effects in hypnosis research were first isolated formally by Council, Kirsch, and Hafner (1986) who found that the usual modest relation between hypnotizability and absorption was vitiated when the two measures were administered in entirely separate test contexts, so that subjects were unaware of any connection between the two measures. Since their initial demonstration, context effects have been shown to be operative not only in the measurement of absorption but also in the measurement of hypnotizability and dissociation, bulimic symptoms, mysticism, daydreaming frequency, and beliefs in paranormal phenomena (see Council, Kirsch, & Grant, 1996, for a review).

The Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A, Shor & Orne, 1962) and the AMS were administered to 77 subjects in an experiment entitled, "Hypnosis" on the sign-up sheet, and later described by the experimenter as, "Hypnosis and Autobiographical Memory." Subjects were informed that the experiment was designed to determine the relation between hypnosis and personal memory. After subjects were administered the Harvard Scale and self-scored it for objective responding, suggestion-related subjective involvement, and suggestion-related involuntariness, they received the AMS. As in Study 1, separate scores were derived for detail, vividness, and accuracy that represent the sum of the subjects' responses to the personal items on the AMS. The obtained correlations delete between self-scored hypnosis dimensions and measures of detail, vividness, and accuracy of memory ranged between .23 and .34 ($p < .01$).

We also tested 73 subjects in what was presented as two separate experiments, one entitled "Hypnosis" and the other entitled, "Autobiographical Memory". Even when the contexts were separated, the correlations ranged between .22 and .35 ($p < .01$) for the measures of hypnosis and memory. Context effects were not apparent when correlations between in and out of hypnosis context measurements were converted using Fisher's z-transformation and compared. Furthermore, multiple regression analyses indicated that interaction effects between the test context and the hypnosis scales did not account for unique variance in any of the memory scale scores. Conversely, the test context and the memory scale scores failed to interact to account for unique variance in any of the hypnosis scores. In short, context effects were not evident in this research.

Table 4: A Comparison of Sexually Abused vs. Not Sexually Abused Reporters

	Sexually Abused		Not Sexually Abused		T	df	95% CI	p
	Mean	SD	Mean	SD				
Earliest Memory								
Detail Rating*	3.06	0.56	3.35	1.13	1.84	28.3	(-0.03, 0.61)	.076
Vividness Rating	3.00	1.17	3.34	1.28	1.08	223	(-0.29, 0.98)	.202
Accuracy Rating	2.64	1.12	3.36	1.25	2.26	223	(0.92, 1.33)	.025
Personal Memories								
Detail*	13.52	5.23	11.11	3.36	1.87	17.1	(-5.14, 0.30)	.078
Vividness	13.12	5.23	10.61	3.56	2.69	223	(-4.35, -0.67)	.008
Accuracy	13.41	5.28	11.29	4.22	1.95	222	(-4.26, 0.02)	.052
Historical Memories								
Detail	22.41	5.41	21.77	4.54	0.55	222	(-2.93, 1.65)	ns
Vividness	21.41	6.19	21.13	4.86	0.22	223	(-2.75, 2.19)	ns
Accuracy	21.82	5.41	21.40	5.09	0.33	221	(-2.96, 2.12)	ns
DES	13.53	9.99	11.56	8.49	0.89	220	(-6.38, 2.42)	ns
ICMI*	27.00	4.37	23.21	7.70	-3.19	25.0	(-6.23,-1.33)	.004
SCL90-R	81.29	48.89	78.37	57.80	0.20	212	(-31.4, 25.6)	ns

* If Levene's test for equality of variances resulted in $p < .01$, t-test for unequal variances was used, and the reduced number of degrees of freedom reported.

This justified the pooling of the in and out-of-context data. These combined correlations were all highly significant ($p < .001$), and ranged between .25 and .34.

These data indicate there is a small-to-moderate degree of association between objective and subjective measures of hypnotizability and different dimensions of autobiographical memories. Hence, the more hypnotizable a person is, the more likely he or she will report vivid, detailed, and accurate memories. Interestingly, because these findings do not vary as a function of the conditions of testing, the result stands in contradiction to most other studies that have shown context dependent relationships between hypnotizability and a variety of personal attribute measures. Only fantasy proneness appears to have a context independent relationship with hypnotizability (see Council et al., 1996).

Unfortunately, just because a memory is more confidently reported does not mean that it is accurate. Indeed, our research indicates that a sizable number of college students can come to believe in the accuracy of events that are covered by infantile amnesia. One possible explanation for the association between hypnotizability and autobiographical memories is that hypnotizable subjects adopt a relatively lax criterion both for acknowledging that they experience a suggested effect and for experiencing and/or reporting a memory or fantasy as a historical event. This may help to explain the finding that highly hypnotizable subjects are more prone to pseudomemories and the biasing effects of leading questions than their less hypnotizable counterparts (see Lynn et al., 1998). If subjects are confident of vivid and detailed suggested memories, then they may come to confuse them with historical reality. Because confidently reported vivid

and detailed memories may be more credible than vague and unelaborated memories that are related with little or no confidence, therapists and clients may be more convinced of the veracity of the former memories, regardless of their historical accuracy.

The remainder of the studies we report address the malleability of autobiographical memories and the role of hypnosis in shaping such memories. The first study we conducted in this series illustrated that early memories are very malleable. We (Malinoski & Lynn, in press) recently tested 133 participants in an individual interview format and asked them to report their earliest memory until they twice denied additional recall. To enhance external validity, the interview included strong suggestions to promote earlier memory reports using nonhypnotic "memory recovery techniques" similar to those promoted by some therapists (e.g. Farmer, 1989; Meiselman, 1990). For example, after the initial memory reports, participants were asked to close their eyes, see themselves "in their mind's eye" as a toddler or infant, and to "get in touch" with memories of long ago. Participants were further informed that most young adults can retrieve memories of very early events—including their second birthday—if they "let themselves go" and try hard to visualize, focus, and concentrate. They were then asked for their second birthday memories, after which they were given additional instructions to visualize, concentrate, and focus on even earlier memories. Finally, participants were complimented and reinforced for increasingly early memories.

The participant's initial early memory report was 3.70 years, well within the range of ages typically reported for earliest memories in previous studies (see Malinoski et al., 1998). Only 11% of the participants reported memories earlier than age 2. However, after the visualization instructions, 59% of the participants reported a birthday memory, and the final earliest memory reported was, on average, 1.60 years. Moreover, 78% of the participants reported a memory at 24 months or earlier, 33% reported a memory at 18 months or earlier, 18% reported a memory at six months or earlier, and 4% of the participants reported a memory during the first week of life. This study provides a striking demonstration of the malleability of early memory reports when participants are confronted with a variety of instructions and incentives that promote early memory reports, not unlike those used by memory recovery therapists (e.g., visualization, lowered criterion for memory reports, rewards for recall).

This study also found that three dimensions of hypnotizability (i.e., objective responding, subjective involvement, and involuntariness) were correlated with the report of a memory of the second birthday, and involuntariness ($r = .27$) and subjective involvement ($r = .22$) were significantly correlated with the age of the earliest memory, as was a compliance measure of yielding to leading questions. The hypnosis findings are consistent with previous research which indicates that highly hypnotizable individuals generate more pseudomemories in nonhypnotic contexts than medium or low hypnotizable persons (see Lynn et al., 1996).

In a second study in our laboratory, Lynn, Malinoski, and Green (1997) demonstrated that a slight change in wording (i.e., "Tell me when you get an earlier memory"

/high expectancy versus "If you don't remember, it's alright"/low expectancy) resulted in a difference of average recall of nearly one year across instructional conditions ($M = 2.48$ years high expectancy versus $M = 3.45$ years low expectancy). By the end of 4 recall trials, 43% of participants in the high expectancy condition reported a memory at or before 2 years of age, compared with 20% of participants in the low expectancy group.

These findings are consistent with an abundance of literature underlining the impact of expectancies on memory (Hirt, Lynn, Payne, Krackow, & McCrae, in press). Recently, Spanos, Burgess, Samuels, and Blois (in press) showed that it is possible to structure expectations to elicit complex, vivid, and detailed memories of the day after birth by providing participants with a plausible rationale for the recall of such memories. This research, and a subsequent replication and extension conducted by Dubreuil, Garry, and Loftus (1998), revealed that more than half of the participants (87% Spanos et al.; 60% Dubreuil et al., 1998) reported memories of a mobile hanging over their hospital bed after they were informed that their personality type ("High Positive Cognitive Monitors") was associated with their being born in hospitals with swinging colored mobiles that facilitated eye coordination and visual exploration.

A question we have not yet addressed is whether hypnosis has an effect on early memories. Sivec, Lynn, and Malinoski (1997a) recently examined the influence of the hypnotic context on very early memory reports by interviewing 40 hypnotized and 40 nonhypnotized participants about their earliest memories. The first time they were asked to report their earliest memory, only 3% of the nonhypnotized participants recalled a memory earlier than two years. However, 23% of the hypnotized participants reported a memory earlier than age 24 months, 20% reported a memory earlier than 18 months, 18% reported a memory earlier than a year, and 8% reported a memory of earlier than 6 months. The second time they were asked for an early memory, only 8% of the nonhypnotized participants reported a memory earlier than two years, and only 3% reported memories of 6 months or earlier. In contrast, 35% of hypnotized participants reported memories earlier than 18 months, 30% of participants reported memories earlier than a year, and 13% of participants reported a memory before 6 months. Although accurate recall of events at this very early age is implausible, the researchers did not corroborate participants' memories.

Corroboration of early memories was attempted by Nash, Drake, Wiley, Khalsa and Lynn (1986) who compared the early memories of hypnotized and nonhypnotized participants who participated in a prior age regression experiment. This experiment involved age regressing hypnotized and nonhypnotized role playing (i.e., simulating) participants to age 3 years to a scene in which they were in the soothing presence of their mothers. During the experiment participants reported the identity of their transitional objects (e.g., blankets, teddy bears). Third-party verification (parent report) of the accuracy of recall was obtained for 14 hypnotized participants and 10 simulation control participants. Despite the similarity to children in their way of relating to transition-al

objects, hypnotic participants were less able than control participants to correctly identify the specific transitional objects actually used. Hypnotic subjects' hypnotic recollections, for example, matched their parents' report only 21% of the time, whereas simulators' reports after hypnosis were corroborated by their parents 70% of the time. All recollections obtained during hypnosis were incorporated into posthypnotic recollections, regardless of accuracy.

In another study, Sivec, Lynn, and Malinoski (1997b) age regressed participants to the age of 5 and suggested that they played with a Cabbage Patch Doll if they were a girl or a He-Man toy if they were a boy. An important aspect of this study was that these toys were not released until two or three years after the target time of the age regression suggestion. Half of the participants received hypnotic age regression instructions and half of the participants received suggestions to age regress that were not administered in a hypnotic context. Interestingly, none of the nonhypnotized participants were influenced by the suggestion. In contrast, 20% of the hypnotized participants rated the memory of the experience as real and were confident that the event occurred at the age to which they were regressed.

Conclusions

In summary, studies that have compared memory reports elicited in hypnotic and nonhypnotic conditions have shown that hypnosis results in more implausible memories, a higher percentage of memories that are impossible to corroborate, and a higher percentage of reports of events that could not have occurred at the target age. The studies reviewed reveal that certain early memory reports are imaginative constructions that are subjectively compelling yet inaccurate.

At this point, we forward a hypothetical path by which suggestions can distort memories in the clinical situation in which psychological abuse is suspected. The literature on the aftereffects of child abuse (Zelikovsky & Lynn, 1993) reveals that a variety of problems, such as depression, anxiety, and sexual problems and acting out have been associated with child abuse. However, the literature does not suggest that these symptoms alone, or in combination, are specific to child abuse. That is, many clients who were not abused exhibit these symptoms. Nevertheless, if a connection is perceived between a particular symptom and a possible history of abuse, the very fact that the client exhibits the symptom might constitute a suggestion to the client or therapist that a history abuse is at the root cause.

With respect to pseudomemory creation, what may be significant is not so much any particular symptom as the fact that for some reason clients come to believe that abuse provides a plausible explanation for symptoms or problems. Suggestions that abuse is at the root of the client's problems may derive from any number of sources, including information conveyed about abuse from the media, friends, family members, and the therapist. Clients seeking help actively search for and evaluate information that will serve to explain their feelings of distress and inability to cope with demanding situations.

ons. In fact, clients in this phase of "relief-seeking" may be particularly vulnerable to suggestive influences conveyed by a therapist who, out of the client's needs and the therapist's expertise, comes to be viewed as a trusted authority figure. Given this state of affairs, it is not surprising that clients often express great relief when they are able to frame present difficulties in terms of past difficulties. Hence, the process of "coming to an understanding" about symptoms and their formation can be highly reinforcing, whether or not the conceptual framework for understanding that is adopted has external validity. What is important, in this instance, may well be the "internal validity" that so-called insight has for the person. If alternative explanations of symptoms are not explored, and if the client's inability to recall early life events or abuse itself is viewed as a sign or suggestion that abuse, in fact, occurred, rather than a sign of the vagaries of human memory, then the client may be well along the path to the acceptance of a false memory of abuse.

However, other steps may well be necessary. Over time, subtle suggestions may be given by the therapist that abuse provides not only a plausible explanation for symptoms but also a sufficient explanation. All that may be required now is for the therapist to use suggestive techniques, such as hypnosis or guided imagery, in order for the client to report a memory of abuse. Recall that our research indicates that hypnotizable subjects may be more likely to view early memories as vivid and credible. And a growing body of research documents a relatively high degree of vulnerability of high hypnotizable subjects to the implantation of false memories with suggestions. It has also been suggested that other individual difference variables such as obsessive compulsive disorder and fantasy proneness might heighten pseudomemory risk. The use of suggestive procedures and leading questions may be sufficient to produce a false memory of abuse in some clients, but other clients may be prone to suggestive influences because they adopt a lax criterion for reporting that a suggested image is a real memory.

Certain incest resolution therapists such as Bass and Davis (1988) directly encourage their clients to adopt such a lax criterion by instructing clients along the following lines, and here we quote directly from Bass and Davis's book, *The Courage to Heal*: "Even if your memories are incomplete, even if your family insists nothing ever happened, you still must believe yourself. Even if what you experienced feels too extreme to be possible or too mild to be abuse, even if you think, 'I must have made it up,' ...you have to come to terms with the fact that someone did those things to you" (p. 87).

If the therapist reinforces the client for reporting a memory that is consistent with an abuse history, if the therapist ratifies or legitimates the memories, and if the memories that are uncovered serve to reduce the client's (and perhaps the therapist's) anxiety, then clients may come to view themselves as victims and weave their identity into the unfolding narrative of the psychotherapy. In most instances, we suspect that this insidious process occurs on the unconscious level, on the part of both the therapist and client.

Of course, it is a leap from the laboratory to the clinic, and a leap from mundane early memories to memories of childhood abuse. Moreover, our research has only limited

ted relevance to a number of the hypothesized steps to pseudomemory creation we have outlined. Nevertheless, our research implies that caution is appropriate with respect to very early memory reports: the fact that persons who report very early memories during the period covered by infantile amnesia confidently report that these memories are relatively vivid and accurate, implies that therapists may be tempted to give these memories greater credence than is probably warranted. The fact that those subjects who report early memories are also more fantasy prone than subjects who report later memories implies that they may be particularly vulnerable not only to confusing fantasy and reality but also to the biasing effects of suggestive questions.

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Hypnosis and Placebos: Response Expectancy as a Mediator of Suggestion Effects

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■ Data are reviewed indicating that responses to hypnotic suggestion and placebo effects share a common mechanism. These data show that response expectancy is a causal factor in the production of both of them. The reason for this is that both are subsets of a broader phenomenon: the phenomenon of suggestion. It is recommended that research on hypnosis be broadened so as to focus on the broader topic of suggestion, in and out of the hypnotic context.

Hypnosis is a procedure in which a person designated as hypnotist suggests changes in experience to a person designated subject (Kirsch, 1994; Kirsch & Lynn, 1995). A representative range of hypnotic suggestions are sampled in standardized scales of suggestibility, most of which are highly reliable and substantially correlated with each other (Council, 1999). Suggestions on these scales are of three basic types. Ideomotor suggestions are suggestions that a particular action, such as an arm rising in the air (arm levitation), will occur automatically, without awareness of volitional effort. Challenge suggestions are suggestions that the person cannot perform an act that is normally under voluntary control, such as bending an arm (arm rigidity). Cognitive suggestions are suggestions for various cognitive or perceptual distortions, such as selective amnesia, pain reduction, and hallucinations. Note that some cognitive suggestions contain challenges. Amnesia suggestions, for example, require that the person not recall particular information. Suggestions of this sort differ from challenge suggestions only in that what is inhibited is a cognition, rather than an action. Thus, divisions between types of suggestion are somewhat fuzzy. These hypnotic phenomena have been characterized as the "domain of hypnosis" (Hilgard, 1973). An adequate theory of hypnosis should be able to account for the full range of behavior contained in this domain.

There are many books and journal articles focusing on the topic of hypnosis and hypnotizability. In contrast, despite notable exceptions, such as the work by Amigó (1999) and Capafons (1999) at the University of Valencia, the broader subject of suggestion has been relatively neglected. There are historical reasons for this state of affairs. The effects of mesmerism and hypnosis have seemed so unusual that many