THE EFFECTS OF GUIDED IMAGERY AND GROUP INFLUENCE ON FALSE MEMORY REPORTS

Phillip L. Herndon Jr.

A Thesis Submitted to the
University of North Carolina Wilmington in Partial Fulfillment
of the Requirements for the
Master of Arts

Department of Psychology

University of North Carolina Wilmington

2006

Approved by

Advisory Committee

_____ _____

_____
Chair

Accepted by

_____
Dean, Graduate School

TABLE OF CONTENTS

ABSTRACT

The present study investigated if guided imagery and group influence affected the creation of false memory reports. Participants were told they probably experienced an early medical procedure that, in reality, they were unlikely to have experienced. Participants were assigned to one of four groups comprising a 2(Guided Imagery/No Guided Imagery) X 2(Group/No Group) between subjects design. All participants took part in a memory recovery session. For the guided imagery manipulation, participants were encouraged to recall the event after receiving either guided imagery or task motivation instructions. For the group manipulation, participants were randomly assigned to either individual memory recovery sessions or group sessions containing three confederates. All participants, regardless of condition, completed the Creative Imagination Scale (CIS), and the Gudjonnson Compliance Scale (GCS). The presentation order for these scales were counterbalanced with respect to the scale and the memory recovery session.

ACKNOWLEDGEMENTS

Many sincere thanks to Dr. Bryan Myers, whose unlimited patience, encouragement, and guidance made this possible. I would also like to thank my committee for there support and willingness to meet on short notice.

LIST OF TABLES

Table Page

THE EFFECTS OF GUIDED IMAGERY AND GROUP INFLUENCE ON FALSE MEMORY REPORTS

Memory Recovery and the False Memory Controversy

The false memory debate concerns the belief by some that memory recovery is a key element to the client's healing process whereas others contend that memory recovery methods may lead to the implanting of false memories. In the latter instance, these iatrogenic memories have important implications for the legal system as well as for clinical psychology as a profession. There have been numerous instances of clients suing their therapists for malpractice as a result of false memories that have arisen in therapy (Loftus, 1993).

Two factors that have been identified as possible antecedents of false memory reports arising from therapy are memory work techniques such as guided imagery (Lindsay & Read, 1994) and group influence arising from group therapy such as in the case of incest survivor groups (Marmelstein & Lynn, 1999; Polusny & Follette, 1996). The purpose of the present study is to investigate the potential effects of these two factors. However, in order to establish the importance of these factors in the production of false memory reports, it is important first to establish why mental health therapists rely on memory recovery therapy in their practice.

It should be stated that therapists engage in these practices because a client may enter into therapy with symptoms (e.g., an eating disorder) and the therapist interprets this as a symptom of sexual abuse. Because they see sexual abuse as the source of the symptomology, and addressing the underlying cause of the symptoms (i.e., the abuse) as critical to treatment success, therapists will, in many cases, operate under the assumption that the client was abused. Consequently, therapists may first inquire about abuse, and then even suggest that lack of memory for the event is no indication there was no abuse. Therapists, particularly those operating from a psychodynamic perspective, may even come to expect denial of abuse, particularly forceful denials, as even greater indication the abuse occurred and that the lack of memory surrounding the event is evidence of repression. Therefore, beliefs about repression lie at the heart of the false memory/memory recovery debate.

Repression and False Memory Research

Many studies have investigated repression, but few have clearly defined or measured repression in a consistent way. The basic premise on which repression is based is that an event is experienced, it is soon forgotten, and then recalled at a later time, sometimes many years later. A problem with this premise is that it does not differ conceptually from normal forgetting. Defining repression in a way that clearly

differentiates it from normal forgetting requires assumptions not easily tested.

To Freud (1910/1987), there was no such thing as one form of repression; instead he had several definitions, each one slightly different from the other depending on the client's particular qualities. All of Freud's theories of repression were thought of as defense mechanisms utilized by the client, though the most prominent (and also most widely supported by today's theorists) of Freud's repression theories was that of "repression proper". Briefly, "repression proper" refers to an individual consciously recognizing an event or idea that is anxiety provoking and involuntarily placing that event or idea into their unconscious. According to Freud, this forgotten material is now repressed and can be made conscious only if the anxiety that is associated with the material is removed.

As a theory, repression is problematic because ways to observe or measure it have been elusive. In order for repression to be measured we must somehow distinguish between forgotten experiences due to repression and experiences lost as a result of normal forgetting. The notion that memories may be lost and later retrieved is not unique to repression. Even as a result of normal forgetting an individual may experience an event, be unable to recall it, and then recall it clearly sometime later. For example, imagine the frustration

experienced when you enter a parking lot and have forgotten where you have parked the car. Moments later you realize that your car was parked in another lot because this lot was full when you arrived to work. Few would explain this experience as an example of repression; rather, they would characterize it as normal forgetting. Therefore, any empirical study of repression must use an operational definition that distinguishes it from normal forgetting. As we will see, researchers have typically failed in making this distinction.

The empirical studies conducted thus far that have investigated repression have tended to use operational definitions that do not distinguish it from normal forgetting. For example, Briere and Conte (1993) analyzed the responses of 450 patients who had self-reported sexual abuse in the past. They asked these patients, "During the period of time between when the first forced sexual experience happened and your eighteenth birthday was there ever a time when you could not remember the forced sexual experience?" Of the 450 subjects, 267 (59%) said "yes." The researchers interpreted this to mean that over one-half of those sexually assaulted repressed the memory of it.

Briere and Conte's characterization of an event that was temporarily forgotten and then later recalled as evidence of repression is not unique. For example,

Loftus, Polonsky, and Fullilove (1994) interviewed 105 women involved in a substance abuse treatment program to inquire about their history of sexual abuse. Each interview was conducted individually by a medical health professional and lasted approximately 1.5 hours. Participants were asked if they could recall a sexual event prior to the age of 18 with someone at least five years older than them. Overall, 54% said that they had experienced at least one item indicating childhood sexual abuse. Of those reporting memory for abuse, 69% reported a continuous memory, 12% reported remembering only part of the abuse, and 19% reported that they had forgotten for a period of time and later recalled the abuse.

As Loftus et al. (1994) described, because 19% of the sample forgot the abuse and later recalled it, one cannot conclude that they repressed the events. Not only does this evidence not differ from what can be explained by normal forgetting, but the vagueness of the question invites variability in response due to different interpretations. The women may have interpreted the question, "was there a time after the abuse when you could not remember…," in various ways because "a time" may be interpreted as only "a few moments" or as "many years." Moreover, there was no confirmation of the self-reported sexual abuse, so there is no way to estimate what percent of these memories were real or imagined.

Because repression is thought to arise as a function of particularly traumatic events such as abuse, some researchers have investigated whether instances of documented sexual abuse may have been repressed by some of the victims. Williams (1994) interviewed 129 women who, some 17 years prior, had been admitted to a city hospital emergency room for reported sexual abuse. Medical records and hospital staff documented the abuse. The purpose was to determine whether participants were willing to report the abuse. Lack of reporting the abuse was interpreted as evidence the abuse was forgotten and therefore repressed. Interviewers asked detailed questions about each participant's sexual abuse history, though they never inquired about the specific documented experience if a participant failed to report it. Of the 129 women, 38% did not report the documented abuse. Williams (1994) speculated that these accounts provided evidence of repressed memories and not simply evidence of non-disclosure. That interpretation was justified by pointing out that some who failed to report the abuse in question reported other memories of abuse.

However, there are multiple alternative explanations as to why these participants may have failed to report the abuse, and none of these explanations assume repression occurred. First, because some of this sample reported other abuse does not indicate that 38% did not recall the abuse. For a multitude of

reasons, individuals may report some instances of abuse and choose to remain silent about others. Therefore, it is impossible to tell what proportion, if any, of the non-reporters represents actual forgetting rather than nondisclosure. Second, of those who failed to report the sexual abuse, 51% had experienced the episode before the age of six, and a sizable proportion prior to the age of three. Thus, normal childhood amnesia and ordinary forgetfulness could have accounted for the 38% of non-reporting because the interviews occurred nearly two decades after the reported episodes.

Consequently, studies examining the prevalence of repression have not operationally defined repression in a way that distinguishes it from normal forgetting. Despite the questionable evidence for repression, mental health clinicians routinely attempt to recover "repressed" memories in the belief that it will benefit the client.

Prevalence of Recovered Memories

The use of memory recovery techniques to recover early memories of abuse is a common practice-one that can have important negative consequences. In an attempt to provide evidence that repressed memory reports have become commonplace, Pendergrast (1995) estimated that over one million "recovered memories" are reported each year. Because these "memories" have been retrieved in therapy, the accuracy of these memories has

come under scrutiny, as both researchers and practitioners question the veracity of these memory reports.

Recovered memories of early childhood sexual abuse typically emerge after an individual has undergone mental health therapy over a period of time. Numerous mental health therapists engage in a series of techniques believed to help recover early memories of abuse. These memory recovery techniques include hypnosis, guided-imagery, dream interpretation, and journal writing. Each of these methods will be briefly described.

Hypnosis

This method of memory recovery is based on the assumption that clients can enter into a dissociated mental state, whereupon memories that were previously irretrievable in a conscious state now become accessible (Lindsay & Read, 1994). To produce such a state, a therapist would utilize relaxation techniques combined with hypnotic suggestion that may or may not involve age regression (Spanos, 1986). In accordance with Hilgard's (1977) neodissociation hypothesis, proponents of hypnosis believe this method allows access to memories earlier dissociated from consciousness due to their traumatic nature. This approach assumes that the to-be-remembered material was never actually forgotten, it was just stored in a part of the

memory that could not be accessed without a dissociative technique.

Guided-Imagery

Similar in many ways to hypnotic procedures, guided imagery techniques require clients to relax and imagine a situation constructed, ultimately, by the therapist's opinion of how the situation should initiate and how the course of the situation should unfold. For example, the therapist may inquire about the possible sexual abuse an adult underwent as a child. The client is instructed to relax and imagine re-experiencing the abusive event, as the therapist suggests ways in which it may have occurred. Clients may then be asked questions about the situation (e.g., "Is it a face you recognize?").

Dream Interpretation

Although there is no evidence that dreams can be interpreted as accurate recollections of past events (Lindsay & Read, 1994), dream interpretation is another commonly used memory recovery technique. As the therapist acts as an interpreter of a client's dreams, the suggestiveness associated with this method is similar to hypnosis and guided-imagery such that the client is dependent on the suggestions of the therapist. Despite the suggestive nature of the procedure, many therapists conclude that the dreams clients report (subject to the therapist's interpretation of those dreams) represents the

unconscious mind communicating experiences that were repressed (Mazzoni, Loftus, and Seitz, 1998).

Journal Writing

Another common memory recovery technique, journal writing requires clients to write and read aloud possible memories of childhood sexual abuse, even if they are only the result of their imagination (Bass & Davis, 1998). This type of free-association is intended to help free the client from disclosure limitations, possibly enhancing previously unrecalled memories. Lindsay & Read (1994) argue that such practices, when combined with a stream-of-conscious style of writing, can reduce the accuracy of memory reports. While this technique may involve less suggestion than prior methods, uncritical evaluation and the rehearsal of memories (e.g., reading the passages aloud) may cause inaccurate memories to be reported.

These suggestive practices are "effective" in that exposed individuals tend to report more memories as well as memories from an earlier period (Lindsay & Read, 1994; Marmelstein & Lynn, 1999). However, if the accuracy of the memory reports is of any importance, the use of such techniques is problematic. Lindsay & Read (1994) explained that undergoing these various recovery methods can lead to iatrogenic memories (i.e., memories implanted by the therapist that are believed by the client as real, but are in fact false). Many express this latter concern.

Indeed, there are even various organizations formed by those accused of sexual abuse based on recovered memories (e.g., British False Memory Society; False Memory Syndrome Foundation), who have communicated to the public the possible dangers associated among repression, memory recovery, and iatrogenic memories.

When subjected to memory recovery practices, people can develop the belief that they experienced an event. In fact, individuals may come to therapy with no memories of abuse and quickly become convinced that the abuse occurred, thus spending considerable time during therapy "recovering" these memories (Lindsay & Read, 1994). Unfortunately, the pressure to recover memories may lead to false recollections. In order to examine this possibility, a number of studies have been conducted to demonstrate that false memories can be implanted and confidently held by participants using experimental methods. Much of the early research in false memory implantation arose in the context of hypnosis research. Because hypnosis shares many of the same characteristics present in guided imagery techniques, the literature on false memories arising from hypnotic suggestion (i.e., hypnotic pseudomemories) will be explored.

Research on Hypnotically Elicited Pseudomemories

Researchers have investigated the ways in which hypnosis might lead to false memory creation. In their seminal study,

Laurence & Perry (1983) investigated this phenomenon in 27 participants rated as being highly susceptible to hypnosis. Participants were asked, during hypnosis, to choose a night of the previous week and to describe the last 30 minutes before they went to sleep. Participants were given a hypnotic auditory suggestion informing them that they had been awakened in the middle of the night by a loud noise. After the session was concluded, participants were interviewed immediately or 7 days after the session about the suggested event. Overall, 13 of the 27 participants reported the suggested event as real. When told that the event was suggested to them during hypnosis, 7 participants recanted their earlier memory report, but 6 participants steadfastly maintained that the event actually happened. Based on these findings, Laurence & Perry (1983) concluded that 22% of participants experienced false memories as a result of the hypnotic suggestion.

With a method comparable to that of Laurence & Perry (1983), Spanos & McLean (1986) employed a similar paradigm with 33 participants rated as being highly susceptible to hypnosis. While they were hypnotized, the researcher suggested to each participant that they had been awakened the night before by a loud noise. During this hypnotic procedure, 11 participants reported to have heard the noise. Subsequent posthypnotic interviews revealed that only 9 participants maintained they

believed they truly heard the noises. The researchers then told participants that each individual possessed two independent "mental entities." The mental part that was hypnotized was portrayed as being corruptible by hypnotic suggestion, while the other part was portrayed as capable of accurately distinguishing between reality and imagination. When participants were instructed that they had access to both mental entities and that the accuracy of information they reported was important, seven participants recanted and only two maintained they had really been awakened by loud noises. Spanos concluded that task demands and the desire to present themselves as genuinely hypnotized for the hypnotic pseudomemories was a more parsimonious explanation than assuming that false memories had been created.

In an attempt to examine the resilience of pseudomemories over time, Sheehan, Statham, Graham & Jamieson (1991) tested whether false memory suggestions effectively persist after a two-week interval for individuals rated as highly or moderately susceptible to hypnosis. All participants were individually shown a videotape of a bank robbery and instructed to recall facts presented in the tape at its conclusion. Participants were assigned to either a hypnosis group (experimental) or waking group (control-no hypnosis). After all participants gave confidence ratings of their recall accuracy, the experimental

group underwent hypnotic induction and were "informed" that the robber had worn a mask and that he swore excessively during the robbery (both suggestions were false). Participants then rated the extent to which they felt they had been hypnotized. Two weeks later, participants were tested for video recall by another experimenter, and again gave their confidence rating of their recall accuracy. Highly susceptible participants in the hypnosis condition demonstrated the highest incidence of pseudomemory for both suggestions (i.e., they more frequently reported seeing the mask and hearing the swearing).

The research on hypnotic pseudomemories leads one to draw the following conclusions: (1) those highly susceptible to hypnotic suggestion are more apt to produce and maintain pseudomemories than those low in hypnotic suggestibility, (2) most participants who report pseudomemories recant if given sufficient motivation to do so, and (3) even non-hypnotized individuals will report false memories. The fact that most participants later recant their pseudomemory reports suggests that the initial reports may not reflect genuine memories, but rather, attempts to meet experimental demands. Therefore, we should be careful to distinguish between false memories and false memory reports. Furthermore, the fact that false memories may arise outside of hypnosis suggests that the implanting of false memories may not necessarily arise as a result of entering

into a dissociated state (one interpretation suggested by those who advocate for the use of hypnosis), but depend more on qualities of the individual and the context in which the false information is presented. Therefore, we turn next to the research investigating the reporting of false memories in a non-hypnotic context.

Non-hypnotic Memory Creation

When instructed to enhance one's memory using imaginative techniques, the boundaries with which the real and imagined are separated can become increasingly difficult to distinguish. That is, repeated imaginings can erode an individual's capacity to distinguish between real occurrences and imagined ones (Johnson & Raye, 1981). This process has been referred to as "imagination inflation," (Loftus, 1998). As noted previously, therapists routinely engage in a procedure known as guided imagery to facilitate the recovery of early memories. Here, therapists encourage clients to imagine, repeatedly, various scenarios surrounding the abuse in the hope that these imagined images will help trigger real memories. Researchers have investigated whether guided imagery procedures may lead to the production of false memory reports.

Over the course of three interviews, Hyman and Pentland (1996) examined the effects of guided imagery on false memory creation in 72 college students. The to-be-implanted events

were first verified to be false. The parents of each participant were mailed a questionnaire asking if their child, prior to the age of 6, had experienced an emotionally stressful event (e.g., getting lost, a car accident). Upon verification the events never occurred, participants were subjected to memory interviews designed to elicit a false memory. When unable to recall a false event, participants in the control condition were required to think quietly about the event for approximately 60 seconds, whereas those in the guided imagery condition were asked to imagine and describe mental images of the event as it would have happened. Overall, 37.5% of those in the imagery condition and 12.1% of the control reported the creation of a false memory. Moreover, participants in the imagery condition rated their memories as having greater clarity.

Because the concept of dissociation so closely resembles repression, and both are assumed to arise from traumatic experiences, Hyman and Billings (1998) tested whether imagination and dissociative experiences relate to false memory creation. They had 66 college students undergo a series of interviews designed to elicit memories of an early childhood event that never happened. The to-be-recalled events were verified to have not occurred based on interviews with each participant's parent. Over two interviews separated by a one-day interval, participants were repeatedly encouraged to recall

an early childhood event ostensibly revealed from the interview with their parents. During the experimental session, all participants were encouraged to use visualization in aiding recall. Participants then rated how confident they were that the event actually occurred. A total of 27% of the participants created either partial or complete false childhood memories, and both the Creative Imagination Scale (CIS) and Dissociative Experiences Scale (DES) were found to have a significant positive correlation with false memory creation.

Porter, Yuille, and Lehman (1999) used a similar methodology to Hyman and Billings (1998). The participants (i.e., students) were asked to recall two purportedly real events (in reality one event was real and the other was false). Over three sessions they were encouraged to recover these memories using guided imagery and repeated retrieval attempts. The researchers found that more than 88% recalled the real event and 56% recovered either a complete or a partial memory of the false event. Moreover, more than 75% of the "implanted" memories were confidently held (i.e., rated as moderate or higher).

Further evidence of the significance of guided imagery in the creation of false memory reports was provided by Paddock, Noel, Terranova, Eber, Manning, and Loftus (1999). In the first of two sessions, participants (either individually or in a group

of 8-10) were administered the Life Event Inventory (LEI) and required to rate how confident they were that each experience had occurred to them prior to age 10 (e.g., breaking a window with your hand, getting stuck in a tree). One week later, participants performed a guided-imagery task taking them through four events described by the LEI. Upon completion, participants were given the LEI again and were required to rate their confidence in each event. Guided-imagery led to a 47% increase in confidence ratings for the four selected events.

There is an ongoing controversy that memory reports from alleged abuse victims are the result of suggestive therapeutic practices. In an attempt to examine whether abuse victims are more vulnerable to memory distortion than non-victims, Clancy, McNally, Schacter, and Pitman (2000) sought to identify differences in susceptibility to false memory in sexually abused women. Participants included 15 women who reported recovered memories of childhood sexual abuse, 15 who believed they were victims of abuse but had no memory, 12 who had always remembered the abuse, and 15 non-abused controls. Participants were individually presented word lists, each consisting of semantically related items (e.g. sour, bitter, candy, sugar) that were meant to produce the false recognition of a non-presented "false target" (e.g., sweet). Participants were later given a recognition test of previously presented words and asked

to score each word as either "remembered" or "new." Though the words were not traumatic in nature, those with recovered memories of abuse were found to be more susceptible to false recognition than the remaining three groups. The implication here may not be that abuse victims are more susceptible to false memories, but that the recovered memories themselves are the result of susceptibility to suggestion.

More recently, researchers have made use of computer technology to aid in the imagery associated with false events. In conjunction with suggestive memory techniques, the actual "proof" of an experience (e.g., a photograph) is hard to refute and can aid in memory production. Wade, Garry, Read, & Lindsay (2002) recruited 20 college students who, based on verification from family members, had not partaken in a hot air balloon ride. By digitizing a photograph of each participant and a family member in a balloon ride, the false event was created and three interviews were designed to elicit a false memory of that event after presenting subjects with the digitized photograph. In the first interview, all participants were subject to guided imagery after they initially failed to recall the event. After the three interviews, 50% recalled the false event completely or had a partial memory of it, though, participants were less confident that the false event occurred than those events that were verified by family members to have actually happened.

In summary, a number of studies have demonstrated that false memory reports can be elicited in an experimental context. Moreover, guided imagery has been shown to aid in the generation of false memory reports. As noted earlier, guided imagery is a common method employed by therapists to aid in memory recovery (Lindsay & Read, 1994). In addition, memory recovery therapy is often conducted in group settings. The possible effects of group influence on memory reports will be explored next.

Group Effects on Memory

Psychotherapists may employ various methods of memory recovery techniques. Hypnosis, guided-imagery, and free association as a means of memory recovery often take place in groups (Polusny & Follete, 1996; Poole, Lindsay, Memon, & Bull, 1995). Therefore, in addition to the influences of questionable suggestive practices (e.g., guided-imagery and hypnosis) used to elicit memories of to-be-recalled events, group influence may also contribute to the formation of false memory reports by various means (e.g., social facilitation, normative social influence, or informational social influence). According to Zajonc (1965), individuals engage in social facilitation when their behavior or performance is enhanced in the presence of a group, thus they are more motivated when an audience is present. With normative social influence, conformity is the result of the individual abiding by norms, whether they are implicit or

explicit, in an attempt to escape rejection and gain acceptance by a group (Cambell & Fairey, 1989). Furthermore, individuals may modify opinions or behaviors as a result of group influence whereby the group members provide information of which the target was not aware. This is informational social influence. With this in mind, it is important to investigate the possible effects group influence may exert on individual judgments.

Some of the early studies on group effects had little to do with memory. Sherif (1936) conducted one of the first experiments documenting the power of group influence. In order to produce an ambiguous situation, the auto kinetic effect was used (i.e., the optical illusion that a pinpoint of light, when seen in a darkened room, appears to move when in fact it does not). Sherif arranged for participants to state their individual judgments for the distance the light moved. Alone, participants reported varying lengths. However, when prompted to state their judgments aloud in a group, their opinions converged to a group norm.

Asch (1955) examined the effects of group influence on participants who were supposedly confident in their attitudes, opinions, and judgments concerning a performed task. After assembling seven-man groups, Asch presented each group with a line-judging task (e.g., choosing one of three lines that matched a previously presented target line). Each member of the

group then said aloud which line they believed to be the correct match. In reality, the other group members were confederates trained to give incorrect responses. Each participant was in the sixth position and heard five other group members give the wrong answer before they responded. Because of the ease of the perceptual task, conformity was measured by the percent of errors made. Without confederates present, participants only made errors .08% of the time. In the group setting, the average conformity rate was 36.8%, with 75% making at least one error.

In an attempt to measure the effect of group size on conformity, Asch (1955) varied the number of confederates in each group from 2,3,4,8, and 16 persons, respectively. His findings suggested that increasing the number of confederates increased the conformity rate, but only up to a point. When faced with one confederate, participants conformed on only 3.6% of the trials. Two confederates increased this error rate to 13.6%. When the majority consisted of three confederates, error rates rose to 31.8%. The addition of more confederates marginally increased conformity, though no error rates were appreciably raised above the 31.8% achieved by three confederates. Asch (1955) concluded that the ease of the perceptual task did not result in failure to conform. Instead group size and individual differences in the participants had the greatest impact on conformity.

In accordance with these early findings, the meta-analysis of Tanford and Penrod (1984) show that target influence is mainly a non-linear function of majority size. When an individual is faced with opposing opinions, each influence source significantly increases conformity up to a point (i.e., two influences are greater than one; three influences are greater than two). In further support of Asch's (1955) findings, the addition of more influences does not significantly increase conformity above what was achieved with three sources.

Turning specifically to the effects of group influence on memory tasks, Schneider and Watkins (1996) illustrated in two experiments how group influence affects memory recognition. In experiment one, 32 college students were tested in pairs on their recognition of a list of words. Each pair was misled into believing that they were studying identical word lists. At the prompting of the experimenter, each subject took turns saying aloud whether they remembered the word from the previous list. The authors found that second responses conformed greatly to first responses. Overall, 59% of words accepted by the first participant were accepted by the second (even though they were incorrect), whereas the second participant accepted only 36% of the words if rejected by the first (even though they would have been correct). As hypothesized, participants who responded second reported remembering more of the words if the first

participant remembered them also, even though they had not actually studied the same word list.

Experiment two consisted of 24 different students. The procedure was similar to experiment one, though a confederate and a participant completed each "pair," and a 6-point confidence rating was required at the recording of each answer. Comparable to experiment one, acceptance of the word by the subject was higher (e.g., 65%) if the confederate accepted the word first (i.e., "recognized" the word from a previous list), and lower (44%) if rejected. The confidence rating of the subject was also shown to be a significant function of the confederate's prior rating (i.e., the higher the confederate's confidence, the higher reported confidence of the participant).

In an attempt to investigate the interaction of imagery and group influence on memory reports, Hoffman, Granhag, See, and Loftus (2001) studied how reality monitoring decisions are influenced by the credibility of the information source. In the first of two sessions, 46 college students were individually shown a slide show consisting of 12 objects (e.g., birds, fruits, etc.) and were asked to imagine 12 similar objects. After a 48 hour interval, participants were administered a reality-monitoring test including the 24 real and imagined items as well as 48 new items. They were then instructed to identify each item as "perceived," "imagined," or "new," followed by a

confidence rating. Furthermore, participants were shown a confederate's response for each item and, depending on their condition, were instructed that it was from a prior subject (high-credibility) or was an answer randomly generated from a computer (low-credibility). When the highly credible confederate answered incorrectly, participant's accuracy dropped from 62% to 42%, whereas when the incorrect answer came from a low credibility source, the accuracy remained the same. Participants in the high-credibility group also showed greater confidence than the low-credibility group, even though they were often incorrect. As hypothesized, these findings speak to the impact of group influence as an effective manipulator of memory.

In an attempt to better simulate the context of group therapy sessions, Marmelstein & Lynn (1999) examined the effects of group influence, expectancy information, and imagery on reports of early autobiographical events. Individually or in groups of three to six, participants attempted to recall their earliest memory. Participants were also divided into high and low expectancy groups, (i.e., high expectancy groups were told that they could remember back to the first year of life; low expectancy groups were given no age specific information). After recall trials and reports of their earliest memory, all participants were then hypnotized and asked to retrieve even earlier memories than previously reported. After the hypnotic

induction, nearly two-thirds of participants reported memories prior to the age of two, yet no effects were found for expectancy information or group influence. The authors noted that the null findings with respect to group influence could have been due to the lack of confederate involvement. The other group members consisted of other participants-some of which were able to recall earlier memories and some were not. Consequently, the level of group influence was not uniform across group conditions.

Research thus far, however, has not adequately investigated how the combination of guided imagery and group influence interact to produce false memory reports. That is, both guided imagery and group influence may impact early memory reports, and both factors are often present in memory recovery practice. Consequently, the present study investigated early memory reports for a false event arising from guided imagery, group influence, or a combination of the two factors. Identifying how these factors influence participant reports can help researchers (and clinicians) learn more about the fallibility of memory recovery techniques, particularly when arising in group settings.

Hypotheses

In the present study, it was hypothesized that both guided imagery and group influence would increase the likelihood of

false memory reports, however, these two factors would interact so that false memory reports would be most likely when they occurred in combination.

A second hypothesis was that both guided imagery and group would increase the amount of elaboration in participants' memory reports, however, these two factors would interact so that elaboration would be most increased when they occurred in combination.

A third hypothesis was that there would be a main effect of guided imagery and a main effect of group for the participant's confidence that the memory happened exactly as they reported it. It was further hypothesized that there would also be an interaction of guided imagery and group influence.

A fourth hypothesis was that there would be a main effect of guided imagery for how clear one rated their recollection of the event (i.e. clarity).

A fifth hypothesis was that there would be a main effect of group influence for the perceived amount of pressure participants felt to report a memory.

The sixth hypothesis was that there would be a main effect of group influence for the level of certainty by which participants felt the event actually happened.

METHOD

Participants

Participants were recruited from introductory psychology classes at the University of North Carolina Wilmington. A total of 29 Males (M = 18.9, SD = 0.95) and 70 females (M = 19.3, SD = 2.8) participated. All participants received credit toward their respective psychology classes.

Materials

Two scales were used to measure individual characteristics relevant to false memory creation. The Creative Imagination Scale (CIS; Wilson and Barber, 1978) is a measure that combines the participant's ability to create a vivid mental image and to respond to the experimenter's suggestions. The scale, which can be administered both to individuals and groups, consists of ten different items that range from auditory and kinesthetic suggestions (e.g., re-experiencing "hearing" music; imagining the numbness of fingers) to forms of time distortion (e.g., age regression). After each detailed suggestion, participants rated the similarity between the suggested sensation and the actual experience on a 0-4 point scale. The instrument has satisfactory test-retest reliability, (r=.82), as well as split-half reliability, (r=.89), (Wilson & Barber, 1978).

The Gudjonnson Compliance Scale (GCS) is a 20-item, true-false scale that measures the degree to which a participant would comply with a request or obey an instruction that they

deem as incorrect or of no benefit to them (Gudjonnson, 1989). This self-report measure yields an overall score from 0 to 20 (the more true statements, the higher the compliance rating). The scale consists of two main factors. The first factor is designed to relate to the difficulties the participant has in coping with pressure. For example, participants are asked: 1) I give in easily to people when I'm pressured, or 2) I tend to give in to people who insist that they are right. Factor two reflects their eagerness to please through the fulfillment of others' expectations. For example, participants are asked: 1) I try to please others, or 2) I try hard to do what is expected of me. Gudjonsson (1989) reports an alpha coefficient of .71 for the 20 items and a test retest reliability of r=.88. Richardson & Kelly (2004) found scores on the GCS correlated (r=.39) with evidence of compliant behavior in a sample of incarcerated juveniles.

Immediately upon the completion of a memory recovery session (See Memory Recovery Procedure), participants were given a questionnaire asking them to make a series of judgments concerning their memory for the suggested event. During the memory recovery session, the experimenter wrote down, verbatim, participants' responses. Blind raters then categorized these responses (e.g., Yes/No) to determine if (1) a memory report was present and (2) if there was an elaboration of the memory.

Elaboration was defined as anything that is reported by participants that exceeds the information given to them by the experimenter. A questionnaire following the memory recovery session had the participants rate the following: (3) To test their confidence in their memory, participants were asked to rate how confident they are that the event happened as they remembered it on a 6-point Likert scale ranging from 1 (very confident no memory for event) to 6 (very confident memory for event); (4) To test the clarity of their memory, participants were asked to rate how clear their memory is on a 6-point Likert scale ranging from 1 (not at all clear) to 6 (extremely clear); (5) To test the certainty of the event, participants were asked to rate, regardless of their memory for the procedure, how certain they are that the event occurred. Certainty for the event was rated on a 6-point Likert scale ranging from 1 (not at all certain) to 6 (extremely certain); and (6) Participants were asked to rate the extent that they felt pressured to report a memory. Reporting pressure was rated on a 6-point Likert scale ranging from 1 (not at all pressured) to 6 (extremely pressured). These variables served as dependent measures from which each participant's memory report was examined (See Appendix 2 for full questionnaire).

Design and Procedure

A 2(guided-imagery/no guided-imagery) X 2(group/no group) between subjects factorial design was used. Participants were randomly assigned to one of the four conditions where each was administered a memory recovery procedure. The order of presentation of the CIS/GCS and the memory recovery procedure (MR) was counterbalanced (i.e., CIS/GCS/MR; CIS/MR/GCS; GCS/MR/CIS; GCS/CIS/MR; MR/CIS/GCS; MR/GCS/CIS).

Memory Recovery Procedure

In order to experimentally elicit false memory reports, the experimenter informed participants that, at a very early age, they probably experienced a medical procedure that was routine at the time. Participants were told that the procedure, known as an IVU (intravenous urogram), involves the insertion of a urinary catheter for the purpose of injecting a dye into the bladder, and subsequently using an X-ray to discover a disorder known as vesicoureteral reflux (VUR). This disorder occurs when urine in the bladder backs up into the kidneys and causes infections and kidney damage. Although both the disorder and testing procedure are real, they are considered rare in the overall population. Past studies have estimated at the prevalence of VUR somewhere between 0.4-2.0% (Sargent, 2000).

This event was chosen for numerous reasons. First, the nature of the event is judged to be fairly traumatic by young

children, though socially sanctioned (i.e., perceived as necessary for proper health standards) by adults (Ceci & Loftus, 1994). In the past, researchers have typically relied on events that are vivid and considered to be highly emotional to a young child. Therefore, in previous studies researchers have relied on events such as spilling the punchbowl on a bride at a wedding (Hyman & Billings, 1998), and experiencing a serious animal attack or getting lost in a mall (Porter et al., 1999). For reasons of consistency with past studies and generalizability to other traumatic experiences (e.g., abuse), this event was chosen for the false memory.

Moreover, in order to increase the likelihood that the event is reported as real by participants, it was important to choose a memory event that: 1) appears plausible, and 2) could be known by the researchers. In past studies, events such as being lost in a mall and spilling a punch bowl were ostensibly chosen from interviewing parents of the participants (i.e., participants were led to believe that their parents supplied the details on these early experience). To avoid the necessity of interviewing parents, the present study used a medical procedure that participants were told was once routine. By suggesting that the procedure was once a routine medical procedure for young children, just as inoculations are routine today, a plausible reason for suggesting the event probably occurred was

established. Furthermore, because it was suggested that the procedure was once typical, a plausible reason why the experimenter would know they experienced it was established.

Finally, although the procedure is real, it is also quite rare (Sargent, 2000). Moreover, it was suggested that it occurred at an age that coincides with infantile amnesia (prior to age 3), so any memories, even of real events from that period, are rare (Usher & Neisser, 1993). The rarity of the procedure, combined with the rarity of any memories recalled from this period, imply that any reports by participants that they can recall the event has a high probability of being a false memory report.

In the memory recovery session, all participants were told that they were taking part in a study examining the clarity of childhood memories. Before the recovery session, all participants were initially asked if they could remember the event.

Half the participants were randomly assigned to either a group recovery or an individual recovery session. In the group recovery session, participants were tested after witnessing the same procedure take place with three confederates. All three confederates initially reported that they could not recall the event and then later were able to recall specific aspects of

the medical procedure. Each confederate was able to recall different details.

Half the participants were either given guided imagery instructions and then asked to recall the event (guided imagery: GI), or simply asked to recall the event (no guided imagery: NGI) after silent reflection of the event for one minute (see Appendix 1). For participants in the guided imagery condition, images surrounding the event were identified (e.g., the bright lights in the room, the yellow cold disinfectant, the blue dye in the catheter tube) and participants were asked to focus on these images as they tried to recall more information surrounding the event. For those in the NGI condition, they were asked to "try hard" and "focus" as they were encouraged to recall the event. Following the memory recovery procedure, participants were asked to answer a series of questions surrounding their memory experience (Appendix 2).

All participants were debriefed at the end of the semester. It is believed that delayed debriefing was necessary because this particular study was vivid, memorable, and easily explained to other participants in a way that word-of-mouth could have easily jeopardized the findings.

RESULTS

Recall that it was hypothesized that group influence and guided imagery would interact for memory reports. A loglinear

analysis was conducted on group (yes/no), guided imagery (yes/no) and memory report (yes/no). The result indicated that the two-way interactions of group by memory and guided imagery by memory adequately fit the data, $X^2(2, N= 99)= 5.94$,n.s. A Chi-square test of independence was conducted to assess the relation between group influence and memory reports. The results revealed a significant association between the two factors, χ^2 $(1, N=99) = 7.72$, $p < .01$, $\phi = .28$. In the no-group condition, only 29% reported a memory, whereas 57% reported a memory in the group condition. A chi-square test of independence was conducted to assess the relation between guided imagery and memory reports. The results revealed a significant association between the two factors, χ^2 $(1, N=99) = 14.17$, $p < .01$, $\phi = .38$. In the no-guided imagery condition, only 24% reported a memory, whereas 62.0% reported a memory in the guided imagery condition. Table 1 reports the counts and percentages for memories reported and elaborated upon across the four conditions.

Table 1. Counts and Percentages for Memory Reports And Elaboration Across All Four Conditions

Condition	Memory Report		Elaboration	
	Count	%	Count	%
No Gr / No GI	1	4.5%	1	4.5%
No Gr / GI	13	50.0%	13	50.0%
Gr / No GI	11	40.7%	11	40.7%
Gr / GI	18	75.0%	18	75.0%

Looking only at subjects who received guided imagery, a point-biserial correlation was conducted to determine the relation between memory report (yes/no) and CIS scores. The results revealed no significant relation between these variables, $r = -.061$, $p > .05$.

Looking at all subjects, a point-biserial correlation was conducted to determine the relation between memory reports (yes/no) and GCS scores. The results indicated that the relation between the two variables was significant, $r = .22$, $p < .05$.

Recall, it was hypothesized that both guided imagery and group influence would interact on elaboration reports. A loglinear analysis was conducted on group (yes/no), guided imagery (yes/no), and elaboration (yes/no). Because all memory reports also contained elaboration, the findings mirrored those for memory reports as only the two way interactions of group by elaboration and guided imagery by elaboration were needed to adequately fit the data, $X^2(2, N = 99) = 5.94$, n.s. A chi-square test of independence was conducted to assess the relation between group influence and elaboration. The results revealed a significant association between the two factors, χ^2 (1, N=99) = 7.72, $p < .01$, $\phi = .28$. In the no-group condition, only 29.2% elaborated, whereas 56.9% elaborated in the group condition. A chi-square test of independence was conducted to assess the

relation between guided imagery and elaboration. The results revealed a significant association between the two factors, χ^2 (1, N=99) = 14.17, $p < .01$, $\phi = .38$. In the no-guided imagery condition, only 24.5% elaborated, whereas 62% elaborated a memory in the guided imagery condition. Both counts and percentages for elaboration across the four conditions are reported in Table 1.

Recall that is was hypothesized that both guided imagery and group influence would significantly interact in their effect on confidence ratings. For only those subjects reporting a memory, a 2 (group vs. no group) X 2 (guided imagery vs. no guided imagery) between subjects factorial ANOVA was conducted on subjects' confidence ratings. The results revealed a main effect for group such that participants in the group condition (M = 3.52, SD = 1.02) reported significantly higher confidence ratings than the no group condition (M = 2.57, SD = 1.09), F(1, 39) = 5.068, $p < .05$. There was no significant main effect for guided imagery, F (1, 39) = 0.00, $p > .05$, nor was there a significant group by guided imagery interaction, F (1, 39) = 1.19, $p > .05$.

However, reducing the sample to only those who reported a memory for the event produced a dramatic reduction in power. Therefore, confidence ratings were examined for all participants regardless of whether they reported a memory. A 2 (group vs. no

group) X 2 (guided imagery vs. no guided imagery) between subjects factorial ANOVA revealed a significant main effect for group such that those in the group condition ($M = 2.5$, $SD = 1.5$) reported higher confidence ratings than those in the no group condition ($M = 1.6$, $SD = 1.0$), $F(1, 95) = 11.7$, $p < .05$. Results also revealed a significant main effect for guided imagery such that those in the guided imagery condition ($M = 2.3$, $SD = 1.3$) reported higher confidence ratings than those in the no guided imagery condition ($M = 1.8$, $SD = 1.4$), $F(1, 95) = 6.83$, $p < .05$. There was no significant group by guided imagery interaction, $F(1, 95) = .149$, $p > .05$.

Recall that a significant correlation was found between GCS scores and memory reports. Consequently, a 2 (group vs. no group) X 2 (guided imagery vs. no guided imagery) between subjects factorial ANCOVA was conducted on confidence ratings using GCS scores as a covariate. The results were similar to those of the previous analysis in that there was a main effect of group such that those in the group condition ($M = 2.5$, $SD = 1.5$) reported higher confidence ratings than those in the no group condition ($M = 1.6$, 1.0), $F(1, 94) = 13.4$, $p < .05$. However, results revealed no significant effect of guided imagery, $F(1, 94) = 2.7$, $p > .05$, and no significant group by guided imagery interaction, $F(1, 94) = .44$, $p > .05$.

Recall that it was hypothesized that there would be a main effect of guided imagery for how clear one rated their recollection of the event (i.e., clarity). Looking at only those subjects reporting a memory, a 2 (group vs. no group) X 2 (guided imagery vs. no guided imagery) between subjects factorial ANOVA revealed no main effect for guided imagery, F (1, 39) = .00, p > .05, no main effect for group, F (1, 39) = 1.02, p > .05, nor a group by guided imagery interaction, F (1, 39) = .632, p > .05, for how clear participants rated their recollection of the event.

However, reducing the sample to only those who reported a memory for the event produced a dramatic reduction in power compared to when examining clarity ratings for all participants, regardless of whether they reported a memory. A 2 (group vs. no group) X 2 (guided imagery vs. no guided imagery) between subjects factorial ANOVA revealed a significant main effect for group such that those in the group condition (M = 2.1, SD = 1.5) reported higher confidence ratings than those in the no group condition (M = 1.6, SD = 1.0), F (1, 95) = 4.2, p < .05. Results revealed no significant effect of guided imagery, F (1, 95) = 3.6, p > .05, and no significant group by guided imagery interaction, F (1, 95) = .21, p > .05.

Recall that it was hypothesized that there would be a main effect of group influence for the level of certainty by which

the participants felt the events actually happened. Looking at all subjects, a 2 (group vs. no group) X 2 (guided imagery vs. no guided imagery) between subjects factorial ANOVA revealed a main effect for group such that group conditions (M = 2.41 SD = 1.58) reported significantly higher certainty ratings than in no group conditions (M = 1.71, SD = 1.13), F (1, 95) = 6.35, p < .05. No main effect for guided imagery, F (1, 95) = .055, p > .05, nor a group by guided imagery interaction was found, F (1, 95), = .129, p > .05.

It was further hypothesized that there would be a main effect of group influence for the perceived amount of pressure felt to report a memory. Looking at all participants, a 2 (group vs. no group) x 2 (guided vs. no guided) between subjects factorial ANOVA was conducted on pressure ratings. The results revealed a main effect for group on pressure ratings, F (1, 95) = 6.78, p < .05. Here it was revealed that those in the group condition (M = 3.20; SD = 1.64) reported significantly greater pressure than those in the no group condition (M = 2.46; SD = 1.20). There was no significant main effect for guided imagery, F (1, 95) = .84, p >.05, nor was there a significant group by guided imagery interaction, F (1, 95) = .70, p > .05.

DISCUSSION

Consistent with past research that independently demonstrated the possible harmful affects of group therapy and

guided imagery, the present study found that both guided imagery and group influence significantly impacted false memory reports. Moreover, participants exposed to both guided imagery and group influence showed a very high likelihood of reporting a false event (i.e., 75%). Stated in terms of odds ratios, participants receiving both guided imagery and group influence were nearly 17 times more likely to report a memory than participants who were not exposed to either of these factors. These findings speak to the powerful mixture of guided imagery and group influence.

The present study showed strong evidence for the harmful effects of guided imagery in eliciting false memory reports. Recall that 62% of the participants exposed to guided imagery reported a false memory. Past studies that utilized similar paradigms (Hyman & Pentland, 1996; Hyman & Billings, 1998; Porter, Yuille, & Lehman, 1999), which examined only the effects of guided imagery, found much more modest effects on memory reports. This could be the result of several factors.

The studies of Hyman & Pentland (1996), Hyman & Billings (1998), and Porter et al. (1999) produced false memory reports of 37.5%, 25%, & 56%, respectively. Even though these studies also contained multiple recovery sessions and, arguably, more plausible false memories (e.g., spilling punch at a wedding, being bitten by a dog), their rate of reporting is still lower than that of the present study where 62% of the participants in

the guided imagery group reported a memory. It is noteworthy that this number is inflated by the fact that half of the participants in the guided imagery conditions reported a memory in a group setting. When we examine just those participants who received guided imagery in the individual sessions, we see a much more modest effect for guided imagery as only 50% of these participants reported a false memory. However, this number still compares favorably to a number of studies that found lower false memory rates.

One explanation for the greater evidence of guided imagery in the present study is that we may have used a more plausible rationale for the event than has been used in past studies. Recall that a common method used in past studies was to inform participants that the experimenters learned of the event (e.g., serious dog bite) by interviewing their parents. Participants may have found this cover story suspicious because they never recalled their parents ever mentioning this event. However, in the present study, the event (a medical procedure) was depicted as common at one time and conducted at an age children would be unlikely to recall the event. Participants were reminded that each of them had probably been inoculated when they were very young as well, and they could not recall that procedure either. By using childhood immunizations as an analogy, the cover story in the present study may have made participants less suspicious

and more inclined to believe the event (i.e., VUR) really occurred.

The generalizability of any study conducted in the lab merits analysis, and the present study is no exception. The guided imagery in the present study differs in some important respects to the use of guided imagery in actual clinical settings. For example, participants in the present study exhibited no symptoms and relayed no suspicions about a memory or event that might lead an actual therapist to begin treatment with guided imagery. Although it must be noted that there are numerous instances of therapists engaging in techniques of this sort even in the face of clients steadfastly refusing that they were abused (Loftus & Ketchum, 1994). Nevertheless, clients presumably enter therapy hoping the therapist can assist them with their problems, and thus they are motivated to do whatever the therapist suggests will help. In the present study, participants probably had little motivation to recall the memory, other than complying with experimental demands and complying with social influence pressures present in the group setting.

Time was severely truncated in the present study, relative to actual psychotherapy. That is, participants in the present study were introduced to the scenario, given reasons why the scenario was plausible, and administered the guided imagery

procedure within the first hour of meeting the experimenter. It is extremely doubtful that such an express route does, or should, exist in actual therapy.

Again differing from a clinical setting, some participants in the present study were subject to guided imagery instructions containing a scenario that was shared across all participants in the room (i.e., half of the guided imagery participants were in the group condition, thus, sharing the suggested scenario with three confederates). That is, the suggested event was not individually-specific. One may propose that, in a clinical setting, individually-specific scenarios would seem more plausible to patients. That is, a patient recognizes the uniqueness of their experience, and the low likelihood that all present in the group experienced exactly the same things.

Finally, the costs associated with reporting a memory of sexual abuse are much greater than the costs of reporting an early medical procedure. Thus, given the lack of consequences for false reporting in the experimental setting, there are reasons to assume that memory reports would be more prevalent than would occur in a real therapy session.

However, there are reasons to believe that the effects of guided imagery in actual clinical settings might be stronger than the effects created in the laboratory. The therapist is likely a trusted source who has established, over the course of

many meetings, a level of trust with the client that is not possible with a one-session interaction with the experimenter in the laboratory setting. One would expect that clients in a therapeutic setting would be more motivated to recall not only because they feel it will help their treatment, but because they seek to please the therapist with whom a bond has been established. This level of motivation is probably unlikely in the laboratory setting.

Moreover, the guided imagery procedures in therapy likely go on for much longer a period of time, and occur over numerous sessions compared to the one-session brief introduction of guided imagery in the laboratory setting. As studies have consistently shown, repeated imaginings about events tend to erode an individual's capacity to distinguish reality from fantasy (Johnson & Raye, 1981). Consequently, it is difficult to determine the degree to which the present findings would generalize to a clinical setting, however, there are a number of reasons to believe that the effects of guided imagery might actually be stronger in a clinical setting than was observed in the present study.

The present study demonstrated a significant effect for group influence in the production of false memory reports. Recall that Marmelstein and Lynn (1999) found no significant differences in their participants' tendency to report a memory

when subjected to group versus individual sessions. The Marmelstein and Lynn study and the present study differ, however, in their means of producing group influence. However, in the Marmelstein and Lynn study, groups were composed of other participants in the study, rather than using confederates to play the role of participants as was done in the present study. Consequently, the group influence in the Marmelstein and Lynn study would presumably vary from session to session as the number of group members varied, as well as the number of participants reporting a false memory varied. This was not the case in the present study where the use of confederates allowed for a uniform degree of group influence across participants. It is possible that, for some participants in the Marmelstein and Lynn study, reporting was negatively influenced by group members. That is, the presence of other participants failing to report a memory actually hindered memory reports. Consequently, it is not surprising that group influence failed to elicit increased reporting in the Marmelstein and Lynn study. Although there is an abundance of this type of control in other literature (Asch, 1955; Tanford, & Penrod, 1984), the consistent manner with which it was manipulated in the present study involving memory recovery and false memory reports is unique.

The importance of understanding the impact of group influence, as well as guided imagery, is all-the-more relevant

given the frequency with which they co-occur. Studies investigating the prevalence of guided imagery (e.g., Poole et al., 1995), as well as those studies stressing the necessity of guided imagery and group therapy as a means of treatment (Herman and Schatzow, 1987; Courtois, 1992), suggest these methods are not only common, but are expected to co-occur during a normal treatment phase. Introducing guided imagery techniques to recover "lost" memories of abuse, and doing so in a group setting, may be creating an environment conducive to false memory reports.

One implication from the present study is that plausibility may be an important factor in accounting for false memory reports. As was previously shown in Table 1, group and guided imagery, even when administered separately, elicited memory reports from 41% and 50% of participants, respectively. When utilized in the same condition, however, participants reported the event 75% of the time. Although shown to be a much larger percentage than that reported by past studies, the increased plausibility of the event may have also played some role. It was possible that the cover story used in the present study (i.e., early medical procedure) may have led to increased reporting. However, the combination of both a procedure that participants are told will help recover memories (i.e., guided imagery) and exposure to others (i.e., group influence) who believe the event

occurred led to a stronger conviction that the to-be-recalled event actually occurred.

The notion that plausibility of the to-be-recalled event is important is not unique to this study. Weekes, Lynn, and Myers (1995) found that hypnotic pseudomemories were much more likely to be elicited when the event in question was plausible (e.g., a door slammed in the hallway outside the classroom) than when the event in question was less plausible (e.g., a phone rang in the classroom). It is noteworthy that this study took place long before cellular phones were commonplace, and so a phone ringing in a classroom was still a rare event. This suggests that individuals may be much more likely to report memories for events that seem likely to have occurred, than events judged to be rare or unlikely.

This interpretation is also consistent with Orne's (1988) contention that memory retrieval techniques such as hypnosis (or in the present case—guided imagery) serve to lower participant's criteria for reporting so that events participants are less certain occurred are more likely to be reported. It may also be that events that are more likely to have occurred may also lower criteria for reporting as participants may be more willing to report a memory for an event they believe to have likely happened.

For the present study, participants were asked to rate the certainty that the event occurred. Although participants in all four groups rated certainty to be fairly low (i.e., 2 on a 6 pt. scale), participants were most certain in a group setting and the highest certainty scores appeared in the group and guided imagery condition. Thus, we do see evidence that when these factors are present, participants may see the possibility that the event occurred as more plausible. Consistent with Orne's hypothesis, the environment is also conducive to a participant's willingness to lower their criterion for reporting a memory, despite dramatic changes in their belief about whether the event really occurred or not.

In an actual therapy session involving recovered memory techniques, clients may be encouraged to report memories for events they are uncertain about. The pressure to lower one's criterion for reporting the event is substantial. Throughout the incest-survivor literature, individuals are encouraged to trust their memory (Lindsay & Read). In perhaps the most widely read of these books, *The Courage to Heal*, readers are coached that many memories start off as only "tiny little feelings" that eventually reveal themselves, but only if clients are willing to continue to work to recover these images.

The present study had a number of features that likely aided the external validity of the findings. For example, unlike

a great deal of the literature on false memories, this study involved a memory for and event which is both vivid and highly emotional. In the past, researchers have been critical of the false memory literature for not using traumatic events in the false memory research (Herman & Harvey, 1993; Wylie, 1993). Although it is not suggested here that the to-be-recalled memory in the present study is as traumatizing as actual childhood sexual abuse, it does at least contain some similarities such as the exposure of genitals, and physical sensations that are both unusual, embarrassing, and painful (e.g., insertion of a catheter and the subsequent stretching of the bladder). Consequently, the present study involved a to-be-recalled event that shared many important characteristics (e.g., sensations, embarrassment) associated with childhood sexual abuse—characteristics that were not present in much of the previous research in this area.

Recall that the Creative Imagination Scale (CIS) did not correlate with memory reports in the guided imagery conditions. One would have expected CIS scores to positively correlate with memory reports from those participants in the guided imagery conditions, as the ability to imagine events should relate to the ability to form vivid images as a result of guided imagery techniques. Yet, participants did not report significantly greater clarity when they underwent guided imagery procedures

than when they did not. Furthermore, although guided imagery was found to relate to memory reports, CIS scores failed to correlate with memory reports. This finding may shed some light on how guided imagery serves to impact memory reports. It may not be the case that guided imagery leads to more vivid visual images, which leads to a greater tendency for participants to confuse reality from imagination. Instead, a more parsimonious explanation is that participants may be merely complying with the request for the memory report, and the guided imagery procedure provides a reasonable justification for recalling an event that only moments before the participants were unable to recall. The task itself produces a demand to perform well and subjects were told guided imagery is supposed to help. Therefore, subjects may try to report as much as possible, regardless of how well they remember, or are able to visualize the images.

This demand characteristics interpretation (Orne, 1962) suggests that any procedure, regardless of its effectiveness, should produce increases in reporting if participants are given the opportunity to maintain their image as an honest reporter. Essentially, guided imagery procedures may have provided participants with a rationale why their initial inability to recall the event would be overcome and they could now report the memory with clarity. This finding has been well documented in

the hypnosis literature where participants are given reasons why they should be able to perform acts they could not normally perform (i.e., special process theories, Spanos, 1986). Without the rationale that guided imagery should help them recall, it may have been difficult for participants to justify why they could not recall the event only moments earlier, and now could recall the event easily. This hypothesis implies that participants are not led to privately believe the event occurred. Rather, participants are motivated to publicly report the memory, and guided imagery procedures provide a reasonable justification for doing so in a manner that protects their self image.

Another interpretation is that participants really do believe the event occurred and they are trying to produce a memory consistent with what they believe truly happened. This interpretation suggests memory reports are the result of confabulations, as participants attempt to "fill in gaps" between what they can recall, and what they assume must have occurred. Just as one may not have a recollection of putting the key in the ignition when they drove home the previous evening, they make the correct assumption that they must have engaged in this act, and are willing to report a memory consistent with a behavior they regard as likely. According to this explanation, guided imagery enhanced the plausibility of

the scenario, eliciting a higher percentage of memory reports. That is, the process of simply imagining how an event might have taken place actually led to an increased belief that the event probably occurred. This interpretation is consistent with the decision making literature which has shown that imagining an event makes it seem more plausible (Connoly, Arkes, & Hammond, 2000). However, guided imagery was unrelated to beliefs in the certainty of the event ($r = .01$). That is, plausibility (as measured by certainty) was most closely tied to the group setting, than it was to the presence of the guided imagery.

Another hypothesis is that guided imagery interferes with the ability for individuals to distinguish between reality and imagination. Loftus refers to this tendency as imagination inflation, and this finding has been found repeatedly over a variety of studies (e.g., see Johnson and Raye, 1981). Recall, however, that no main effect of guided imagery was revealed for clarity ratings. That is, participants reported that they had no clearer an image of the suggested event when they received guided imagery instructions than when they did not. One would predict that if imagining an event makes is seem more real and leads to greater difficulty in distinguishing reality from imagination, then we would see evidence of higher clarity ratings in response to the guided imagery instructions.

While it must be noted that the guided imagery was only one procedure (rather than repeated cases of guided imagery – something common to the imagination inflation literature as well as common to actual memory recovery methods), the lack of a significant relation between guided imagery and clarity ratings is evidence in favor of a demand characteristics interpretation. That is, participants are not reporting more false memories because they get confused about what is real and what is only imagined, but rather, they are motivated to report the memory, and the guided imagery procedure provides a ready excuse for why their memory report should change (they had initially reported the suggested event did not occur).

Certainly, no one claims that all traumatic memories recovered in therapy are false, however, thousands of personal accounts and empirical evidence conclude that not all memory reports are necessarily true. The present study provides further evidence to suggest that recovered memory therapy is a dangerous method if the veracity of the memories or of any concern. Because the truth of what is reported is always a concern, methods such as guided imagery are problematic when used in a recovered memory context, and they are all-the more troubling when these methods occur in group therapy.

REFERENCES

Asch, S.E. (1951). Effects of group pressure upon the modification and distortion of judgments. In H. Guetzkow (Ed.), *Groups, leadership, and men*. Pittsburg, PA: Carnegie Press.

Bass, E. & Davis L. (1992). The Courage to Heal: A guide for women survivors of child sexual abuse. New York: Harper Collins.

Briere, J. & Conte, J. (1993). Self-reported amnesia for abuse in adults molested as children. *Journal of Traumatic Stress* 6: 21-31.

Cambell, J.D., & Fairey, P.J. (1989). Informational and normative routes to conformity: The effect of faction size as a function of norms. *Journal of Personality and Social Psychology, 57,* 457-468.

Ceci, S. J., Loftus, E. F. (1994). Memory work: A royal road to false memories? *Applied Cognitive Psychology, 8(4),* 351-364.

Clancy, S., McNally, R.J., & Schacter, D.L. (1999). Effects of guided imagery on memory distortion in women reporting recovered memories of childhood sexual abuse. *Journal of Traumatic Stress, 12(4),* 559-569.

Connolly, T., Arkes, H.R., & Hammond, K.R. (2000). *Judgment and decision making: An interdisciplinary reader* (2nd ed.). New York, NY: Cambridge Press.

Courtois, C. A. (1992). The memory retrieval process in incest survivor therapy. *Journal of Child Sexual Abuse*, 1, 15-31.

Freud, S. (1987). The origin and development of psychoanalysis: First and second lectures. In, *American Journal of Psychology, 100, (3-4),* 472-488. (Original Lecture at Clark University, 1910)

Gudjonnson, G. (1989). Compliance in an interrogative situation: A new scale. *Personality and Individual Differences, 10(5)*, 535-540.

Herman, J. L., & Harvey, M. R. (1993, April). The false memory debate: Social science or social backlash? *The Harvard Mental Health Letter*, 4-6.

Herman, J., & Shatzow, E. (1987). Recovery and verification of memories of childhood sexual trauma. *Psychoanalytic Psychology*, 4, 518-537.

Hilgard, E. (1977). Controversies over conciousness and the rise of cognitive psychology. *Australian Psychologist, 12(1),* 7-26.

Hoffman, H., Granhag, P., See, S., and Loftus, E. (2001). Social influences on reality-monitoring decisions. *Memory and Cognition, 29(3)*, 394-404.

Holmes, D. (1990). The evidence for repression: an Examination of sixty years of research. In R. Baker (Ed.), *Child sexual abuse and false memory syndrome*. Amherst, NY: Prometheus Books.

Hyman, I., & Billings, F. (1998). Individual differences and the creation of false childhood memories. *Memory, 6(1)*, 1-20.

Hyman, I., & Pentland, J. (1996). The role of mental imagery in the creation of false childhood memories. *Journal of Memory and Language, 35*, 101-117.

Johnson, M.K., & Raye, C.L. (1981). Reality monitoring. *Psychological Review, 88(1),* 67-85.

Laurence , J. & Perry, C. (1983). Hypnotically created memory among highly hypnotizable subjects. *Science, 222(4623)*, 523-524.

Lindsay, D. & Read, J. (1994). Psychotherapy and memories of childhood sexual abuse: a cognitive perspective. *Applied Cognitive Psychology*, *8*, 281-338.

Loftus, E. (1993). Desperately seeking memories of the first few years of childhood: The reality of early memories. *Journal of Experimental Psychology:*

General, 122(2), 274-277.

Loftus, E., & Ketcham, K. (1994). *The myth of repressed memory: False memories and allegations of sexual abuse.* New York: St. Martin's Press.

Loftus, E., Polonsky, S, & Fullilove M. (1994). Memories of childhood sexual abuse: remembering and repressing. *Psychology of Women Quarterly, 18*, 67-84.

Marmelstein, L., & Lynn, S. (1999). Normative, group, and hypnotic influences in early autobiographical memory reports. *International Journal of Clinical and Experimental Hypnosis, 47(4)*, 301-319.

Mazzoni, G., Loftus, E., & Seitz, A. (1999). Changing beliefs and memories through dream interpretation. *Applied Cognitive Psychology, 13(2)*, 125-144

Orne, M. T. (1962). On the social psychology of the psychological experiment: with particular reference to demand characteristics and their implications. *American Psychologist, 17(11)*, 776-783.

Orne, M. T., Whitehouse, W. G., & Dinges, D. F. (1988). Reconstructing memory through hypnosis: Forensic and clinical implications. In H. Pettinati (Ed.), *Hypnosis and memory*. New York, NY: Guilford Press.

Paddock, J., Noel, M., Terranova, S., Eber, H., Manning,

C., & Loftus, E. (1999). Imagination inflation and the perils of guided visualization. *The Journal of Psychology, 133(6),* 581-595.

Pendergrast, M. (1995). Victims of memory: incest accusations and shattered lives. Hinesburg, VT: Upper Acess.

Polusny, M., & Follette, V. (1996). Remembering childhood sexual abuse: A national survey of psychologists' clinical practices, beliefs, and personal experiences. *Professional Psychology: Research & Practice, 27(1),* 41-52.

Poole, D.A., Lindsay, D.S., Memon, A., & Bull, R. (1995). Psychotherapy and the recovery of memories of childhood sexual abuse: U.S. and British practitioner's opinions, practices, and experiences. *Journal of Consulting and Clinical Psychology, 63,* 426-437.

Porter, S, Yuille, J.C., & Lehman, D.R. (1999). The nature of real, implanted, and fabricated memories for emotional childhood events: implications for the recovered memory debate. Law and Human Behavior, 23(5), 517-537.

Richardson, G., & Kelly, T. P. (2004). A study in the relationship between interrogative suggestibility,

compliance and social desirability in institutionalized adolescents. *Personality and Individual Differences, 36,* 485-494.

Sargent, M. A. (2000). What is the normal prevalence of vesicoureteral reflux? *Pediatric Radiology, 30(9),* 587-593.

Schneider, D. M., & Watkins, M.J. (1996). Response conformity in recognition testing. *Psychonomic Bulletin & Review, 3(4),* 481-485.

Sheehan, P. W., Statham, D., & Jamieson, G. A. (1991). Pseudomemory effects over time in the hypnotic setting. *Journal of Abnormal Psychology, 100(1),* 39-44.

Sherif, M. (1936). *The psychology of social norms.* New York: Harper & Row.

Spanos, N. (1986). Hypnotic behavior: A social-psychological interpretation of amnesia, analgesia, and "trance logic." *The Behavioral and Brain Sciences, 9,* 449-502.

Spanos, N., & McLean, J. (1986). Hypnotically created pseudomemories: Memory distortions or reporting biases? *British Journal of Experimental & Clinical Hypnosis, 3(3),* 155-159.

Tanford, S., & Penrod, S. (1984). Social influence model: a formal integration of research on majority and minority influence processes. *Psychological Bulletin, 95(2)*, 189-225.

Wade, K.A., Garry, M., Read, J.D., & Lindsay, D.S. (2002). A picture is worth a thousand lies: using false photographs to create false childhood memories. *Psychonomic Bulletin & Review, 9(3)*, 597-603.

Weekes, J., Lynn, S., & Myers, B. (1995). Hypnosis and pseudomemory: The effects of event base rates and distinctiveness. *Unpublished Manuscripts*.

Williams, L.M. (1994). Recall of childhood trauma: a prospective study of women's memories of child sexual abuse. *Journal of Consulting and Clinical Psychology, 62*, 1167-1176.

Wilson, S.C., & Barber, T.X. (1978). The creative imagination scale as a measure of hypnotic responsiveness: applications to experimental and clinical hypnosis. *The American Journal of Clinical Hypnosis, 20(4)*, 235-253.

Wylie, M. S. (1993, September/October). Trauma and memory. *The Family Therapy Networker*, 42-43.

Zajonc, R.B. (1965). Social Facilitation. *Science, 149*, 269-274.

APPENDIX

Appendix 1. Experimenter's Script

Hello, you/everyone is/are here today to take part in a study concerning one's ability to recall early memories of vivid events. People usually have a good deal of difficulty recalling events prior to about 3 ½ years old unless they are vivid or emotional. So, sometimes adults can recall a 3rd birthday party, and many times they can recall visits to the doctor or hospital, or moving into a new home. We are interested in people's ability to recall these early memories, and the ways in which these memories are accurate or distorted in some way.

Now, not all children move into a new home when they are very young, or have to go to a hospital because they are sick. However, most children go to the doctor at very early ages to receive their immunization shots. Another common medical procedure years ago was that children were routinely given X-rays to check the development of their urinary system, usually when they were about 2 ½ to 3 1/2 years old—right about the time they went through potty training. Up until about 10-15 years ago, it was common for pediatricians and family doctors to perform these x-rays to determine whether the child experienced a disorder called vesicoureteral reflux or VUR. This refers to the reversal of urine flow back and into the kidneys. It happens to very young children whose bladder functioning does not

develop quickly enough. In most instances, the disorder can cause the urinary tract to become infected as well as significant kidney damage if gone untreated. If caught, it can be easily corrected with a minor surgical procedure.

Pediatricians, general practitioners, or nephrologists can check for the disorder using an intravenous urogram or IVU. It involved the insertion of a catheter and injecting a dye into the bladder so the doctors could tell, using x-rays, whether the dye was leaking back into the kidney. The procedure could be somewhat painful, and is likely a fairly traumatic experience for a young child. Because the procedure it typically performed the same way each time, and because it was once so common, we are using that as the vivid and emotional memory we want to examine.

The procedure is rarely performed today because we rely so heavily on ultrasound now. Abnormal kidney and bladder development can be identified even before the baby is born. What I'd like to find out today is whether you can recall this procedure happening to you, and how good your memory is for what happened.

To each subject:

Can you recall this event occurring?

After confederates (and subjects) respond with "no," say the following:

(If subjects respond with "yes," tell them that in a minute you are going to ask them to recall all they can about the event.
Even though this event probably happened to you when you were very young, people can still recall events up to a very young age—especially if the events are emotional and vivid. Early traumatic events are usually recalled with a great deal of clarity. I'm going to be asking each of you to relax and imagine yourself at a younger age. You/everyone will then be mentally recreating the thoughts, feelings, emotions, and sensations that were felt at that age. By recreating these experiences, old, forgotten memories will be triggered such that you can re-experience them. From that point, I will be guiding you/everyone through the course of what the day in question might have entailed.

(To the first confederate or individual)

Okay, I want you to close your eyes and relax. Take several slow deep breaths and exhale slowly. Keep your eyes closed and try to see yourself in the examination room. It was probably in the hospital or perhaps it was in a smaller building where your doctor's office was. Now, I want you to imagine yourself as a small child. Picture yourself how you looked then. Try to remember the clothes you normally wore.

How old do you see yourself? (rhetorical)

Good.

Now, I want you to remember the day in question; the day of this procedure.

Non guided-imagery procedure: In most cases, all that is needed to recall a memory is deep concentration. Keep your eyes closed. I want you to relax and let your mind enter a state of deep concentration. Concentrate on the experience. Try hard to focus.

Guided-imagery procedure: Keep your eyes closed. Let your mind wander and visualize the events as I describe them. You can use these images as guides to reconstruct your own memory. Visualize the doctor's office, the various instruments on the wall. Look up at the lights and see how bright they are. The doctor and an assistant are getting you ready for the procedure.

You are wearing a gown with ties in the back. The table you are lying on is cold, stainless steel. It has a paper covering over it. A nurse paints a mustard-colored substance over your private parts. She tells you it is to prevent infection. It feels cold. Concentrate on the sensation.

Imagine yourself lying back---you can see the doctor working over you. You feel the catheter being inserted. They tell you they are going to insert the dye. You can feel your bladder getting heavy and full. You can see the blue liquid going through the tubes from a bag resting on a tall pole. Focus on the sensations and the sounds in the room with you.

See yourself at the procedure. Remember how you felt, remember what you saw. You are experiencing it right now...Keep your eyes closed...

Now, tell me all you can remember about that event.

Can you remember the name of the doctor?

Can you remember who took you to the procedure?

Can you remember anything else that happened in the doctor's office?

Tell me everything you can recall.

(Wait a few moments after participant is silent)

Can you recall anything else?

(Repeat until participant says they cannot recall anything else)

(Repeat with each subject)

Okay, that's good.

Please fill out the following questionnaires.

Appendix 2. Questionnaire used to measure dependent Variables.

Please complete all the questions that follow. After you have done so, please wait until the experimenter collects the materials from you and completes the session.

1. Please rate how confident you are that the event happened as you remembered it?

1	2	3	4	5	6
very confident no memory for event					very confident memory for event

2. I want you to think for a moment about your memory for the medical procedure. Please rate how clear that memory is.

1	2	3	4	5	6
not at all clear					extremely clear

3. It is natural for people to forget past experiences, especially if they occurred long ago. Regardless of your memory for the procedure, how certain are you that the event occurred?

1	2	3	4	5	6
not at all certain					extremely certain

4. To what extent did you feel pressured to report a memory?"

1	2	3	4	5	6
not at all pressured					extremely pressured

What is your **age**?_____

What is your **gender**? M F

Ethnicity

_____ Caucasian _____ Asian

_____ African American _____ Hispanic

_____ Native American _____ Other

What is the earliest age you believe individuals can recall events from childhood?

0	1	2	3	4	5
less than 1 year of age	between 1 & 2 years	between 2 & 3 years	between 3 & 4 years	between 4 & 5 years	more than 5 years of age

What do you believe the purpose of this experiment to be?

_____

_____

_____

_____