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The Hidden-observer and Memory Creation

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of  
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## Abstract

### The Hidden-observer and Memory Creation

Hana Moghrabi

The present study sought to investigate the relation between hidden-observer reports and pseudomemory. The study also investigated the rates of hidden-observer responses in age regression. During the screening session subjects were tested on (a) the Tellegen absorption scale (Tellegen, 1980, 1982), (b) The imagery scale of Paivo and Harshman's (1983), Individual Differences Questionnaire, (c) the Autobiographical Memory Questionnaire (Conway, 1994), (d) The Harvard Group Scale of Hypnotic Susceptibility, Form A of Shor and E. Orne (1962). Two experimental groups with different instructions about memory and a control group, participated in a further session to measure their responses to a memory creation item, and to assess the rates of hidden-observer responding. Consistent with previous literature both the phenomenon of memory creation and an increase in confidence in these memories were demonstrated. Memory strength was found not relevant to memory creation. The factors that predicted memory creation were hypnotizability, duality, and cognitive effort. A schema-model was presented to explain the results of this study. Rates of hidden-observer reports by low and medium hypnotizables emphasized the importance of both individual and contextual variables for producing a hidden-observer response. These results were explained as supporting a synergistic model of hypnosis.

I Dedicate this Thesis to My Mother

*Laila Bahar*

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Although historically hypnosis was developed as a treatment for medical and psychological problems, one of the major uses of hypnosis in recent years has been to retrieve memories in two situations: The first is eyewitness testimony, where hypnosis is used either to overcome amnesia or to supply new details of an event. The second is in clinical settings, where it is used to help clients "recover" memories of childhood traumas. A critical assumption in both situations is that these recollections are veridical renditions of events in the history of the person. However, in the last two decades a large body of literature has pointed out serious problems with hypnotically recovered memories (Orne, 1979; Laurence, & Perry 1983; Barnier & McConkey, 1992; Lynn, & Nash, 1993; Ofshe, & Watters, 1993). These problems include, but are not limited to, subjects' developing confabulations to fill in memory gaps and hypnotically creating memories, which are confused with reality. For example, hypnotized witnesses were found to be more prone to error following leading questions, than non-hypnotized witnesses, they are no more accurate than waking subjects in response to non-leading questions. Moreover, the more directive the questioning, the greater are these effects (Dywan & Bowers, 1983).

Recent research (Lynn, Mare, Kvaal, Segal & Sivec, 1994) has demonstrated the potential usefulness of the "hidden observer" suggestion to elicit meaningful information, in both clinical and forensic situations. Taking into consideration the problems involved in hypnotically recovered memories, the accuracy of reports elicited following the hidden-observer (HO) suggestion need to be investigated: Does the "hidden-observer" allow subjects to report more memories of factual events, or is the conception of the HO

better understood as a demand for reporting more information? The latter case, would increase the risk of memory creation, a risk demonstrated by research findings which show that hypnosis can increase confidence of recalled events with little or no change in the level of accuracy.

### Autobiographical Memory

Autobiographical memories are recollections of self-referenced information gleaned from everyday life events (Barclay, 1986; Neisser, 1986). Recent findings suggest that autobiographical memories are accurate in some respects. Thus, people can correctly identify many events that actually happened in their lives, even after very long time periods. However, such memories are also inaccurate since people tend to falsely identify non-events as their own, if those non-events are consistent with what they expect would have occurred in their lives (Neisser, 1976). Recollections deduced from expectations about what could have happened in the past imply that autobiographical memories are not the result of direct access to a storehouse of life events. Instead, most (if not all) autobiographical memories seem to reflect selective and re-constructive processes which one uses to focus, tie together, and abstract meaning from daily experiences (Bartlett, 1932; Neisser, 1986).

Research of autobiographical memories dates back to the late 19th century. The early insights concerning autobiographical memory by writers such as Ribot, Galton, Freud, and Bartlett, continue to have influence on research today (Conway, 1990). In his book *Remembering: A study in experimental and Social Psychology*, Bartlett (1932) emphasized the reconstructive nature of remembering:

By the aid of the image, and particularly the visual image ... a man can take out of its setting something that happened a year ago, reinstate it with much if not all of its individuality unimpaired, combine it with something that happened yesterday, and use them both to help him solve a problem with which he is confronted today (p. 219).

There is an astounding parallel to these thoughts in recent memory research. Many studies show that memory of past events could be inaccurate and could easily be contaminated. Critical details of an experience could be forgotten or become distorted, or their source or order could be misremembered (Conway, Collins, Gathercole, & Anderson, 1996; Loftus, 1993). Furthermore, completely new details may be incorporated into a memory under some circumstances (Laurence & Perry, 1983; Labelle, Laurence, Nadon & Perry, 1990). There is also evidence that people can incorporate completely false events into their memories (Loftus, 1993; Hyman, Husband & Billings, 1995).

Loftus (1993) demonstrated that a complete memory could be created in an experimental setting. The subject, fourteen-year-old Chris, was falsely convinced by his older brother Jim that he had been lost in a mall when he was five years old, and that an elderly man had helped him find his parents. One day after his conversation with Jim, Chris remembered things about the nonexistent man and remembered even more over the next five days. After two weeks he could even remember clearly and vividly the bald head and glasses of his rescuer. Chris was very confident in the veracity of his memory and expressed dismay when he was debriefed.

A study by Hyman et al. (1995) investigated whether college students would create a false memory of a childhood experience in response to misleading information and repeated interviews. They contacted parents to obtain information about events that happened to their subjects during childhood. In a series of interviews, they asked the students to recall and

describe the parent reported events. Subjects were cued by the title of the event (e.g., Family vacation) and age (e.g., at age five). One false event was inserted between these memories (e.g. being hospitalized for one day at age 5). None of the subjects recalled the false event in the first interview, even though some of them talked about similar events. In the second interview, one week later, 20% of the subjects incorporated the false events into their reports. Subjects were equally likely to create false memories at all cued ages. The authors concluded that incorporating information about remembered events in response to the social context is a general phenomenon. The social demands to remember could be more intense in therapeutic or forensic settings which may lead to even great false recall. In therapy, the client is motivated to find answers to his/her personal problems, and remembering is presented as crucial for healing. Searching for memories by repeated questioning and providing cues that may be incorporated, may result in the creation of false recall. The same pressures apply in a forensic setting.

### Pseudomemory

Pseudomemories are memories believed to be based on personal experience of an event, but which in fact are created and based on information learned or suggested after the event. "Pseudo" comes from the Greek word *pseudes*, which means "to deceive" (Rogers, 1995. p. 7). Other derivatives of the meaning are "false", "sham", "pretended", and "fictitious", which all mean that a pseudomemory is not a memory at all.

Awareness of memory creation dates back to the late 19th century. In an early work on created memories (cited in Laurence & Perry, 1983), Bernheim suggested to a female subject under hypnosis that she had awakened four times during the previous night to go to the toilet and had



fallen on her nose on the fourth occasion. After hypnosis, she was confident that the suggested events had actually occurred, despite Bernheim's insistence that she had dreamed them.

Pseudomemories are by no means limited to hypnosis. Another anecdotal account of false memory outside the context of hypnosis is demonstrated by Piaget's childhood memory of an attempted kidnapping when he was an infant (cited in Loftus, 1993). The false memory stayed with him for at least a decade. He found out that it was false when his nanny confessed years later that she had made up the entire story and felt guilty about keeping the watch she had received as a reward from his parents. To explain this false memory, Piaget assumed that he, as a child, must have heard this story which his parents believed, and projected it to the past in the form of a visual memory.

Memory distortions are quite common, and may cause little or no problem in every day life; but they pose considerable concern in other situations. For example, accepting recovered memories of child sexual abuse as true without verification can lead to damaging effects for both the parent and the person who recovered the memory. The problem of possible false accusations is wide spread; for example, Wakefield and Underwager (1992) sent a "recovered memory" questionnaire to 600 families in which a member had recovered memories of Child Sexual Abuse (CSA) denied by the family. In one third of the cases mothers were accused with the fathers, and in one third a variety of other people were accused along with the parents. The abuse was said to have happened at a very early age, 41% at age 2 or younger, 38% from age three to five, and 21% of the cases at age six and above. The number of years during which the memories were said to have been repressed ranged from 8 to 51 years with a median of 25 years. These accusations have

led to a heated debate concerning the veracity of recovered memories and to a battle of accusations from both sides, each gathering expert opinions to support their claims. The question of who is telling the truth, the accuser or the accused, remains unsolved (Bekerian, & Goodrich, 1995).

Within the psychological community, different theoretical perspectives contribute to the controversy. On one side are those who believe that early memories could be recovered through hypnosis or other kinds of memory therapy, and that recovered memories nearly always represent actual traumatic experiences. They point out the long term effects of trauma on psychological health, and suggest that the experimental study of memory fails to capture the reality of traumatic memory in clinical settings (Ewin, 1994). Some look at memory research as a backlash against the increased awareness of the wide spread occurrence of sexual abuse (Enns, McNeilly, Corkery, & Gilbert, 1995; Gutheil, 1993), citing as evidence incidents where recovered memories of abuse that were corroborated (Enns, McNeilly, & Corkery, & Gilbert, 1995; Schooler, 1994; Zaragoza, & Mitchell, 1995; Ewin, 1994).

On the other side, critics of memory work in therapy are concerned with the historical veracity of recovered memories. They point to the dangers of memory creation using techniques to enhance remembering. Those practices include: (a) communicating to clients who have no recollection of CSA trauma that their symptoms are indicative of CSA history, (b) using hypnosis, age regression and guided imagery to enhance remembering, (c) interpreting dreams and physical symptoms as memories of CSA, (d) joining survivor groups, or reading self help books, (e) endorsing all reports of abuse and countering clients doubts about their memories (Lindsay, 1994). Critics argue that these techniques are highly suggestive and may coerce, confuse, or

influence a person into believing things that are not true, leading to the creation of false memories in response to therapist's expectations.

The role of beliefs in shaping one's experiences is very well demonstrated by the eminent constructivist George Kelly (1955). Kelly considered that the individual beliefs (as well as socio-cultural beliefs or paradigms) serve as "hidden hand editors" that predetermine the outcome or results of any experience. They are hidden-hand editors because they have a powerful role in influencing the persons employing them. This role remains unrecognized and unknown to the person concerned. Beliefs help predetermine and construct the knowledge a person has, maintain it, and defend it. Thus it plays an important role in deciding what to know. Therefore, beliefs about memory play an important role in the suggestibility of memory, and judgments about the veracity of subsequent recollections (O'Sullivan, & Howe, 1995). For example, the belief that memory is permanently and faithfully stored in the brain, and that it is invulnerable to suggestions, would prevent the believer from taking any defensive action when exposed to potential interference, and subsequently, he/she will not doubt the veracity of his/her recollections. By the same token, such beliefs among psychologists will affect their strategies of gathering and interpreting information, making them ignore the information that are inconsistent with their own beliefs, regardless of its external validity.

One of the strategies used most to recover memories of traumatic events is hypnosis. Recently, warnings about the dangers of this technique have been raised frequently in the literature. One important factor in this context is the therapist's beliefs about hypnosis and memory. False beliefs may lead to misuse of hypnosis in attempts to help clients recover memories, raising the possibility of recovering suggested rather than actual memories

(Yapko, 1994; Bloom, 1994; Loftus, Garry, Brown & Rader, 1994; Gravitz, 1994; Legault & Laurence, 1996). A survey regarding therapists' beliefs about suggestibility and hypnosis, in relation to memory, indicated that a significant number of therapists believe that memories obtained under hypnosis are more accurate than those obtained in the wake state, and that early memories could be retrieved using hypnosis (Yapko, 1994). The data came from 869 professional psychotherapists across the United States who responded to statements with which the respondents could agree or disagree. Nearly half (47%) of the respondents agreed with the item "Psychotherapists can have greater faith in details of a traumatic event when obtained hypnotically than otherwise". Also, 18% believed that "People cannot lie under hypnosis", and 31% agreed that "when someone has a memory of trauma while in hypnosis, it objectively must have happened". More than half the respondents (54%) agreed that "Hypnosis can be used to recover memories of actual events as far back as birth". A large proportion of respondents (79%) agreed that it is possible to suggest false memories to someone who then incorporates them as true memories, and 19% answered "yes" they knew of cases where it seemed highly likely that a trauma was suggested by a therapist. Considering that the "yes" response format used in this questionnaire may indicate more than one case, the number of created memories could be alarming (Yapko, 1994).

A similar pattern of beliefs in the validity of recovered memories is endorsed by psychotherapists in Quebec (Legault, & Laurence, 1996). A questionnaire was mailed to 900 psychotherapists of different orientations, that investigated three relevant areas: The prevalence of cases of recovered memory of child sexual abuse, memory techniques used in therapy, and support for the recovered memory validity among therapists (social workers, psychologists, and psychiatrists). From the 220 questionnaires returned, 55%

of respondents reported at least one case of recovered memory over the previous two years. Respondents reported that an average of 4.31% of clients who began therapy with no memories of abuse recovered such memories.

Even though some familiarity with the notion that memory is malleable seemed to be widespread among respondents in this study, this notion was not consistently applied to the specific contexts of hypnosis and memory of trauma, and general support for the validity of recovered memories of child sexual abuse was expressed. Support for the validity of recovered memory correlated with the number of techniques used, and the number of techniques correlated with the proportion of cases reported. Furthermore, the support for the validity of recovered memory contributed to the prediction of the rate of memory recovery cases. The authors concluded that when clinicians are ignorant of their ability to influence clients, they are likely to assume that recovered memories are produced independently of themselves, and to take these memories as a proof of accurate recovery.

The notion that memory is a reconstructive process (as opposed to stored material) is strongly implied in recent research findings. Consequently, as long as we lack the means to distinguish true elements in any memory from false ones, and/or as long as the risk of creating a complete memory is possible, caution in accepting recovered memories as valid is warranted. Corroboration of early memories is usually a hard impossible task. This is especially true when memories are recovered after decades, when corroboration may depend only on the confession of the perpetrator. Finding a solution for this problem requires more research on memory processing (both in hypnosis and without it), to increase our understanding of the dynamics of memory in general, and to verify contextual and individual variables that increase the likelihood of creating pseudomemories, or decrease

the likelihood of it. Of course, one can never be certain that a memory is false or true, we can only infer the probability that a memory is false based on data taken from subjects themselves before and after hypnosis. One question relating to this problem and of concern in this study is whether a complete memory of an event can be created under hypnosis, and how a subject's confidence is influenced by the hypnotic experience.

### Hypnosis

The term "hypnosis" comes from the Greek *hypnos*, which means sleep, or the "God of sleep" was introduced by James Braid (1795-1860). Braid thought first that the hypnotic state is produced by the fatigue in the muscles of the eyes. He tried to change the term later on when he recognized that the hypnotist influences the subject by suggestion rather by any direct physiological effect (Udolf, 1987). Similarly, Liébeault (1823-1904) and Hippolite Bernheim (1840-1919) were prominent spokesmen for the notion that hypnosis involves suggestion, as shown by Bernheim's statement "there is no hypnotism; it is all suggestion" (Moss, 1965). In contrast to this view, Jean-Martin Charcot (1825-1893), who was interested in the similarities between hysteria and hypnosis, viewed hypnotic ability as associated with pathological states and as physiologically based. This conceptualization was modified and expanded upon in Janet's concept of "dissociation" in 1925. Dissociation was used to explain how ideas and behavioral patterns that normally occur together or in sequence become separated or dissociated from one another. A similar debate about the status of hypnosis continues till today (for a review see Laurence & Perry, 1988; Ellenberger, 1970).

Although there is no common agreement among modern theorists about what hypnosis is, two main perspectives have dominated the field:

Hilgard's (1979) neodissociation perspective, also endorsed by others such as Bowers (1991) and Evans (1991). And the sociocognitive perspective endorsed by Sarbin and Coe, (1972), Barber (1969), and Spanos (1986) among others. According to the Neodissociation approach, dissociative mechanisms explain hypnotic phenomena. Hilgard's theory implies the existence of multiple cognitive processing systems or structures. These are arranged in a hierarchical order, but each is independent, with its own inputs and outputs, and with multiple feedback relations between them. At the top of these structures there is an "executive ego" or central "control structure", which has the planning, monitoring, and managing functions that are required for appropriate thoughts and actions involving the whole person. In hypnosis, effective suggestions from the hypnotist take much of the normal control away from the subject by influencing the executive functions themselves and change the hierarchy of the substructures (Hilgard, 1991).

Hilgard offered his experiments of hypnotic analgesia and what he called the "hidden-observer" phenomenon (see below) as the best support for his formulations. For example, when exposed to appropriate suggestions, some hypnotized subjects report reductions in pain in response to appropriate suggestion, yet also report experiencing high levels of pain at the same time when "hidden-observer" instructions are given by the hypnotist. The contradictory reports are interpreted as indicating that hypnotic subjects process information at two levels of consciousness simultaneously. They remain consciously aware of information at one level only as a result of the fractionation in the control system. The hidden report (covert pain) is assumed to come from a dissociated part of the subject that processes information according to the reality principle. Hilgard proposed amnesia or an amnesia-like barrier as the underlying mechanism of dissociation.

More recent views of neodissociation theory identified problems in accepting amnesia as the mechanism of dissociation, at least in hypnotic analgesia, because of its lack of power to explain certain phenomena: For example, Bowers (1992) pointed out that the amnesia in hypnotic analgesia is not suggested, so that spontaneous amnesia (which is quite rare) is to be assumed. Thus, it is unclear how something rare (spontaneous amnesia) can account for something quite common (hypnotic analgesia). This amnesia differs from posthypnotic amnesia; That is, unlike post hypnotic amnesia, the hidden pain was never in the conscious awareness of subjects. The difference, however, is not further specified. Furthermore, studies failed to demonstrate the relationship between amnesia and pain reports. That is, amnesia scores could not predict differential pain reports. Finally, the amnesia is highly selective for reasons that are not understandable. For example, the pain and the cognitive effort involved in reducing it are the amnesic components, but not the suggestions for analgesia or the goal directed fantasies that accompany the reductions in pain.

Instead of amnesia, Bowers suggested, the second mechanism proposed by Hilgard (1979), the "dissociated control", as the mechanism of dissociation. According to this model, under hypnosis, the executive control system's influence is reduced, and lower subsystems become more responsive to suggestion. In other words, suggestions administered during hypnosis can activate subsystems of control which are partially or temporarily dissociated from conscious control (Bowers, & Davidson, 1991; Bowers, 1992). Usually, the subjective experience of volition reflects executive control over behavior. This experience is bypassed by directly and independently activating the subsystems by suggestions. Thus, the dissociated pain is achieved by direct



and automatic activation by suggestions, and without the need for cognitive strategies and effort.

Unlike the neodissociationist theories, the sociocognitive perspective puts more emphasis on contextual variables and sees hypnotic responding as actively achieved by subjects, not imposed on them directly by the hypnotist's suggestions. Sarbin (1950) was the first to account for hypnotic responding in terms of "role enactment" actively generated by subjects who use contextual information to create the hypnotic behavior. The efficiency with which subjects succeed in acting their role depends in part on the degree to which they possess relevant skills such as imagination, attention focusing, and the skill of maintaining a consistent self-narrative (Sarbin, & Coe, 1972; Sarbin, 1994). According to Sarbin (1994), such skills facilitate goal-directed actions in the service of maintaining an acceptable self-narrative, and the use of self-deception as an adaptive strategy to achieve counterexpectational conduct during hypnosis.

Investigators within this approach have focused on the detailed examination of individual hypnotic phenomena, and the ways in which subtle and ambiguous social demands influence subjects' responses to various hypnotic suggestions (for review, see Spanos, 1989). Proponents of this model explain hypnotic behavior as context-dependent social actions that reflect the conception of hypnosis shared by the hypnotist and the subject. The role played is influenced by the subjects' motivations, beliefs, and expectations, and facilitated by the subjects' knowledge about hypnosis. The subjective experience of nonvolition experienced by the hypnotized person results from attributional errors, or self-deception. For example, hypnotic analgesia may be achieved by reinterpreting sensory experience, rather than reducing the intensity of sensory experience.

Another line of investigation falls somewhere between the two previous theories. The synergistic model (Nadon, Laurence, & Perry, 1991) is an example of what is called the interactive phenomenological approach. According to this model, hypnotic behavior is seen as multidetermined, and is produced by the interaction of personal predispositions (e. g., imagery and absorption abilities, and hypnotizability), with situational factors (e.g., beliefs, expectations, social pressure). This model stresses how aspects from the testing context act upon pre-existing individual differences to elicit hypnotic behaviors and give rise to a wide range of individual differences in the subjective experience of hypnosis.

Some personality characteristics have been associated with hypnotizability, such as imagery and absorption. Imagery plays an important role in hypnosis. It can facilitate the subjective experience of suggested events. The association between imagery and hypnotizability is consistent with all current theories of hypnosis. A positive association is consistently found. Most highly hypnotizable subjects also score high on imaginative involvement. Imagery as measured by many scales does, therefore, seem to predict hypnotizability. However, the relationship is surprisingly small and apparently accounts for far less than 10% of the variance in hypnotizability (Kirsch & Council, 1990). In addition, many low and medium hypnotizable subjects score high on this trait. It is argued that imagination may be more important as a mediator of hypnotic responding for low hypnotizables, while it serves as a marker for dissociation in highs (Bowers, 1992).

A second trait that is associated with hypnotizability is absorption. Absorption is defined as a predisposition, or openness to experience alterations of cognition and emotion over a broad range of situations (Roche, & McConkey, 1990, cited in Crawford, & Gruzelier, 1992). The Tellegen's

Absorption Scale TAS (Tellegen & Atkinson, 1974; Tellegen, 1982) is used for measuring this ability. The TAS correlates consistently but moderately (it explains 10% of the variance) with hypnotic ability as measured by the Harvard Group Scale (SGHS) of Shor and Orne, 1962 (Bowers, 1992). However, it was found that absorption scores correlated much higher with some of the difficult items of the scale than with easier items, suggesting that absorption may be an excellent measure of true hypnotic ability (Balthazard, & Woody, 1992). That is, absorption is seen as the factor of hypnotic responsiveness that is more concerned with genuine, internal alteration of perception and cognition, than with behavioral compliance to external demands (Bowers, 1992).

### Age regression

The concept of age regression is important for both understanding hypnosis and for its application in clinical and forensic contexts. In a typical age regression experience, the hypnotist tells the subject that he/she is becoming younger and smaller and going back to some earlier time in life (such as 5 years old, or to the first grade). The subjective experience of high hypnotizables during age regression may take one of two different forms (Laurence & Perry, 1981). In one form the subject may feel completely absorbed in the experience of a child and act like a child. They may show behavioral changes such as talking with child-like voices. In the other form, the subject may report the experience of being the child, while maintaining the experience of an observing adult simultaneously, or in alternation. This is called "duality" or "divided consciousness".

Usually, age regression is used during hypnosis to enhance memory of previous events. Using age regression (either in a clinical or forensic setting)

to retrieve memories implies that genuine psychological regression is possible, and consequently, that the retrieved memories are considered true and reliable. The validity of retrieved memories by age regressed people would be supported if it could be demonstrated that genuine regression is indeed possible. The subjective experience of age regressed subjects seems compellingly true and real. But what is truly regressed in age regression?

To address this question, Nash (1987), reviewed 60 years of empirical studies (80 studies) investigating subjects' functioning during age regression on physiological, cognitive, perceptual, and personality dimensions. These studies tested whether there is a reinstatement of childhood faculties across these dimensions in hypnotically age regressed subjects. To evaluate the outcome of these studies, a two-part criterion for genuine age regression (offered by Parrish, Lundy, and Leibowitz, 1969) was adopted. That is, "age regression would be established when responses typical of children but not of adults are produced under hypnotic age regression, and when these responses are not produced under a waking suggestion". It was found that either most studies reporting childlike behaviors in age regressed subjects suffered from methodological flaws, or in well-designed studies, the regression criteria were not satisfied.

For example, in evaluating the physiological responses in age regressed subjects, no convincing evidence that infantlike EEG patterns are reinstated was ever found. Three studies have claimed the return of childlike reflexes (e.g., the Babinski response). Another study showed that the relaxation and decreased muscle tone during hypnosis was sufficient to elicit the Babinski response without suggested age regression. Thus, this behavior could not be attributed to a return of childlike physiological functioning, but to the hypnotic situation.

Serious methodological weaknesses were also found in studies investigating cognitive functioning and reporting enhanced recall of childhood events for hypnotically age regressed subjects. For example, in one study by True (1949), 81% of subjects correctly recalled the day of the week on which events in their childhood occurred (e. g., Christmas and birthdays at ages of 10, 7, and 4 years). In this experiment, however, the hypnotist was aware of the correct date , and the inquiry progressed as follows: "Was it Monday? Was it Tuesday? Was it Wednesday?". Thus, verbal and nonverbal cues could be passed from the experimenter to the subject. When this methodological flaw was corrected in subsequent studies, subjects failed to recall correctly the day of the week beyond the chance level. Furthermore, no evidence of reinstatement of earlier cognitive processing on IQ tests and spelling, or on Piagetian measures of cognitive and moral development was found in well designed studies. Hypnotized subjects were no more childlike than were motivated controls.

As for subjects' perceptual processing performance, one study reported that age regressed hypnotic subjects responded to the Ponzo illusion in a manner typical of children, while task motivated subjects failed to match this performance. Nevertheless, four subsequent studies failed to replicate these findings. In another area of perceptual processing, some studies reported eidetic-like imagery in their age regressed subjects (eidetic imagery was supposed to be relatively common in children but uncommon in adults). However, it was found that hypnosis alone was sufficient to produce this kind of imagery. It was concluded that age regressed subjects exhibit this kind of imagery not because of a return to childhood functioning, but because hypnosis may have facilitative effects on imaginal processing, with a shift

from a sequential, verbal, and logical mode during waking state to a more visual, holistic style during hypnosis.

Finally, psychological assessment measures were used to detect childlike performance in the personality dimension. For example, early studies using projective tests (e. g., Rorschach, Thematic Apperception Test, Bender Gestalt Test) seemed to suggest that psychological protocols of age regressed subjects are similar to those of young children. All but one of these studies involved observation of only one subject. Subsequent studies using the real-simulator or task-motivated control procedures found the psychological protocols of age regressed and task motivated subjects easily distinguishable from those of actual children. A reinstatement of child affective enactment was reported in two studies, where age regressed subjects recalled transitional objects (e. g., teddy bear and blanket) with the spontaneity and intensity that matched the behavior of young children, and both differed from simulators. Nevertheless, the authors rejected their position in a subsequent study that tested the accuracy of recall (see below).

From this review, it can be safely stated that despite the seemingly compelling reality of the subjective experiences of age regressed subjects, hypnotic age regression can not be taken as indicating actual regression. Subjects' performance is not accurately childlike, indicating that literal regression to the past is very unlikely. According to Nash, hypnotically regressed subjects may undergo some changes in the mode of thinking that is different from waking state, and consequently, a change in their subjective experience occurs. In fact, high hypnotizables give compelling portrayals in age progression to the future, as well as in regression to prenatal life or past incarnations.

### Age regression and Memory

As stated earlier, hypnotic age regression is used to facilitate remembering or to breach amnesia for childhood traumatic events. One of the theoretical concepts underlying using this method is the concept of repression. In their book *Studies in Hysteria*, Breuer and Freud (1895) demonstrated a causal connection between hysterical symptoms and unfortunate traumatic childhood experiences. They observed that if these memories were recalled with sufficient vividness, the symptoms disappeared. Forgetting in these instances was not apparently a passive but an active process in which the painful memory was pushed out of awareness. Nevertheless, Freud was not in favor of using hypnosis, and he acknowledged that recovered memories may be inaccurate or untrue, stating that there is no way to isolate the repressed memory from fantasies and later constructions and modifications by patients.

Another theoretical concept underlying the clinical use of hypnotic age regression is dissociation. Pierre Janet, working with hysterical patients, was the first to present dissociation as a psychological defense against overwhelming traumatic experiences (van der Hart, & Horst, 1989). Following his observations of dissociation in one of his patients, Lucie, Janet recognized the role of altered states of consciousness with their state-dependent memory and cognition in producing dissociative pathology such as multiple personality disorder (MPD). According to Janet, the dissociated nuclei of consciousness are formed from subconscious automatism, and become independent from the central personality (van der Hart, & Horst, 1989; Putnam, 1989). It is worth pointing out that Janet raised the possibility of role playing in MPD, noting that one of his patients, Léonie, displayed a personality that was role played to please the hypnotist (Ellenberger, 1970).

The notion of dissociation enjoyed renewed support from the recent popularity of MPD as a psychiatric diagnosis, and as a theoretical explanation of hypnotic phenomena.

The increased productivity of hypnotized subjects may give the illusion of better recall of events in hypnosis. Nevertheless, despite their greater productivity, hypnotic subjects' recall of childhood events appears quite prone to distortion and inaccuracy. For example, Nash, Drake, Wiley, Khalsa and Lynn (1986) investigated the accuracy of the factual recall of transitional objects by 16 age regressed high hypnotizables compared to a control group in a real-simulator study. Memories were verified against the accounts of mothers. Sixty-four percent of hypnotized subjects and 50% of control subjects displayed transitional object recall. Hypnotic subjects reported a total of 15 objects during age regression, from which only three matched their mothers' reports. All 15 objects recalled during age regression were also recalled during posthypnotic recall, despite the fact that only three of them were substantiated by the mothers. Simulators reported a total of 10 objects during the age regression procedure (only one accurate), and only two of these were carried over to the post-simulation condition. Furthermore, hypnotized subjects showed more confidence in recalled memories post hypnotically. That is, they carried over all hypnotic recollections to waking recall, a trend that was not seen in control subjects, where only two out of ten objects were carried over to the posthypnotic session.

The greater productivity of age regressed subjects can be useful in some situations of eyewitness interrogation. For example, subjects regressed to the time and place of the event may give more details that prove helpful. Kroger (cited in Ewin, 1994) was able to age-regress a witness to the Chowchilla



kidnapping scene during which he could recall all but one of the license numbers of the van driven by the kidnappers.

In clinical situations, age regression can be therapeutically beneficial. For example, Baker and Boaz in 1983, and Lamb in 1985 (cited in Udolf, 1987), reported a technique for the treatment of phobias in their patients. The method consisted of age regressing the patient to the original trauma and then modifying the memory of the event with a hypnotic implant that rendered the event less traumatic. When clients were re-regressed, they seemed to have incorporated the events of the implanted memory with the original events. Improvement was maintained at a follow-ups ranging from one to three years.

Nevertheless, just as it is possible to implant positive memories to alleviate the anxieties and troubles caused by a bad experience, incorporating a false memory of an unpleasant event is also possible. This may lead to negative consequences that affect the well being of the person and those around him/her. The apparent ease with which pseudomemories can be incorporated into and confused with real memories has serious implications for the dangers of hypnotic memory retrieval, when the memory is of negative events. This is a two edged effect that opens the door for both the effective use and the misuse of hypnosis.

In the last two decades, research findings have demonstrated clearly some of the dangers involved in using age regression for the purpose of retrieving memories of past events. These findings prove not only that retrieved memories are not an exact replay of historical events, but also, that the experience of age regression may actually contaminate later waking memories (Laurence & Perry, 1983; Labelle, Laurence, Nadon & Perry, 1990; Spanos & McLean, 1986; Nash, Drake, Wiley, Khalsa & Lynn, 1986). The most cited experiment on memory creation in hypnosis is that of Laurence et al.,

1983, in which 27 high hypnotizables were hypnotized and regressed to one night of the previous week. They were asked to describe their activities for the last half-hour before they went to bed. Later on, subjects were age regressed to the same night and were asked if they heard loud noises that awakened them. All but ten subjects reported hearing noises. When interviewed posthypnotically by another experimenter, 13 subjects stated that the noises actually took place. Six subjects were very certain of the reality of the memory. Even after they had been told that noises had been suggested to them they maintained that the noises had actually occurred. The authors cautioned that memories could be modified after hypnosis, and that an unsure victim or witness could become more certain after a memory refreshment procedure.

One of the most consistent findings in the pseudomemory literature is that hypnotizability is related to pseudomemory, in hypnotic and non hypnotic contexts. A series of studies (Sheehan, Statham & Jamison, 1991a, 1991b) investigated the effects of hypnotizability level and state instructions (hypnosis vs. waking states) on pseudomemory production. They suggested false memories to high, moderate, and low hypnotizable subjects, in a hypnotic and a waking condition. When tested two weeks after the pseudomemory suggestions (Sheehan et al, 1991a), or immediately after (Sheehan et al, 1991b), more pseudo memories were reported in the hypnotic than waking conditions. Moreover, high hypnotizables reported more pseudomemories than moderate or low hypnotizables in both conditions. These studies suggest that both hypnotizability and the hypnotic context increase the likelihood of memory creation.

Nevertheless, it seems that high hypnotizability is not necessary to elicit pseudomemories, and that other variables also add to the risk of creating

them. For example, Labelle et al. (1990) found that 45 % of the their high as well as 46% of the medium high hypnotizables reported pseudomemories. In that study, hypnotizability and imagery predicted significant variance on memory creation item. And people who had high scores on both measures were most likely to report the pseudomemory. Low hypnotizables, even when they reported a preference for imaginal experiences, did not report such memories.

Some investigators suggested that hypnotizability, and not hypnosis *per se*, is associated with false memory reports (McConkey, Labelle, Bibb & Byrant, 1990; Spanos, Gwynn, Comer, Baltruweit & de Groh, 1989; Barnier & McConkey, 1992). For example, McConkey et al. (1990) suggested a false memory to high and low hypnotizable subjects, either in hypnosis or waking conditions. Subjects' reports of pseudo memory were tested four times: First when they were with the experimenter, twice with another experimenter, and on the fourth time they were contacted away from the laboratory by a third experimenter. While the pseudomemory reporting did not differ significantly in the laboratory settings, it declined in the fourth testing (away from the laboratory) when they were contacted by the third experimenter. Subjects reported a similar number of false memories, in the hypnosis and waking conditions. Also, more high than low hypnotizables in both hypnosis and waking conditions accepted the suggestion for a false memory, and reported the false memory when tested by an independent experimenter.

According to Spanos, Gwynn, Comer, Baltruweit and de Groh, 1989, high hypnotizables' reports of pseudomemory are more affected by leading questions and contextual variables. They argue that hypnotic pseudomemory reflects a "bias" in subjects' reporting rather than an irreversible integration of original and suggested memory. In their study, Spanos et al. showed high

and low hypnotizables a video tape of a simulated armed robbery. One week later, subjects were shown a simulated newscast of a suspect being arrested by the police. In the third session, one week later, subjects were questioned, under either hypnotic or non hypnotic conditions, about eight characteristics of the suspect but not the offender. Results showed that a similar number of subjects misattributed some characteristics of the suspect to the offender in the hypnotic and non hypnotic conditions. However, across both conditions, high hypnotizable subjects were more likely to misattribute characteristics of the suspect to the offender than low hypnotizable subjects. In cross examination, designed to break down false memory reports, the same number of hypnotized and non hypnotized subjects rejected their reports.

Another study by Barnier and McConkey (1992) investigated the hypnotic effect on reports of false memories in 30 high and 30 low hypnotizable subjects. Subjects were shown slides that depicted a purse snatching involving an offender, a victim, and another passerby. Subjects were then assigned either to the hypnosis or the control condition, in which the subjects were given a puzzle task. The experimenter told subjects to return to the beginning of the session when they were carefully watching the interesting slides and told them they would start seeing the slides again in their "mind's eye". Subjects were asked to look closely and describe the offender (test 1), after which the experimenter presented three suggestions in one of three orders, that the offender had a mustache (true), wore a scarf (false), and picked up flowers (false). Memory was tested after the suggestion by another experimenter during an inquiry session (test 2), and again by another experimenter in an informal interrogation (test 3).

The results of this study suggested that hypnotizability was the major predictor of subjects' false memory reports. Highs reported memory of the

two false items more often than low hypnotizables in both conditions. Nevertheless, hypnotizability was not relevant for the true item (mustache suggestion). Both high and low hypnotizable subjects showed a drop-off in their reports of the mustache after the inquirer's shift in the context of testing, indicating that faulty memory can occur for both a suggested real event and a suggested false event. The authors argued that the subjects' reports of the false items were no more or less fixed in memory than the real one. Also, hypnotizability was not relevant in the informal inquiry setting (test 3), where both low and high hypnotizables showed similar memory changes. The most dramatic memory change occurred after the inquirer shifted the context of testing. In the informal setting, the experimenter pretended that the experiment was over, and told subjects that the items may or may not have been present in the slides. When the context of memory test was shifted, most of the subjects, (particularly high hypnotizables) who have reported the items in test 2, changed their reports. When subjects' confidence in their memory reports was assessed during posthypnotic inquiry, neither condition, nor hypnotizability was relevant to subjects' confidence. The authors suggested that subjects' hypnotizability and social psychological factors are critically at work in pseudomemory reporting.

#### The Hidden-observer Phenomenon

At this point, it is useful to present some of the theoretical conceptualization of the HO phenomenon, and to summarize some of the studies relevant to it. This phenomenon was discovered accidentally in the mid 1970s, when E. Hilgard was demonstrating hypnotic deafness to his undergraduate students (Hilgard, 1992). As mentioned before, the hidden-observer experiments were cited primarily in support of Hilgard's dissociation

formulation. Most of these experiments used only high hypnotizable subjects in a context of hypnotic analgesia, or of hypnotic deafness and blindness.

Before going further, it will be useful to give an example of a typical experiment of hypnotic analgesia, from which evidence of the hidden-observer phenomenon is derived. Subjects are exposed to a baseline pain stimulation trial (e. g., immersion of hand in ice-cold water for 60 seconds). At set intervals, during the trial, subjects give verbal ratings of pain intensity. Afterwards, subjects are given a hypnotic induction and the analgesia suggestion. After pain reports for the analgesic condition is taken, the hidden-observer instructions are administered. Hilgard's original instructions were as follows:

You know that when you are hypnotized, you can have many experiences that lie outside of ordinary reality. You can fail to smell or hear things that are actually there; you can have the experience of feeling much younger than you are, and so forth. While you are having these experiences, you are unaware of ordinary reality, for example, when you forget things in hypnosis that you ordinarily remember very well. The experiences in hypnosis are real; yet, even at the time you are hypnotized and experiencing these things, there is some part of your mind, a hidden part, that knows what is going on, your body knows in some way what is happening to it when it is stimulated. Many regulators of the body processes are involuntary, not represented fully in awareness, like heart rate or blood pressure, or temperature control. Correspondingly, there are aspects of what is going on when you are deeply engrossed in hypnotic experience that are unknown to you, but part of you is still registering what is happening.

When I want to speak with this hidden part of yourself, I will place my hand on your shoulder, Like this (demonstration). When I place my hand on your shoulder I will be in communication with this hidden part, and we can talk together; but the hypnotized part of you, the part to whom I am talking now, will not know that you are talking to me. It will not know what you are saying, or even that you are talking. When I then remove my hand from your shoulder you will be back in the hypnotic state you are now in, and you will not know what you said or even that you were talking to me. You will forget all about it until I say, after you are out of hypnosis: Now you can remember everything about the hidden part of yourself, what you said when I had my hand on your shoulder, and how you felt during the experiment when the events we talked about were taking place. Until then, however, everything will be as it was before I placed my hand on your shoulder, and you will forget everything that the hidden part of you revealed. Is this all clear?

The hypnotist then places his hand on the subject's shoulder and tells him the following:

I am placing my hand on your shoulder so that I can get in communication with the hidden part of you that knows everything that has been happening. Today your hand and arm were placed in the water following the suggestions of numbness. Do you remember now the highest pain that you reported?

During hypnotic analgesia testing, these subjects give overt (verbal) reports that indicate the degree of pain experienced by their "hypnotized part", and hidden reports (numbers tapped out by previously taught key-pressing). The hidden reports supposedly reflect the pain experienced by the "hidden part". Many of these subjects report a normal level of hidden pain that is not reported by the analgesic hypnotized subject (overt report).

According to Hilgard, the hidden-pain reports do not result from suggestion or from experimental demands; Rather, they reflect a dissociative process. On this view, analgesic subjects experience high levels of pain even though the pain remains out of awareness. The hidden part is supposed to be more logical and reality oriented. Hilgard introduced the metaphor of the hidden-observer as a convenient way to describe a memory structure based on information that a person had registered and stored in memory, without being aware that the information had been processed. Nevertheless, this metaphor has been used by some clinicians to talk to the unconscious in the form of an "inner advisor", and in experimental settings by what is called the hidden-observer experiments.

One of the interesting aspects of hidden-observer reports is that they can be shaped by situational demand characteristics. One of the criticisms of the HO structure, as administered by Hilgard, is that it directs subjects to respond to expectations conveyed by the HO instructions. Spanos challenged the notion that the hidden observer represents a parallel, unconscious, more logical, and reality oriented level of information processing. He suggested that the subjects' ratings of pain and reports of experiencing a "hidden part" stem from their interpretation of the instructions used in the hidden-observer

experiments. Spanos and Hewitt (1980) exposed eight highly hypnotizable subjects to the procedures used by Hilgard for eliciting hidden reports during hypnotic analgesia. Subjects were told that their hidden part would continue to feel high levels of pain. Eight additional subjects were given the opposite suggestion (the hidden part would feel less pain than the hypnotized part). Results showed that subjects expecting higher levels of pain reported high levels of "hidden pain", whereas those expecting little "hidden pain" reported low levels. The authors found the results inconsistent with the notion that the hidden-reports reflect the activity of a dissociated part; Rather, they argued that the results indicate that hidden-observer responding is goal-directed action shaped by the demands conveyed in the hidden-observer suggestion.

The dissociation perspective views memory as a storage, and consequently, memory can be accessed and retrieved by using certain procedures and techniques, such as age regression and the hidden-observer. In contrast, the conceptualization of memory as a reconstructive process, and the notion that memory is malleable, as argued by Bartlett more than 60 years ago, are the ones supported by recent research findings. Therefore, as a process, memory constructions should be influenced by both individual variables (e. g., motivation, imagery, beliefs, and perceptions) and contextual variables (e. g., expectations, and social pressures). Consequently, there is no way to separate the true elements of a memory from the constructed ones.

Both the sociocognitive and the synergistic models acknowledge the important roles of individual and contextual variables. Thus, their views could be easily reconciled with the idea of memory as a process and not as a structure. Nevertheless, the main difference between these two models can be seen as a difference in emphasis and not of conceptualization. That is, the sociocognitive model emphasizes the contextual and social variables. The



individual variables are conceptualized in terms of skills that subjects have in varying degrees, which can be harnessed to produce the hypnotic behaviors. In contrast, the synergistic model puts equal emphasis on both individual and contextual variables in shaping hypnotic responses. Accordingly, this model assumes that subjects would respond differently despite similar contextual and social influences. To illustrate, the sociocognitive conceptualization of the HO suggestion is that it is mainly a demand to report information to which subjects comply. Thus, it could be experienced by a wide range of the population in a variety of situational and motivational contexts. In contrast, the synergistic model assumes that only subjects with certain characteristics (such as high hypnotizability and duality in age regression ) would respond to a HO suggestion .

The different emphases and conceptualizations of the HO phenomenon has led to some confusing controversies. One of the controversies concerns the rates of responding to the hidden-observer suggestion. On one hand, studies by Laurence and Perry (1981), using the same procedure as Hilgard (the hidden-observer for hypnotically produced analgesia) found hidden-observers in only 39% of their highly hypnotizable subjects. Also, they demonstrated a strong relationship between the hidden-observer reports and reports of duality in age regression. When regressed to age five, subjects who responded to the hidden observer suggestion were the same ones who showed duality in age regression. Nogrady, McConkey, Laurence and Perry (1983), replicated these findings, using the real-simulating paradigm to control for demand characteristics. Five of their 12 high hypnotizables displayed the HO and duality in regression, none of the 10 high-medium or the 10 low hypnotizable subjects simulating hypnosis showed the hidden-observer. In this experiment, the reports of subjective experience of dual levels of

awareness during hypnosis was obtained from subjects in a post hypnotic interview.

On the other hand, studies by proponents of the sociocognitive model have reported high rates of HO responding, up to 80 - 95% across all hypnotizability levels (Zamansky, & Bartis, 1985; Lynn, mare, Kvaal, Segal, & Sivec, 1994; Maré, Lynn, Kvaal, Segal, & Sivec, 1994). For example, in their first two studies, Maré et al. (1994) gave their subjects a suggestion for a hypnotic dream then the following HO suggestion:

(You might not have known this before, but there is a hidden part of yourself that is always present and that is always aware of certain things you otherwise might not notice, or things that you might tend to forget or ignore. Under hypnosis you can get in touch with this part of yourself, with your unconscious mind, and you may be surprised to discover new things, new images or new thoughts, that you did not notice before. Just take few moments to allow yourself to get in touch with this part of yourself, with your unconscious mind that is hidden but aware of many more things than you usually are. And as you do this, you may have new thoughts, new images that might be related to your dream, or that may not be related to the dream, but to something else. Take few moments to allow these new thoughts and images to emerge in your mind, as you get in touch with that part of yourself which is your unconscious mind... When that happens, let the index finger of your hand lift up, so that I will know that you have new images.

This suggestion was passed easily by 93% of the virtuoso, 94% of highs, and 78% of medium hypnotizables. In their second experiment, 94% of simulating subjects also reported hypnotic dreams and a hidden-observer. The third experiment examined the hidden-observer in a context of age regression. Preliminary data with 29 subjects indicated that the majority of high hypnotizables passed the suggestion, as did 75% of the medium hypnotizables. Furthermore, non hypnotized subjects who received muscle-relaxation instructions were as responsive to the age regression and the hidden-observer suggestions with frequencies that were comparable to subjects who were hypnotized with the Stanford Scale Form C. The authors suggested that hidden-observer instructions can be used to ensure personally

meaningful information from both hypnotized and non hypnotized subjects in a variety of test situations.

Two points are worth mentioning here. First, the structures and procedures of the HO suggestions used by investigators with conflicting findings were different. While Laurence and Perry (1983) used Hilgard's HO structure (with some modifications) and procedure, Lynn et al. (1994) used different ones. It has been found that the structure of the HO suggestion can influence rates of responding (Nadon, D'Eon, McConkey, Laurence, & Perry, 1988). Thus, the different rates may reflect different demands implied by the different HO structures administered to subjects. For example, the structure of the HO suggestion used by Lynn et al. guaranteed a wide range of responses. Their procedure was to give a hypnotic dream suggestion, then to inform subjects that they can get in touch with their unconscious mind, and that they can "have new thoughts, new images that may be related to their dream or to something else".

In this context, any passing image that comes to the subject's mind, and reported by him/her, was considered a response to the HO suggestion, while it may reflect only a report about what was in the subject's mind at the moment. Furthermore, the structure of the HO, as used by Lynn et al., may be confusing to subjects. That is, it could be understood as an instruction to report, rather than a suggestion to experience. For example, subjects were told to take time to allow thoughts and images to emerge in their mind, and to lift a finger when this happened. This statement is closer to an instruction, and subjects can only fail to respond if they stop thinking. Furthermore, the subjective experience relative to the HO suggestion was not assessed because the authors hypothesized that subjects would experience the HO dispassionately. To pass the hidden-observer suggestion, a subject had only

to raise his/her finger and make a report. It was not clear whether raising the finger reflected an experience of HO, or was simply done to report what came to the subject's mind.

The second point is that the rates of the HO responses reported by Lynn et al. (1994) were assessed in different contexts (hypnotic dreams and age regression), and used subjects from all hypnotizability levels. The rates reported by Hilgard and Laurence et al. (1983) were assessed mainly in hypnotic analgesia and among high hypnotizable subjects only. The rates of HO in hypnotic analgesia may not be applicable, and/or may be different from HO in age regression.

What is important at this point is that the application of the HO suggestion could be influenced by the paradigms and conceptualizations of the experimenters. According to Lynn et al. (1994), the HO suggestion allows subjects to talk about events dispassionately, in other words, it allows subjects to talk about an event with less responsibility. The authors suggested that the HO suggestions can be used productively to enrich therapy, and to facilitate meaningful commentary on important issues. For example, the HO suggestion was used to help clients talk about painful experiences of sexual and physical abuse. The authors also gave examples to demonstrate the usefulness of this procedure in clinical and forensic settings. In one clinical example, the hidden-observer suggestion (in the form of consulting the inner advisor of a client, Deborah) was given in a context of age regression. The inner advisor commented on clinically relevant material, after which Deborah experienced immediate symptomatic relief of anxiety and depression.

In a forensic setting, the HO suggestion was given to a client who was found guilty of sexually molesting his 12-year-old cousin over a one year period, but was amnesiac and could not recall any of the alleged events. To

provide grounds for the reversal of "amnesia", the hypnotist told him that his failure to recall the events may be motivated by the fact that he loved his cousin so much, but that it was possible to access these events in his "unconscious mind" by using the hidden-observer, which can discuss events dispassionately. When the hidden observer suggestion was given, the client gave details of a number of sexual encounters with his cousin, and expressed great relief and remorse for his actions. During this procedure, there was little doubt in the hypnotist's mind that the subject was simulating hypnosis, indicating that it is not even necessary to hypnotize a subject to obtain a hidden report. Nevertheless, the authors recognized the suggestive effects of the hidden-observer, and cautioned against using it with clients whose innocence has yet to be determined.

#### The present study

To expand the application of the HO suggestion to forensic and clinical settings, as suggested by Lynn et al. (1994), may be a dangerous technique that increases the risk of memory creation. A major aim of the present study was to use the HO suggestion for investigating the content of hidden-observer reports in relation to pseudomemories. That is, the influence of HO suggestion on memory creation was tested by comparing information about memories gathered from subjects before and after hypnosis. Subjects were asked to fill in a Personal Memory Questionnaire (PMQ) of common events, and to indicate which of these memories happened to them, to rate their confidence in these memories on a 5-point scale, and to indicate the age for the memories they were confident happened to them. For each subject, a memory was chosen from the ones which the subject had no confidence in. During age

regression, subjects were first asked about the event, then a HO suggestion was administered to comment on it.

There has been ample support for the assertion that event details suggested in hypnosis get incorporated into personal memories, and are then accepted with confidence. None of the studies reviewed have reported a creation of a complete self-involved personal memory in hypnosis. Therefore, this study aims at investigating the probability and the rates of memory creation when the HO suggestion is used. Also of importance for this study, was to test which individual variables (e. g., hypnotizability, imagery, absorption, beliefs about own memory) and contextual variables (e. g., expectations) increase the likelihood of memory creation. Subjects' expectations were manipulated by giving them different instructions about memory before hypnosis. The instructions were representative of beliefs held by lay people and professionals about memory. The first group were given instructions indicating that memory is a structure in the brain, the second group were given instructions indicating that memory is a re-constructive process, and the third group were not given any information (control group). In addition, this study explored the effect of subjects' beliefs about the strength of their own memory on memory creation.

A further aim for this study was to assess rates of hidden-observer responding in age regression to allow better evaluation of the conceptualization of the HO suggestion in this context. The frequency of HO has theoretical implications for understanding this hypnotic phenomenon. While the high rates across all hypnotizability levels may emphasize contextual effects and demand characteristics, low rates among high hypnotizable subjects only, would render the effect of hypnotic condition and

individual characteristics more relevant in producing a hidden observer response.

Based on research findings, it was hypothesized that:

1. The three instruction groups would differ in the rates of memory creation, demonstrating the role of subjects' expectations on memory production. That is, subjects in the group receiving instructions that memory is recorded faithfully in the brain and that people usually can remember better under hypnosis would expect to remember more. Consequently, it was expected that they would have more tendency to create the memories they were asked about. The group which received instructions warning them that people tend to mix suggestions with actual memories, were expected to be more careful, and to have less tendency to create memories.

2. Subjects who thought they had a good memory were expected be more resistant to memory creation than subjects who thought they had a weaker memory.

3. Confidence in the false event was predicted to increase, across all groups, after the hypnotic experience.

#### Note about the hidden-observer

The HO structure used in this study was similar to the one used by Lynn et al. (1994), but with some modifications to suit the purposes of this study. The HO suggestion used in this study capitalized on the idea of a hidden, "unconscious" part, coupled with an unambiguous demand to comment on a specific event chosen for each subject. Thus, it was not conducive to subjects reporting random thoughts or images that came to their minds. Therefore, we used Hilgard's original procedure of putting the hand on the subject's shoulder to get in touch with the "hidden part" instead of

lifting the finger when subjects were ready. However, subjects were given the choice of responding to the HO suggestion or not; That is, after subjects were informed about the hidden part, they were told that may be this other part would be able to comment on the event. This procedure was thought as a direct procedure of the HO suggestion, and it was thought to reduce confusion between suggestions and instructions. A pilot study using three subjects from the lab indicated that this procedure reduced strong demands for reporting, and was less confusing for subjects.



## Methods

### Subjects

A sample of 45 subjects (23 males, 22 females), aged 18 to 39 years (mean = 23 years), volunteered for this experiment. Twenty-one of these subjects were recruited from psychology classes at Concordia, 18 subjects through a notice placed in the student's journal "The Link", and 6 subjects were students at McGill University, who were interested in participating in a hypnosis experiment. Subjects were screened for hypnotizability level using the "Harvard Group Scale of Hypnotic Susceptibility"; Form A. (HGSHS: A; Shor & Orne, 1962).

### Material

A battery of questionnaires was administered to all subjects in the first session. This battery consisted of the following :

Personal Memory Questionnaire (PMQ): A list of 25 events that frequently occur during childhood. Subjects were asked to indicate if any of these memories happened to them, and to rate their confidence on a 5-point scale to indicate the degree of confidence that an event happened to them between age 1 and 10 years old. A score of (+2) indicates that the subject was very sure that this event happened to him/her, and a score of (-2) indicated that the subject was very sure it did not happen. A score of (0) meant "I don't know". Subjects were also asked to write the age at which the event had happened if they were sure of it (Appendix A).

Differential Personality Questionnaire: (DPQ) Scale "Ab" (Tellegen, 1980, 1982):

The DPQ is the most widely used scale for measuring absorption ability. Absorption is defined as a disposition, penchant or readiness to enter states characterized by marked cognitive restructuring, and as readiness to depart from more everyday life cognitive maps and to restructure (Tellegen, 1979). This scale consists of 34 statements to be answered in a true-false mode (see Appendix B). The subject's score is the number of true statements. Tellegen and Atkinson (1974) reported correlations of .27 and .42, based on two different samples of subjects, between the absorption scale and hypnotizability. Coefficient alpha for internal validity for this scale is .89 (Isaacs, 1982).

Individual Differences Questionnaire (IDO): (Paivo, & Harshman, 1983) :

This scale measures imagery. It is composed of items tapping three different factors: Habitual use of imagery (13 items), use of images to solve problems (two items), and vividness of dreams, day dreams and imagination (six items). Subjects rate each statement as to how characteristic it is of their way of thinking. A 5-point Likert type scale is used with anchors of extremely characteristic (+2), or extremely uncharacteristic (-2). See Appendix C.

Auto-Biographical Memory Questionnaire (ABMQ): (Conway, 1994):

The ABMQ is a validated self report measure of memory strength. It consists of 21 statements that describe different levels of memory strength. Subjects rate their agreement with each statement on a 5-point Likert type scale with anchors of (1) for strongly disagree, and (5) for strongly agree. High scores on this questionnaire indicate better memory (Appendix D).

Harvard Group Scale of Hypnotic Susceptibility; A (HGSHS:A); (Shor & Orne, 1962).

The purpose of this scale is to introduce subjects to the hypnotic experience, and to evaluate their level of hypnotizability. A tape recorded version of this scale, that lasts 45 minutes, was administered to groups of 8 to 10 subjects. The "HGSHS:A" consists of 12 items varying in difficulty (induction and 11 suggestions). After the session is finished, each subject reports if each of the items is passed or not. The item is passed if the subject score on that item indicates that the subject had the subjective feeling of whatever was suggested. For example, for the hand lowering item, the subjects are given a suggestion that their hands become heavy and start to go down. If the subject felt that his/her hand felt very heavy and that it went down all the way, the item is scored (A). Each subject is assigned a score that is the number of the (A) items (scores range from 0 to 11).

### Procedure

#### The screening session

Subjects were contacted by telephone, and assigned to one of the group sessions for hypnotizability screening. On their arrival at the lab, subjects were asked to read and sign a consent form (Appendix E). After that, the paper-and-pencil questionnaires indicated above were distributed and filled out by each subject. The Harvard Group scale (HGSHS: A) was administered immediately after the paper-and-pencil inventories. After collecting the data, subjects were thanked for their participation, and they were asked if they were willing to participate in the second session.

Subjects were randomly assigned to the three experimental groups before scoring the questionnaires. Thus, the hypnotist remained blind to the hypnotizability level and to the other scores of subjects.

#### The experimental session

There were three experimental groups, each receiving different information about how memory functions:

The first group was told that in our every day life, we tend to forget things that happen to us, but regardless of that, these events are registered faithfully by our mind. Under hypnosis, people usually can remember events that they can't during their wakeful state.

The second group was told that memory is not like a tape recorder, it is a reconstructive process, and sometimes especially under hypnosis we may mix imagined suggestions as part of our actual memory.

The third group did not receive any information.

All hypnosis sessions were audio taped, with subjects' permission. Prior to hypnosis, each subject was told the information assigned to his/her group. In this session, each subject was administered four items of the Stanford Scale for hypnotic susceptibility, which included a relaxation and the following suggestions: Hand Lowering, Hands together, Age regression and the hidden-observer, and Arm rigidity, in that order (Appendix F). For the age regression item; two events were chosen in advance from the Personal Memory Questionnaire (PMQ) of each subject. The first event was chosen from the ones scored (+2) by the subject indicating "very sure happened" to him/her at a specific age. The second event was chosen from the ones scored (0), indicating "I don't know". If the subject's scores on the PMQ did not have any (0) scores, one of the events scored (-1, or -2) indicating "sure, or very sure did not happen" was chosen.

To assess the rates of the hidden-observer responding during age regression, each subject was age regressed to the time of the first memory and asked to describe it. After that, the following hidden-observer suggestion was given :

(You might not have known this before, but there is a hidden part of yourself that is always present and that is always aware of certain things you otherwise might not notice, or things that you might tend to forget or ignore. When in a little while... I place my hand on your shoulder... like this (demonstration), I will get in touch with this part of your self, with your unconscious mind, and you may remember new details about this event that you did not remember before or you do not remember now. And when I'll place my hand on your shoulder for the second time, you will be right back where you are now... deeply hypnotized... Now take a few moments to go deeper... (pause). I'm placing my hand on your shoulder now, and may be that other part of you would be able to comment in some way on this event. ... (pause).

After the subject's response (or no response), the hidden-observer suggestion was canceled as follows:

(All right, now as I told you before, I am placing my hand on your shoulder a second time... and things are as they were before... right back where they were before I touched your shoulder the first time... you are deeply relaxed... deeply hypnotized).

After canceling the hidden-observer suggestion, the pseudomemory item was introduced to the subject by asking him/her about the second memory (scored 0 on PMQ). Each subject was asked if he/she remembered the event, and an age was suggested for this event by the experimenter (e. g., "I would like to ask you about an event that may or may have not happened to you when you were five years old. Do you remember falling down the stairs and hurting yourself?"). If the subject answered "yes", he/she was age regressed to the time of memory, then asked to describe what was happening, followed by the hidden-observer suggestion (as before). If the subject said "No, I don't remember", he/she was told "that's Ok, sometimes it takes more time to remember, let us go back to that time", then the subject was age regressed to the suggested age, and the HO suggestion was given. After gathering information, the hidden-observer was canceled in the same manner

as before. Then the subject was brought back to the present, and hypnosis was terminated. The session lasted approximately 45 - 50 minutes for each subject.

Immediately after the session, an informal posthypnotic interview was conducted (10 - 15 min.) to gather information about the "subjective involvement" relevant to age regression and the hidden-observer. First, subjects were asked to describe their hypnotic experience during age regression, followed by standardized questions that were asked to all subjects (see Table 1). After that, subjects were asked to fill in the (PMQ) and to rate their confidence in memories as they did before. Finally subjects were thanked for their participation.

### Scoring

A dual criterion of the experimenter's evaluation and the subject's experience during age regression was used to score different items of subjects' performance. In addition, memory creation, duality in age regression, and the hidden-observer reports for 40 subjects were rated by two judges, the experimenter and another graduate student who was naive to the subjects' experimental conditions. The interrater agreement was very high (90% to 100%), so the last five subjects were rated by the experimenter only.

### Scoring the Memory Creation variable

Memory creation was determined by evaluating subjects' responses to the second memory only (rated 0, -1, or -2). The memory creation item was scored "pass" if a memory report was obtained, and scored "fail" if the subject did not report the memory, and/or if he/she reported a different memory. Interrater agreement for passing the memory creation item was 100%.

### Scoring Duality and Age regression

The age regression item was passed if the subject reported having the feeling of being like a child during age regression (see Table 1, question number 3). If the subject did not feel like a child and reported that it was like imagining or remembering, he/she failed the item. After passing the age regression item, Duality was passed if the subject reported having both the feeling of being like a child and a feeling of his/her adult identity, either simultaneously or in alternation (questions 3, 4, and 5). Interrater agreement for this item was 90%.

### Scoring the Hidden-observer

Each hidden-observer report was scored twice, once according to a strict criterion, and once according to a loose criterion:

The strict criterion required subjects to pass both the age regression item and the duality item during age regression, and to give a report after the HO suggestion. The subjective experience of duality was considered important for two reasons: Firstly, the association between the hidden-observer and duality is supported by many studies in the literature. Secondly, the hidden observer metaphor capitalizes on the existence of another part that processes information independently of the subject's awareness, that is, dual levels of consciousness. Thus the subjective feeling of the two identities would reflect a hidden-observer report more than just a response to demand characteristics to report more information, which is also implied by the HO suggestion.

The loose criterion was dependent on the subject's performance only. That is, the subject received a score of 1 = pass, for any report after the hidden observer suggestion was administered, regardless of his/her subjective

Table 1: Standardized Questions from the Post Hypnotic Interview.

- 1) Describe to me what happened during age regression.
- 2) Describe to me what happened when I asked for your hidden part.
- 3) During age regression, did you really feel like being the child, or was it like imagining?
- 4) Did you have any sense of being there?
- 5) Did you have any feeling of your adult identity?
- 6) Do you feel you remembered more under hypnosis?
- 7) Did you feel anything when I placed my hand on your shoulder?
- 8) Were you able to remember more things with the hidden-observer?
- 9) What happened when you were asked about the second memory?
- 10) Did you have any feelings of being compelled to answer.
- 11) Did the memories come spontaneously, or you had to put an effort to find them?
- 12) How confident are you that these memories happened to you.



experience. Thus, each subject had four scores for the two HO suggestions that were administered for the two memories (2 strict x 2 loose).

In addition, each subject had another two global scores, one strict and one loose. Not all subjects responded to both HO suggestions, some responded to the first but not the second, and visa versa. Thus a global score of pass was given to any subject that responded to either HO suggestion or to both, and a score of fail to subjects who did not respond to any of the two HO suggestions. Interrater reliability for the strict hidden-observer was 90%, and for the loose 100%.

### Cognitive effort

Cognitive effort was evaluated by subjects' answers to question number (11) during the posthypnotic interview (Table 1). The subject was given a score of (0), if he/she reported that the memory came to him/her spontaneously, and a score of (1) if he/she had to make an effort to remember or construct the memory. Interrater agreement for this item was 100%.

## Results

As mentioned before, subjects' scores on the HGSH:A were in the low-medium range (scores of 0 - 8). Unfortunately, no high hypnotizables were found in this sample; the highest score obtained in this study was (8), which falls within the medium-high range. Means and standard deviations for all subjects' scores on all the variables are presented in Appendix G. The obtained correlations between imagery, absorption, amnesia, and hypnotizability were similar to correlations reported in the literature for similar samples (see Appendix H).

For each group, the means and standard deviations for subjects' scores on each of the dependent measures (IDQ, DPQ, ABMQ, and HGSHS:A) are presented in Table 2. A one way Analysis of Variance (ANOVA) was performed on each of these measures, with the Instruction Groups as the independent variable. None of these analyses was significant, indicating that the groups did not differ on any of the measures (see Appendix I for analyses).

### Memory Creation

As explained before, the creation group was the group of subjects who passed the memory creation item ; That is, subjects who reported the second memory during age regression. The no-creation group was the group of subjects who failed the memory creation item, and did not report the second memory. Each subject was asked about a memory that he/she had no confidence in (scored 0, -1, or -2, on the PMQ). Out of the 45 subjects in the three instruction groups, 19 subjects reported the memory (42.2%). It was hypothesized that the three instruction groups would differ in the rates of memory creation, demonstrating the role of subjects' expectations on memory

Table 2. Means and Standard Deviations for the Three Experimental Groups on Four Dependent Measures.

<u>Variables</u>	<u>Group 1</u>		<u>Group 2</u>		<u>Group 3</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
DPQ	21.40	06.20	20.80	05.14	22.33	04.95
IDQ	21.45	08.80	18.53	09.95	23.86	04.95
ABMQ	66.80	16.76	69.60	10.99	66.20	16.71
HGSHS	04.66	02.89	04.20	01.99	04.60	02.84

Note.

DPQ = Differential Personality Questionnaire

IDQ = Individual Differences Questionnaire

ABMQ = Autobiographical Memory Questionnaire

HGSHS = Harvard scale for hypnotic ability

production. To test this hypothesis, a chi-squared test was performed on the frequency of memory creation among the three groups. A non significant chi square [ $\chi^2 (2, N = 45) = 1.00, p \geq .05$ ], indicated that the difference among the three groups was not significant beyond chance level. Thus, this hypothesis was not supported.

### Prediction of memory creation

Analyses were conducted to determine if any of the variables that were measured by questionnaires (Hypnotizability, imagery, absorption, and memory strength), or performance variables (duality, hidden-observer, and cognitive effort) were related to memory creation. Logistic regression was the statistical method used in this section. The goal of logistic analyses is to predict category outcome for individual cases. For example, after the relationship between the outcome and the set of predictors is established, the outcome for a new case is predicted on a probabilistic basis. Logistic regression allows the prediction of a discrete outcome such as group membership (e. g., creation, no-creation) from a set of variables that may be continuous, discrete, dichotomous, or a mix (Tabachnick, & Fidell, 1996). For example, can memory creation (pass or fail) be predicted from hypnotizability, duality, imagination, and absorption? Logistic regression is a flexible method that has no assumptions about the distributions of the predictor variables. That is, predictors do not have to be normally distributed, linearly related, or of equal variance within each group. .

Research findings have shown a relation between memory creation and some of the variables used in these analyses (e. g., hypnotizability). But there are no specific hypotheses about the order or importance of predictors, other than hypnotizability. Thus, the direct logistic regression, in which all

predictors enter the equation simultaneously, was used to test whether these variables contribute to the prediction of memory creation. This method allows evaluation of the contribution made by each predictor over and above that of the other predictors. By comparing a constant-only ( (intercept-only) model with a model that has the constant plus the predictors, a reliable difference between the full model and the constant- only model at a level  $p < .05$  indicates that the predictors contribute to the prediction of outcome. If no improvement is found when the predictors are added, the predictors cannot be said to be related to the outcome

All analyses mentioned in this section and the following ones were performed using the SPSS program . Data screening revealed no outliers on any measure. Therefore, data from the 45 subjects were available for analysis. There were 19 subjects in the memory creation group and 26 subjects in the no-creation group. A direct logistic regression analysis was performed on memory creation as an outcome and hypnotizability as a predictor. A test of the model with the HGSHS:A as a predictor against a constant-only model was not statistically reliable [ $\chi^2 (1, N = 45) = 3.191, p = .07$ ], indicating that hypnotizability, by itself, cannot reliably predict memory creation. Nevertheless, this model did predict the responses of 84.62% of the subjects in the no-creation group, and 42.11% of the subjects in the creation group, for an overall success rate of 66.11% (see Appendix J for analysis of this section).

A second run with memory creation as the outcome, and measures on the four questionnaires (IDQ, DPQ, ABMQ, and the HGSHS) as predictors, was performed. A test of the full model against a constant-only model was also not statistically reliable, indicating that the predictors, as a set, cannot distinguish reliably between subjects who created memories and those who did not. The addition of the IDQ, DPQ, and the ABMQ did not enhance

prediction beyond what was obtained by the Harvard alone. The Wald test in logistic regression is the logistic regression coefficient divided by its standard error. A significant Wald test indicates that a predictor is reliably associated with the outcome. According to the Wald criterion, none of these variables can predict memory creation reliably.

All these questionnaires are continuous variables, and there have been some difficulties associated with the Wald test evaluation of predictors, when the predictors have more than two levels (Tabachnick, & Fidell, 1996). The Wald statistics in SPSS estimates reliability of each degree of freedom separately, but not a discrete predictor as a whole. In this situation, the likelihood ratio (LR test) is considered superior to the Wald test in evaluating the prediction capabilities of these questionnaires as predictors. The LR test evaluates the predictor by testing the improvement in the model fit when the predictor is added, or conversely, the decrease in model fit when the predictor is removed. The difference in the log-likelihood's (the comparison of the frequencies produced by each model to observed frequencies) of the two models produces a chi square calculated according to this equation (Tabachnick, & Fidell, 1996):

\*  $\chi^2 = 2 [(\log\text{-likelihood for the bigger model}) - (\log\text{-likelihood for the smaller model})]$ .

To evaluate the capability of the variable in predicting the outcome, this chi square is evaluated on 1df (the difference between degrees of freedom in the bigger model and the smaller model). A significant chi square indicates that the predictor enhances prediction of the outcome significantly.

A second run to predict memory creation from the same variables, with the HGSHS omitted, was done and compared to the previous model that contains the same components including the HGSHS. The difference in the

log-likelihood's of the two models produced a significant chi square of - 5.34 (df, 1;  $p \leq .025$ ), indicating that hypnotizability significantly enhances the prediction of memory creation when added to the other predictors. When the same procedure was carried out to evaluate each of the other variables (IDQ, ABMQ, and DPQ), no significant decrease in prediction for any of them was obtained.

The performance variables (duality, hidden-observer, and cognitive effort) fared much better than questionnaires in predicting memory creation. Subjects' responses to the hidden-observer were more consistent according to the strict criterion (see below) than the loose one. Thus, I used the strict criterion in my analyses on this variable. A direct logistic regression, with memory creation as an outcome, and the HOS as a predictor was done. The test of the full model against a constant-only model showed a significant improvement in prediction [ $\chi^2 (1, N = 45) = 10.695, p = .001$ ], indicating that this model can reliably distinguish between subjects in the two memory creation groups. This model had a success rate of 96.15% of subjects in the no-creation group, and 42.11% of subjects in the creation group correctly predicted, for an overall success rate of 73.33%. The Wald criterion indicates that the hidden-observer, by itself, reliably predicted memory creation at  $p = .009$ .

A second run tested duality as a predictor of memory creation, against a constant-only model. This model showed a significant improvement in the prediction of memory creation [ $\chi^2 (1, N = 45) = 5.59, p = .018$ ], indicating that this cognitive style can distinguish reliably between the two groups of memory creation. This model predicted the performance of 88.46% of no-creation subjects, and 42.11% of creation subjects correctly, for an overall

success rate of 68.89%. The Wald criterion indicates that duality is also a reliable predictor of membership in these groups at  $p = .025$ .

A final direct logistic regression analysis of memory creation as a function of the three predictors (HGSHS, duality, and cognitive effort) was conducted. The first two variables have some theoretical support and showed associations with memory creation in the previous analyses. Cognitive effort was added to these variables to test its contribution to the prediction of memory creation, and the hidden-observer was omitted because of its correlation with duality (duality was a criterion of HOS). A test of the full model with the three predictors against a constant-only model was statistically reliable [ $\chi^2 (3, N = 45) = 12.695, p = .005$ ], indicating that the predictors, as a set, can predict memory creation reliably. This model was able to predict 80.77% of subjects in the no-creation group, 63.16% of subjects in the creation group correctly, for an overall success rate of 73.33%. The regression coefficients, Wald statistics, partial correlations, and the odds-ratios for each of the three predictors are shown in Appendix I. According to the Wald criterion, cognitive effort reliably predicted memory creation ( $p = .03$ ), with an odds-ratio of 6.7, indicating that subjects who actively tried to remember were more than 6 times, more likely to create the memory, than subjects who did not make such efforts. The HGSHS almost reached significance ( $p = .059$ ) according to the Wald criterion, with an odds-ratio of 1.34, indicating a 34% increase in the likelihood of creating memory for each one unit increase on the Harvard scores. Also, the Wald criterion for duality was almost significant ( $p = .058$ ), with an odds-ratio of 5, indicating that a person with this cognitive style is five times more likely to create memories than a person who does not have it.



To further test the reliability of duality in predicting memory creation, another run for the same variables, with the duality variable omitted, was conducted. The difference in the log likelihoods of the two models was found significant [ $\chi^2(1, N = 45) = 7.97, p \leq .005$ ], further confirming that duality reliably enhances the prediction of memory creation. Interestingly, the smaller model (without duality) was still statistically reliable [ $\chi^2(2, N = 45) = 8.71, p \leq .013$ ], indicating that the HGSHS and cognitive effort reliably contribute to the prediction of memory creation. The Wald statistic for this model indicates that both the HGSHS and cognitive effort can reliably distinguish between subjects in the two creation groups, with 76.92% of subjects in the no-creation, and 47.37% of subjects in the creation groups correctly predicted, for an overall success rate of 64.44%. From these analyses, it seems that hypnotizability, duality, and cognitive effort are the factors which most reliably predict memory creation.

#### The hidden-observer, duality, and memory creation

The association between the hidden-observer and memory creation is shown in Table 3. As can be seen from this table, out of the 9 subjects who passed the HO suggestion, 8 subjects reported the memory (88.88%), and only one subject did not. Nevertheless, memory creation does not seem to be limited to those subjects who passed the HO suggestion, 11 subjects who did not meet the criterion also reported the memory. The association between duality and memory creation is shown in Table 4. Out of the 11 subjects who experienced duality during age regression, 8 subjects (72.7%) created the memory.

The memory was created by asking the subject if he/she remembered an event (the second memory) that may, or may have not, happened to

Table 3. Contingency Table for the Frequency of Memory Creation and the Hidden-observer Responses.

		<u>MC</u>	
		<u>Fail</u>	<u>Pass</u>
<u>HOS</u>	<u>Fail</u>	25	11
	<u>Pass</u>	1	8

MC = Memory creation

HOS = Hidden-observer, strict criterion.

Table 4. Contingency Table for the Frequency of Memory Creation and Duality

		<u>MC</u>	
		<u>Fail</u>	<u>Pass</u>
<u>Duality</u>	<u>Fail</u>	23	11
	<u>Pass</u>	3	8

Note.

MC = Memory creation

him/her at a certain age suggested by the experimenter. Out of the 19 subjects in the creation group, 7 subjects reported the memory before the hidden-observer suggestion was administered. For example, when the subject was asked "do you remember falling down the stairs and hurting yourself when you were 5 years old?", these subjects answered "Yes", then gave information about the event when age regressed to age five, with more elaboration after the hidden-observer was administered. All seven subjects increased their confidence level in the same memory when they filled in the Personal Memory Questionnaire (PMQ) during the post hypnotic interview. Five of these subjects reported the memory at the same age suggested by the experimenter, the other two subjects reported the memory at a different age.

The remaining 12 subjects did not remember the event when they were asked about it the first time. That is, they answered "No, I don't remember" when they were asked the same question. After that, these subjects were age regressed to the suggested age, then they were given the HO suggestion, after which they reported the memory. Out of these twelve, nine subjects increased their confidence in the memory when they filled in the PMQ, and three subjects did not. That is, these three subjects rated their confidence in the memory the same as they did before hypnosis (0, -1, or -2). Thus, their confidence level in the memory did not change, even though they reported the memory. Out of the nine subjects who increased their confidence in memory, five reported the memory after hypnosis at the suggested age, and four reported the memory at a different age.

To determine whether these two groups of subjects were different on any of the four dependent measures (IDQ, DPQ, ABMQ, and HGSHS), four t-tests for independent samples, compared subjects who reported the memory before with those who reported it after the HO suggestion. The Bonferroni

correction for inflated alpha was used at a corrected level of  $p = .025$ . Significant group differences were obtained for both the IDQ [ $t(13.5) = -5.25$ ,  $p \leq .001$ ], and the DPQ [ $t(16.8) = -3.16$ ,  $p = .006$ ]. In order, means (with standard deviation in parentheses) for the Before and After groups were 10.00 (6.80), 27.50 (7.34) for IDQ, and 18.00 (3.21), 24.08 (5.16) for DPQ (see Appendix K for analyses).

### Memory strength and memory creation

The second hypothesis predicted that the subjects who thought they had a good memory were expected to be more resistant to memory creation than subjects who thought they had weaker memory. In previous analysis, a logistic regression analysis showed that the ABMQ cannot predict memory creation reliably. To further evaluate the contribution of the ABMQ on memory creation, an LR test was done. A direct logistic regression with memory creation as an outcome and the ABMQ and HGSHS serving as predictors, against a constant-only model, was compared to a second run having the same components, with the ABMQ omitted. The chi square for the difference between the log likelihoods of the two models was not significant, indicating that beliefs about one's strength of memory cannot predict memory creation under hypnosis, at least for this group of subjects. Thus, this hypothesis was not supported (see Appendix L for the analysis).

### Confidence in memory after hypnosis

The third hypothesis predicted that the confidence in the created memories will increase after hypnosis. To test this hypothesis, a 2 x 2 x 3 mixed Analysis of variance (ANOVA) was done. The between group variables were: Memory creation (creation, no-creation), and memory

instructions (memory structure in the brain, memory re-constructive process, and a control). The within subjects variable was confidence in the second memory with two levels (before and after hypnosis). Tests of the between subject variables showed a main effect of creation [ $F(1,39) = 25.13, p = .000$ ], indicating that subjects in the memory creation group increased their confidence in memory after hypnosis more than the no creation group. The main effects of group instructions was not significant, indicating that instructions had no effect on the overall confidence in memory. The creation x instructions interaction was also not significant, indicating that memory creation was not different in the three instruction groups. The within-subjects effect of confidence was found significant [ $F(1, 43) = 26.77, p \leq .00001$ ], indicating an increase in the overall confidence in memory after hypnosis. Interestingly, the interaction effect of confidence x creation was also found significant [ $F(1,39) = 41.82, p \leq .00001$ ], indicating that the increase in confidence was different for the two creation groups (see Appendix M for analyses).

Figure 1 shows clearly this interaction effect. Subjects who passed the memory creation item showed a positive increase in their confidence in the memory after hypnosis. For example, a memory that was scored (0, -1, or -2) on the PMQ before hypnosis would be scored (+1 or +2) after hypnosis. In contrast, subjects who failed the memory creation item showed an increase of confidence in the negative direction. For example, a memory that was scored (0) before hypnosis would be scored (-1 or -2) after hypnosis, which means that they became more sure that the memory did not happen to them. Thus, the change in confidence was not limited to subjects who created memories. Unexpectedly, subjects in the no-creation group also showed an increase in confidence, though in the opposite direction.

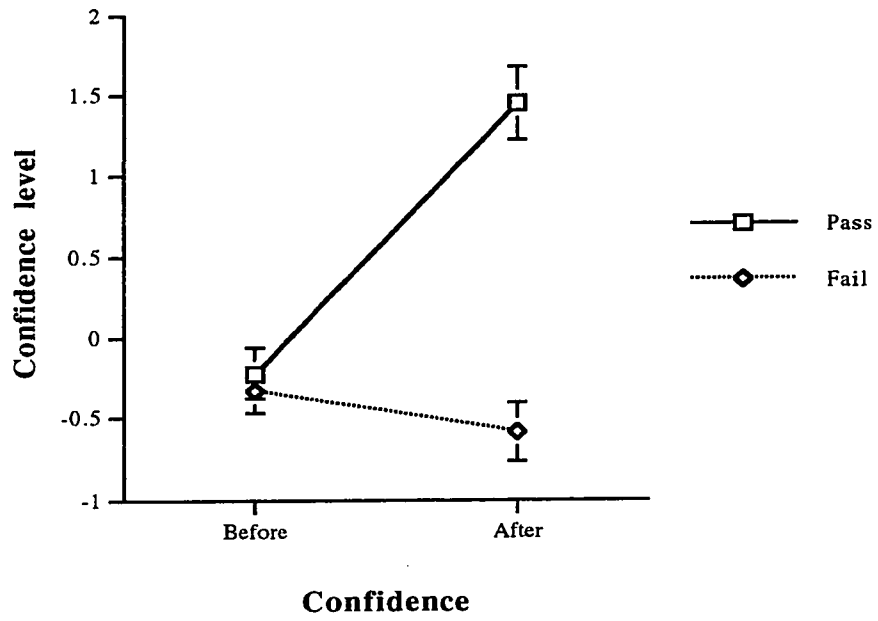


Figure 1. Confidence in Memory for the two creation groups Before and After hypnosis

The interaction of instruction x creation was found non significant, indicating that the memory creation was not significantly different among the three instructions groups. Interestingly, the three way interaction (creation x instruction x confidence) was almost significant [ $F(2,39) = 3.07, p = .058$ ], indicating a possible influence for instructions on the subjects' confidence that is dependent on whether they created a memory or not.

Figure 2 shows this three-way interaction, that is, the change in confidence for the two creation groups. A glance at these graphs shows that subjects who passed the memory creation item from the three instruction groups increased their confidence in memory after hypnosis. In contrast, subjects who failed the memory creation item in the three instructions groups had different patterns of confidence change: The first and second groups were the ones that received instructions about memory before hypnosis, the third group did not have any instructions. The no-creation subjects in both the first and second groups increased their confidence about memory in the negative direction, while subjects in the third group did not.

#### Frequency of Hidden-observer

Unfortunately, this sample of subjects did not have any high hypnotizable subjects (scores 9 -11 on the HGSHS:A). Therefore, I was not able to assess the rates of HO responding for the whole range of hypnotizability. Nevertheless, some observations could be made of the subjects' responses in this sample. As mentioned before, responses to the hidden-observer suggestion were scored according to both a strict and a loose criterion. The strict criterion required that subjects pass both the age regression item and the duality criterion. According to the loose criterion, the subjective experience of subjects was not considered; Thus, any report after



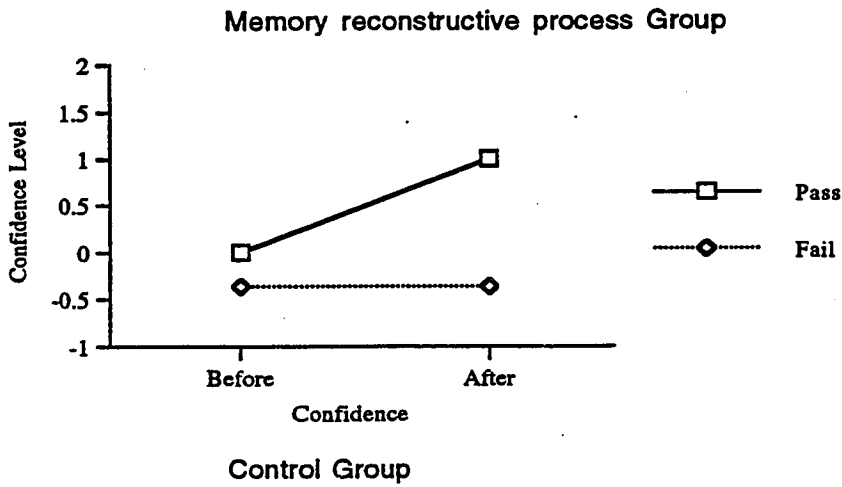
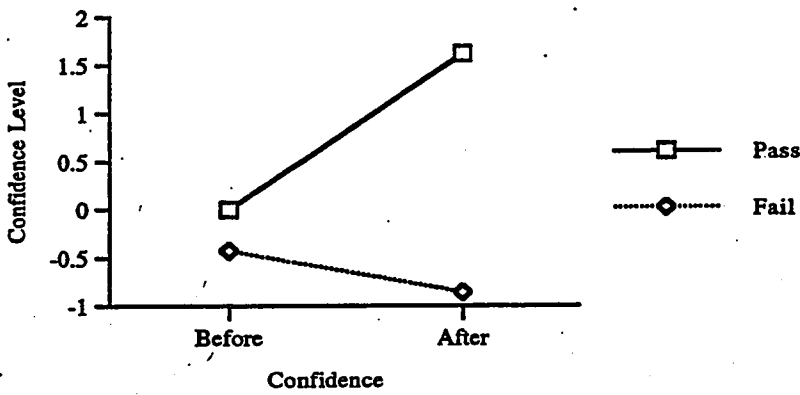
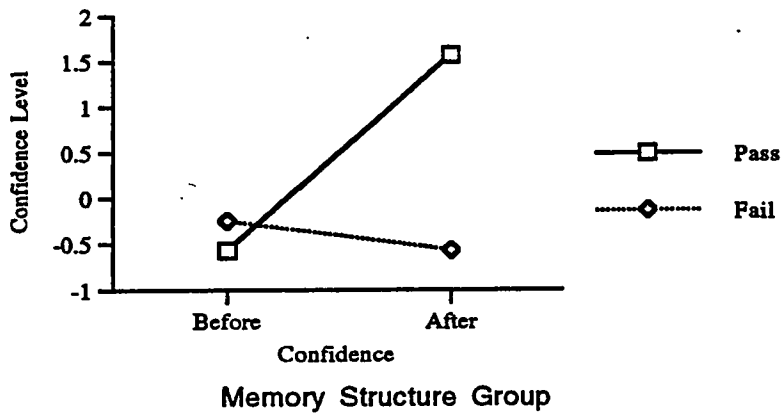


Figure 2. The Three way interaction for Confidence x Creation x Instruction

the suggestion was considered a hidden-observer report. The observed frequencies of the HO according to both criteria are presented in Table 5. The contingency Tables for the frequency of subjects' responses to the two HO suggestions, according to strict and loose criteria, are presented in Tables 6 and 7.

It was noticed that subjects' responses according to the strict criterion were more consistent than the loose one. Seven subjects out of nine responded to both HO suggestions (77.78%), and only one subject responded to either one alone. According to the loose criterion, only 15 out of 29 subjects (51.7%) responded to both HO suggestions. Six of these subjects responded to the first but not the second, and 8 responded to the second but not the first suggestion. Therefore, for the rest of the analyses, I will use the strict criterion (HOS).

#### Prediction of the hidden-observer from questionnaires and performance.

To predict the HO responses, the HO scores for the first memory were used because different demands may contaminate subjects' responses to the second HO suggestion. That is, subjects were asked about events that were rated by them as "I don't know" or "sure did not happen". Therefore, if no HO response was obtained from any subject, it would be hard to know whether the subject is not responding because he/she could not remember the event or because he/she was not responding to the HO suggestion. Thus, responses for the first HO may be a better measure of HO responses.

A direct logistic regression was conducted with the first hidden-observer (HO1S) responses as an outcome variable and the scores on the four questionnaires (IDQ, DPQ, ABMQ, and the HGSHS) serving as predictors. A test of the full model with all predictors against a constant-only model was

Table 5: Frequencies and Percentages of the Hidden-observer Responses to the Two memories, Strict and Loose criteria.

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<u>Hidden-observer</u>	<u>Frequency</u>	<u>Percentage</u>
HO1/S	08	17.8 %
HO2/S	08	17.8 %
HO1/L	21	46.7 %
HO2/L	23	51.1 %
Global HO/S	09	20.0 %
Global HO/L	29	64.4 %

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Note.

HO = Hidden-observer; 1 and 2 = first and second memory

/S = strict criterion; /L = loose criterion.

Table 6. Contingency Table for the Frequency of Subjects' Responses to the Two HO Suggestions (Strict Criterion).

		<u>HO1S</u>	
		<u>Fail</u>	<u>Pass</u>
<u>HO2S</u>	<u>Fail</u>	36	1
	<u>Pass</u>	1	8

Note.

HO1S = hidden-observer responses to the first memory, strict criterion

HO2S = hidden-observer responses to the second memory, strict criterion

Table 7. Contingency Table for the Frequency of Subjects' Responses to the two HO suggestions (Loose Criterion).

		<u>HO1/L</u>	
		<u>Fail</u>	<u>Pass</u>
<u>HO2/L</u>	<u>Fail</u>	16	8
	<u>Pass</u>	6	15

Note.

HO1L = hidden-observer responses to the first memory, loose criterion

HO2L = hidden-observer responses to the second memory, loose criterion

almost statistically reliable [ $\chi^2 (4, N = 45) = 35.876, p = .057$ ]. The model was able to successfully predict 94.44% for the non-responders, 22.22% of the responders correctly, for an overall success rate of 80%. The regression coefficients, Wald statistics, partial correlations, and the odds-ratios for each of the four predictors are presented in Appendix N. The Wald criterion indicates that the IDQ is the only variable that has the capability of predicting reliably the hidden-observer responses at significance level  $p = .024$ . The partial correlation between the IDQ and the HO was negative, indicating that subjects who responded to the HO suggestion had lower scores on the IDQ.

To further confirm the reliability of the IDQ in predicting HO responses, another run for the same predictors with the IDQ omitted was compared to the previous model, which contained all the components with the IDQ included. The difference between the log likelihoods of the two models was found to be significant ( $df, 1; p \leq .025$ ), further confirming that the IDQ enhances reliably the prediction of the HO responses. The success rates for the smaller model (with the IDQ omitted) dropped sharply, with a 0.0% of subjects who responded to the HO, and a 100% of the no-response group correctly predicted, for an overall success rate of 80% (see Appendix N for analyses).

## Discussion

There were three main hypotheses in the present study, with one supported by statistical significance. Each of these hypotheses will be discussed in the present section, with other findings that seem to give some broader context and clarification about both the hidden-observer phenomenon, and pseudomemory. Results are explained within a schema-model framework. In addition the implications of these findings for using the HO suggestion in forensic and clinical settings are further discussed.

### Memory Creation and subjects' expectations.

The first hypothesis predicted a difference in the number of created memories among the three instruction groups, with the expectation that subjects in the first group would create memories the most, and subjects in the second group the fewest. This hypothesis was not supported, the groups did not differ in the number of created memories. These findings suggest that the instructions were not relevant to memory creation. However, an alternative hypothesis would be that the subjects' expectations and anticipations were determined by their original beliefs about memory and hypnosis, and that a simple manipulation of instructions was not enough to overcome the effects of the original beliefs of subjects on their responses. That is, the subjects' original beliefs were the powerful and effective factor in structuring and organizing the subjects' experiences.

Individuals acquire many kinds of schemata or beliefs throughout their lives. These schemata form a basis for organizing behavior in order to interact appropriately with the environment. Thus, schemata function as perceptual sets or miniparadigms, through which people order their lives, and

their responses to the environment. Furthermore, when people try to recall certain events from their childhood, these schemata or beliefs will also guide the re-construction of their past history. As suggested by Ross (1989), the recall of long-term personal events involves an active, constructive, schema-guided process which is influenced by people's knowledge at the time of retrieval. When people fail to recall some information, they make a guess at the past and fill in the gaps. For example, if the subject was asked if he/she remembered falling down the stairs at age five, he/she will ask him/herself, is it possible that I fell down the stairs at that age? He/she will then construct the event by using knowledge relevant to the situation, such as knowledge about his/her childhood house (if there were stairs or not), knowledge scripts of childrens' development and behaviors in general, and probabilities of some incidents that happen to children. They will then put all these elements together in the form of a visual image.

Most of individuals' beliefs are embedded in socio-cultural conceptions (Kelly, 1955). For example, beliefs in memory permanence and beliefs about hypnosis and its ability to enhance recall of past events, among other, are quite common among lay people and professionals. Peoples' beliefs are organized in a hierarchy of schemata, where the beliefs that are relevant to any situation become activated when the person is found in that situation, and guide and structure the individual's perceptions and interactions with the environment. Thus, the beliefs function as *a priori* categories, in that they implicitly guide and structure the subjects' experiences. As suggested by Kelly (1955), people trust their own beliefs, and they remain unaware of these beliefs' influence on their behaviors (e. g., people rarely think about their beliefs about memory or hypnosis when they are in such situations). Thus, the subjects' responses result from the "pre-cognitive" commitments which



structure their beliefs. If they believe in "X", they will experience "X" through the matrix of these formative factors.

Examples of scripts that could be activated during memory recall in hypnosis (as in this study), are a subject's knowledge and beliefs about hypnosis, memory retrieval in hypnosis, and other knowledge scripts relevant to the demands implied in that context. As mentioned before, because the beliefs' operate on an *a priori* basis and because subjects have a pre-cognitive commitment to them, the subjects' anticipations or expectations from the situation will be bounded by their beliefs. Thus, independent of particular instructions received, subjects' expectations would structure their experiences and guide their behaviors, thus biasing their responses in line with their own beliefs.

It is worth comparing this schema-based model to those provided by each of the three theories mentioned earlier. For example, the neo-dissociation theory assumes that during hypnosis some subsystems are directly activated by the hypnotist, leading to a change in the hierarchy of these subsystems. If we accept that those subsystems are the same as the hierarchy of beliefs or schemata, and that the change in the hierarchy occurs automatically in response to the requirements of everyday life, and not only in hypnosis; Then there would be no need to invoke the concept of dissociation to explain hypnotic behaviors. Rather, when the schemata or beliefs that are relevant to hypnosis are activated in a hypnotic context, they become the dominant force for supplying a frame of reference for the subjects' experiences. It should be noted that these structures are not activated by the hypnotist in a mechanistic manner, as implied by neo-dissociationists. Rather, it is the individuals themselves, who voluntarily relinquish a part of the ego monitoring function to the hypnotist, for the sake of having the hypnotic experience. In that

situation, subjects give free reign to those beliefs that respond to, and interact with all the contextual variables to produce the hypnotic behavior.

The schema-model is in agreement with the sociocognitive model. That is, subjects are seen as active producers of their own behaviors; They are not like passive instruments which the hypnotist act upon. Furthermore, the social influences on subjects' behaviors operate through the individuals' belief systems. In general, the social knowledge and beliefs, of an era or a culture, are internalized within individuals in the form of schemata or belief structures. However, the sociocognitive perspective de-emphasizes the importance of individual differences. This approach assumes that if all people were taught how to use their skill and were exposed to the same social pressures, they would all be able to generate the same responses. However, peoples' beliefs vary and these early schemata or beliefs are hard to change. Kelly called them core constructs, and "robust hidden-hand editors" of the individuals' experiences. This does not mean that people cannot change some of their beliefs; Rather, the earlier the beliefs are formed, the harder to change they become. Beliefs become stronger with certain experiences that fuel, and are fueled by them. Thus, the sociocognitive theorists should give more emphasis to the early developmental influences that give rise to individual variations in beliefs, skills, and behaviors. By making such a change, they will be able to give a more comprehensive picture of hypnotic behaviors.

Moreover, the schema-model is also consistent with the synergistic model, in that it can account for individual differences, which are of great concern to synergistic theorists. Differences among individuals are anticipated by the schema-model to the degree that there is variation in the individuals' environments and up-bringing, and in their learning experiences and social development. If we take individual differences on imagery ability

as an example, subjects who have developed those skills must have gone through experiences that made them harness these faculties early in life whereas other individuals, with different experiences, may have the same faculties but in a less developed state. If we take into consideration the great plasticity of the brain in childhood, and that the brain's development and neural wiring is greatly influenced by the persons' experiences for a long time after birth, the importance of these developmental influences in shaping subjects' beliefs and skills become more salient.

All people make some assumptions about how they perceive, remember, and forget. If beliefs shape behaviors, what are the common beliefs that people have about their memory? An informal survey by Loftus and Loftus (1980) showed a widespread belief in memory permanence among both lay people and professionals; Nearly 60% of non-psychologists, and over 80% of psychologists, endorsed the permanence of memory, despite some literature to the contrary. When asked to elaborate, both groups gave examples of retrieval strategies that allegedly can recover lost information, such as hypnosis, and brain stimulation, among others. Also, Legault and Laurence (1996), found that despite familiarity with the notion of malleability of memory, this knowledge was not applied consistently to other areas. The same endorsement of beliefs was found in Yapko's survey (1994) among psychologists in the United States. A large proportion of respondents (79%) were aware of the possibility of suggesting false memories, but a large proportion also (54%) believed that hypnosis could be used to retrieve memories of actual events from as far back as birth. All these findings indicate that accurate knowledge about memory fails to be applied to situations where strong contradicting beliefs are deeply ingrained within individuals.

The ineffectiveness of the experimental instructions to influence memory creation rates also suggest that briefly presented information, or knowledge given at the surface level, cannot protect a person against creating memories if he/she has the beliefs which allow such creations. By the same token, such information also fails to increase the probability of memory creation at the absence of such beliefs. In other words, the created reality (imagined events) will become actual reality only if the creation is believed, where the blind conviction or belief is absent, their will be no effect.

The implications of these findings for therapeutic procedures with child sexual abuse (CSA) clients, who had no recollections of abuse, are informative. For example, early in therapy with CSA clients, and before recovering any memories, a lot of work is done to create a conviction that the client has been abused. Most of the early procedures target the clients' beliefs. That is, clients are told that their symptoms are indicative of a CSA history, they join therapy groups with other CSA clients, and they are given books to inform them about problems of sexually abused people. All these elements serve as the basis for creating a belief in the history of abuse. The clients become saturated with this information without being aware that they have been saturated. Furthermore, therapists' beliefs and expectations may interact with particular patient vulnerabilities and result in patients mistakenly categorizing and interpreting images as experience-based memories of abuse. In addition, these clients experience difficulties in their lives, and they are highly motivated to learn the reasons for those difficulties. Thus, they become less motivated to reject or test the information. Instead, they embrace the beliefs of the therapists, who are perceived by clients as trustworthy and professional figures. Therefore, clients may show the stereotypical characteristics of the reality of abuse that emerges as a result of the conviction that the true explanation for their

problems has been found. After a certain degree of conviction about the alleged abuse is created, together with certain beliefs about hypnosis and memory recovery, this conviction will guide the clients' construction of the alleged memories. These findings highlight the importance of beliefs as an *a priori* factor for structuring the experience of "recovered memories" of abuse. Therefore, therapeutic persuasion procedures should not be pursued at all.

#### Prediction of memory creation

The analyses showed that hypnotizability, duality, and cognitive effort were the best predictors of pseudomemory reports. All theories of hypnosis mentioned earlier agree that hypnotizability is associated with memory creation. The sample of subjects in this study did not have any high hypnotizables (scores of 9 - 11 on HGSHS:A). Nevertheless, we obtained reports of memories from both low and medium hypnotizable subjects. These findings replicate the findings by Labelle et al (1990), and suggest that, despite increasing the risk of memory creation, high hypnotizability is not necessary to create memories. Eleven subjects out of the 22 mediums, 50% (scored 5 - 9 on the HGSHS:A), and 8 subjects out of the 23 low hypnotizables, 35% (0 - 4 on the HGSHS:A) reported the memory.

The second predictor of memory creation was duality. Out of the 11 subjects who passed the duality criterion, eight subjects created the memory (73%). Subjects who showed this cognitive style, were five times more prone to create the memory. However, it is not clear why subjects who show duality are more prone to create memories than subjects who don't show it? These subjects are expected to be in better contact with reality than subjects who lose their adult identity. This is a challenging question that could not be answered in the light of any of the three theories. However, I speculate that

people who show this cognitive style have a capacity for divided attention. Therefore, a part of subjects' attention is invested in constructing the memory and becoming absorbed in it, thus feeling like the child (the experiencing part); And the other part remains in the present, thus maintaining the adult identity (the observing part), simultaneously or in alternation.

It seems that it is important to retain, at least partially, the observing part in order to create memories. Subjects who lost their adult identity were found less prone to memory creation than the ones who showed duality. Also, memories have been created with un hypnotized subjects using leading questions and suggestions; These subjects are fully in possession of their adult identities. Therefore, it seems that this adult part is the one that creates memories. That is, the adult part makes the effort to remember and guess about the past, filling in the gaps when failing to recall some piece of information. However, the ability for divided attention in these individuals is only a hypothesis that should be tested in future studies to lend it some support.

The third predictor of memory creation was cognitive effort. People can choose to engage in a relatively effortless, belief-guided recall, or a more effortful and extensive memory search. Conceivably, several factors influence people's selection of a recall strategy. However, these factors go beyond, and are of little relevance, to the topics of this study, and will not be discussed here. Nevertheless, our results showed that subjects who made efforts to remember were more than 6 times more likely to create memories. Again, these results highlight the dangers involved in using therapeutic procedures such as imagery and hypnosis and encouraging clients to make efforts to recover the alleged memories. Those techniques should not be used because they may increase the risk of creating expected, rather than factual, memories.

The findings of this study emphasized the role of cognitive effort as the most reliable predictor of memory creation. Cognitive efforts are the product of the adult conscious mind, thus, only a non-hypnotized adult, or the adult part in hypnotized subjects who experience duality, can make this effort. In our sample, out of the 19 subjects who created memories, only seven subjects met the HOS criteria (passed both the age regression and duality). All the subjects, who passed HOS criteria and created memories had partially kept their adult identity (duality). The other 12 subjects did not pass this criterion, which means that they retained their adult identity. As mentioned before, if a subject did not pass the age regression item, this means that he/she had mainly kept the adult identity. If the adult identity is responsible for memory creation, the range of memory creation could be very wide. All the low (13% of the population) and medium hypnotizables (74% of the population) retain, to varying degrees, their adult identity, and half of the high hypnotizables still retain their adult identity under hypnosis. Of course, there are many factors that can moderate peoples' behaviors, or protect them against memory creation. Skepticism about memory, strong beliefs or convictions that contradict the suggestions, and lack of motivation, among others, may impede the acceptance of memory creation.

#### Memory creation before and after the HO suggestion.

Out of the 19 subjects who created a memory, seven subjects reported the memory before, and 12 after the HO suggestion was administered. These two groups differed significantly on their imagery and absorption abilities. Subjects who reported the memory after the HO suggestion scored higher on both skills. Why this difference on these two dimensions? And why did the subjects in the After-HO group ( who have these abilities) not use them to

construct the memory before the HO suggestion was given? The answers to these questions are not easy. However, it is possible that some people respond quickly and effortlessly to social demands, while others may respond with repeated pressures. Memory creation as a result of repeated questioning has been demonstrated in many studies. With the repeated demand for reporting these subjects made efforts and used their imagery and absorption skills to help construct their responses. These findings are similar to those found in Labelle et al.'s study (1990), which demonstrated the association between imagery ability and memory creation.

More subjects created memories after (12), than before (7) the HO suggestion was administered. Therefore, the HO suggestion is better interpreted as a demand to report more information than as an access to a memory structure, as implied by neodissociationists. The HO suggestion is a strong demand that gives subjects a license to use their imagination and absorption skills to construct what they were asked about. Therefore, HO suggestion is a dangerous and powerful technique which may double the rates of memory creation. Therefore, this suggestion should be used, as proposed by Lynn et al. (1994), neither in a clinical nor in a forensic setting.

#### The relationship between memory strength and memory creation

The second hypothesis predicted that subjects who perceived themselves as having good memories would be more resistant to memory creation in hypnosis. This hypothesis was not supported; Memory strength was found unrelated to memory creation. Memory strength may allow subjects to have better recall of events in their everyday lives; Nevertheless, it does not seem to protect them from creating memories (at least in a hypnotic context), nor does it seem to make them create more than others.



### Confidence in memories after hypnosis.

Before discussing our third hypothesis, it is worth mentioning that it is not only that beliefs bias subject's experiences, beliefs are also reinforced by those biases. For example, when a goodness-of fit happens between the subject's constructions and his/her anticipations (derived from beliefs), the constructions are interpreted as evidence for the beliefs, thus, supporting and maintaining them. People will have more confidence in the created memories, and they will defend them when they are confronted with evidence against their claims, in order to avoid anxieties produced by the challenge to their established beliefs. This may help explain why most of the subjects became sure and insisted that the invented events had happened to them, even when confronted with their own low confidence ratings of the memory before hypnosis.

The third hypothesis predicted an overall increase of confidence in the created memories after hypnosis. This hypothesis was supported. Subjects who created memories increased their confidence in them after hypnosis. The increase was similar across the three instruction groups. Moreover, there were some other interesting findings that were not anticipated at the beginning of this study; Subjects in the no-creation group also increased their confidence, but in the opposite direction. That is, they increased their confidence that the memory did not happen to them, a trend that was more pronounced for the two groups that received instructions about memories. A sociocognitive explanation for subjects' increased confidence in created memories would be that subjects use self-deception as an adaptive strategy to maintain acceptable self-narrative and good self-presentation. However, it is not clear, from a sociocognitive perspective, why the subjects in the no-creation group also increase their confidence that the memory did not happen to them.

Maintaining a positive self-narrative and self-presentation is better attained if the confidence ratings remain the same.

The schema-model suggests the possibility that the subjects' beliefs have biased their judgments about the truth of memories. That is, subjects who created memories would be biased to judge the memory as accurate ("sure happened"), and the subjects who did not create the memory would also be biased to judge the memory as "sure did not happen". For example, the subject who did not create the memory would think to him/herself, I could not remember, therefore, it is sure that the memory did not happen.

Nevertheless, the three-way interaction was almost significant, suggesting that memory instructions may have implicitly prompted subjects who did not create memories to make a judgment (decision) about the truth of memory. Their judgments were biased, as mentioned before, in line with their beliefs. The increase of confidence that the memory "did not happen to them" was more pronounced for the two no-creation groups who received instructions, whereas subjects' confidence remained stable for the control group who did not have any instructions. The first group's instructions were that memory is stored faithfully in the brain, and sometimes, especially under hypnosis, people can remember more. Consequently, subjects who were not able to remember would be prompted to make a judgment that the memory did not happen, and their confidence would increase in that direction. Similarly, the second group's instructions were that memory is a reconstructive process, and sometimes, especially under hypnosis, people mix suggestions with their actual memories. Subjects who did not construct the memory would also be prompted to make a judgment that the memory surely did not happen. Subjects in the no-instruction group, who did not create memories, were not under any challenge to make any decisions, therefore,

their confidence in memory was less biased. Nevertheless, these results should be interpreted with caution because of the small sample used in this study. It would be interesting to test this hypothesis in future studies using larger sample of subjects, where the focus of the study would be on the influence of instructions on judging the truth of memories in both hypnotic and non hypnotic contexts.

Conceivably, in all the instruction groups, subjects who created memories were also making decisions, and their decisions were biased by their beliefs towards increasing their confidence ratings. As in all cases of created memories, subjects usually defend their creation to avoid threats to their established beliefs. Furthermore, to judge their experiences successfully and to reduce uncertainty to the minimum, most subjects keep a high trust/doubt ratio in favor of their beliefs. Only 3 out of 19 subjects in the creation group did not increase their confidence in memory after reporting it. These subjects could be skeptical about memory and hypnosis, or maybe they were aware of their use of imagination. When asked if he remembered the event, one of the subjects said "no I don't remember, but I can imagine it". Also, some subjects from the no-creation group reported that when they were asked about the memories, they were able to visualize them, but their doubts in them were high, so they did not report them.

#### Frequency of the hidden-observer

Unfortunately, our sample did not have any high hypnotizable subjects, therefore, we couldn't draw conclusions about the rates of HO responding across the whole range of hypnotizability. Nevertheless, we can draw some conclusions from the frequencies of the HO responses reported in this study:

First: Hypnotizability did not predict the HO responses. Therefore, HO responding in age regression is not limited to high hypnotizables, as is the case in hypnotic analgesia experiments (Laurence et al., 1983). HO reports were obtained from the sample of subjects in this study, which had medium and low hypnotizable subjects only. For example, six out of the nine subjects (66.7%), who met the strict criterion for the HO suggestion scored in the medium range of hypnotizability on the HGSHS (5 - 8), and three subjects (33.3%) scored in the low range (0 - 4). Also, from the 29 subjects who met the loose criterion, 14 subjects (48.3%) scored in the medium range, and 15 subjects (57.7%) scored in the low range. Nevertheless, in this sample, not all subjects responded to this suggestion. The rates of HO reports for the first memory were: 17.8% (strict criterion) and 46.7% (loose criterion). And the rates for the second memory were: 17.8% (strict) and 51.1% (loose). These rates were much lower than the ones reported by Lynn et al (1994). The lower rates of HO responding suggest that both individual and contextual variables are important in producing a HO response. These findings support the synergistic model of hypnosis.

Second: 42.2% of subjects reported an event, during hypnosis, in which they previously had no confidence, or which they were sure "did not happen" (before hypnosis). Therefore, the HO responses do not reflect access to a memory store. Rather, they are better conceptualized responses to demands to report more information, demands which the subject can accept or reject. Subjects' reasons for accepting or rejecting the demand may depend on many factors, such as their interpretations of this suggestion, among others. However, in the post hypnotic interview most of our subjects reported that they felt compelled to answer when they were given the HO suggestion. Indeed, some subjects who said that they were not compelled still explained

their response as a moral obligation. For example, one of the subjects reported:

"I did not feel compelled or forced, but it is like when someone asks you something, or gives you something you feel like you have to answer or you have to respond, it doesn't mean that I am forced".

Furthermore, the subjects interpretations of the HO suggestion varied, and their experiences varied in line with their interpretations. These are some of the HO responders reports to the question about what they felt when the HO suggestion was given:

- " I felt I am more in tune with what was happening. It's like fine tuning, I felt more there, things become more vivid, like seeing more details".

- "I shifted focus. Before, it was like I was concentrating and looking at the chameleon changing colors in the zoo, and I felt so happy to see it changing colors, it was amazing. When you asked for the hidden part, it's like I shifted focus and I started seeing a global picture, something like a global view. I started seeing other animals, a family of elephants and others all over the place, sure they were there, but I wasn't seeing them before because I was focusing on the chameleon".

- "I shifted focus, it is like a camera, one time you see things from this angle, then you see it from a different angle".

- "I became more as the child, before I felt like I am in my adult body. I was mentally like the child but in my adult body, I felt higher than the other students, I was at the level of the principle. I did not feel comfortable, because I looked different than other students, I was big and they were small. When you asked me about the hidden part, I started shrinking and became like the child, both mentally and physically, only then I felt comfortable.

Two major themes were noticed in the interpretation of this suggestion. The first theme was the "shifting of focus", suggesting that in order to report more information, subjects shifted their attention to other details, either local or global. Thus, additional demands were made on the subjects' attention. The second theme is fine tuning or becoming more involved in the memory. These subjects may have interpreted the HO suggestion as deepening of hypnosis; Thus they invested more in the experiencing part and felt more in tune with the event.

A word of caution is appropriate here. My interpretations are based on this sample of subjects which had low and medium hypnotizable subjects only. Therefore, one cannot generalize to the high hypnotizable population. It was noticed, for example, that the high hypnotizable subjects' reports of the duality experience, in the study by Laurence (1980, 1983), were more dramatic. Therefore, high hypnotizable subjects' experiences and interpretations could be different than low and medium hypnotizables.

In this sample, the subjects reports could be contrasted with my hypothesis that the duality experience is a capacity for divided attention. After the HO suggestion was administered, and in order to report more information, some subjects shifted more attention towards the experiencing part; Therefore, they had the feeling of being more in tune with the event, or becoming more like the child. Others have kept both parts (experiencing and observing), and responded to the demand by shifting or changing the focus of the experiencing part only.

Another possible hypothesis is that the duality experience may reflect less involvement or absorption in the hypnosis. That is, these subjects do not fully let go of their adult egos, as do subjects who loose the adult identity in favor of the experience; Thus, subjects who don't experience duality become

fully absorbed in the experiencing part and are only aware of their child identity. One can speculate that the duality experience is not an all-or-none phenomenon. Rather, it is experienced on a continuum where very low hypnotizables are at one end of the absorption scale, where they can imagine the events but do not get absorbed in their imagery keeping the adult identity completely. Their experience is like an observer of events on a screen. On the other end of the continuum are the high hypnotizables who lose their adult identity and become absorbed in the experience; They may speak and act in a child-like manner. The medium hypnotizables would fall somewhere between the two poles, and the high hypnotizables who experience duality would fall somewhere on the borderline between medium-high and high' Thus retaining a part of their adult identity and at the same time becoming absorbed in the experience (or shifting between them). This is a speculation that would be interesting to test in future research, if the absorption scales are sensitive enough to detect these differences, especially between the two groups of high hypnotizables (with and without duality).

Some subjects reported that their experiences were different for the two memories. For example, some subjects reported that they felt more like the child in the first memory, and that they almost lost their adult identity. However, in the second memory, they kept shifting between the adult and the child identities. Therefore, it is not clear that the duality experience in age regression is a stable cognitive style for subjects who respond to a HO suggestion. It may be simply an experience that is shaped by the demands of the HO structure.

A rival hypothesis remains as a possible explanation for the duality experience; That is, these responses are the consequences of demands implied in the HO structure. The HO suggestion instructs subjects that there is a part

other than their hypnotized part; and subjects may interpret and shape their experience in line with these instructions.

The rates of the HO responses could be influenced by individual variables as well as by situational variables. In other words, the HO responses would be seen as the match between the demands implied in the HO structure, and the subjects' attributes or skills available to execute a response. For example, more subjects would be expected to respond to a HO suggestion which has a simple demand to report more information in an age regression context, than would be expected in a hypnotic analgesia context (as the rates reported by Laurence et al, 1980, 1983). The latter context may require more cognitive efforts and concentration to achieve the analgesia condition, which may drain the attentional resources of medium hypnotizable subjects. Only high hypnotizable subjects with high divided attention abilities can achieve the analgesia condition with little efforts, or effortlessly, and still have the ability to focus and invest some of their resources to produce the required ratings of pain that are implied in the HO structure. Thus, the HO rates could be influenced by individual variables (skills) as well as by situational variables (quality of the demands).

At this point, we cannot draw clear cut conclusions about the HO responses from this study, because the subjective experience of duality was assessed globally. That is, it was not possible to obtain an assessment of duality experience before the HO suggestion was administered because it would be hard for subjects to remember how they felt in each segment of the hypnotic experience. Because the HO responding could be shaped by demand characteristics, subjects' responses to the HO are confounded with the demands implied in the HO structure. That is, it is hard to identify whether the subject is complying to the demands implied in the HO suggestion (that



there is another part), or if the subject experiences duality, and therefore, responds to the HO suggestion.

However, it seems that adopting the strict criteria, used in this study, can distinguish between subjects who have certain cognitive skills that allow them to respond to this suggestion. Subjects who met the strict criterion were more consistent in their responses, than the ones who met the loose criterion. The demands for the two HO suggestions were different, for example, the demand implied in the first HO suggestion was to report more information only, but the demands of the second suggestion were both to construct the memory and to report it. Therefore, the inconsistency in responses to the two HO suggestions may indicate that subjects were responding to the different demands differently. In contrast, the consistency of responses across both situations may reflect a certain cognitive style, or certain capabilities that allows a HO response.

#### Prediction of hidden-observer

The puzzling finding in this study was that the IDQ was the only variable that can reliably predict HOS responses. The IDQ correlated negatively with HOS reports, suggesting that the HO responses are not related to imagery. However, subjects who reported the memory after the HO suggestion scored higher on imagery and absorption abilities than subjects who reported the memory before, suggesting that HO responses are related to high imagery and absorption. This paradox, however, can be clarified if we consider that the HO responses were confounded with demand characteristics of the two HO suggestions: For example, 11 subjects, out of the 19 who reported the memory, did not pass the HOS criteria, suggesting that these subjects were only complying to the demands implied by the HO suggestion,

and their reports could not be considered as HO responses. Therefore, it could be concluded that, while high imagery is not necessary to obtain a HO response, high imagery and absorption skills are important when stronger demands, such as memory creation, are involved in the HO suggestion. In order to be able to comply to the demands, subjects will make efforts to remember, thus, they invest their imagery and absorption skills in constructing the memory.

### Conclusions

This study emphasized the major role played by belief systems in structuring and biasing subjects' experiences of memory creation. A word of caution is worth mentioning concerning memory creation. To be consistent with the conceptualization of memory as a process, literally, a memory cannot be created and permanently stored (otherwise it would be a structure); rather, subjects' beliefs guide the re-construction and the creation of memories. The persons' willingness to believe the memories creates a reality in which the assumptions actually become facts for the person. This process may have the highly desirable advantage of allowing for an effective form of therapy. But like all remedies, when used inappropriately, it can be misused. The misuse could be further enhanced by using procedures in an effort to encourage clients recover memories of abuse. The HO suggestion in therapy can be a dangerous and powerful technique that may influence some vulnerable people to use their imaginations to construct what has been suggested. The memories created in this study were of trivial or common events that have no negative consequences on subjects' lives. For example, it doesn't hurt to believe that someone fell down the stairs or made a mess with food when five years old. But when the created event is traumatic or hurtful, such as sexual abuse by a parent, a belief to be abused can color the subject's perceptions

about themselves and the people surrounding them, making them face the world as miserable victims of injurious and distrustful world. This may add to their problems and influence their interactions with others. Finally, therapists' beliefs (which become the clients' beliefs too), together with techniques encouraging clients to make efforts to remember, will shape the production of "recovered memories" of abuse.

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Appendix A  
Personal Memory Questionnaire (PMQ)



- 12) Skiing in the winter with my parents.  
(Age: ) | | | |
- 13) The family moving to another house.  
(Age: ) | | | |
- 14) Making a mess with Ketchup.  
(Age: ) | | | |
- 15) The birth of a sibling.  
(Age: ) | | | |
- 6) Peeing in my pants.  
(Age: ) | | | |
- 17) A birthday party, with pizza and a clown.  
(Age: ) | | | |
- 18) Visiting some one in the hospital.  
(Age: ) | | | |
- 19) Being locked in a closet.  
(Age: ) | | | |
- 20) Visiting the zoo and watching animals.  
(Age: ) | | | |
- 21) Getting spanked by one of your parents.  
(Age: ) | | | |
- 22) Falling down the stairs and hurting yourself.  
(Age: ) | | | |
- 23) Having nightmares frequently.  
(Age: ) | | | |
- 24) Choking with food while eating.  
(Age: ) | | | |
- 25) I was hospitalized, or going to the emergency  
(Age: ) | | | |

Appendix B  
Tellegen's Differential Personality Questionnaire  
Scale Ab (TAS)

Differential Personality Questionnaire: Scale Ab  
Auke Tellegen, Ph.D.  
University of Minnesota, 1978

In this booklet you will find a series of statements a person might use to describe his or her characteristics. Each statement is followed by two choices-- True and false. Read the statement and decide which choice better describes you. Then circle your answer beside each statement.

Please answer every statement, even if you are not completely sure of the answer. Read each statement carefully, but do not spend too much time deciding on the answer.

- |    |                                                                                                                                                                                                              |      |       |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|
| 1. | Sometimes I feel and experience things as I did when I was a child.                                                                                                                                          | True | False |
| 2. | I can be greatly moved by eloquent or poetic language.                                                                                                                                                       | True | False |
| 3. | While watching a movie, a television show or a play, I may become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I were taking part in it. | True | False |
| 4. | If I stare at a picture and then look away from it, I can sometimes "see" an image of the picture, almost as if I were still looking at it.                                                                  | True | False |
| 5. | Sometimes I feel as if my mind could envelop the whole world.                                                                                                                                                | True | False |
| 6. | I like to watch cloud shapes change in the sky.                                                                                                                                                              | True | False |
| 7. | If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.                                                                                     | True | False |
| 8. | I think I really know what some people mean when they talk about mystical experiences.                                                                                                                       | True | False |

- |     |                                                                                                                                                                                   |             |              |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|
| 9.  | I sometimes "step outside" my usual self and experience an entirely different state of being.                                                                                     | <b>True</b> | <b>False</b> |
| 10. | Textures--such as wool, sand, wood--sometimes remind me of colors or music.                                                                                                       | <b>True</b> | <b>False</b> |
| 11. | Sometimes I experience things as if they were doubly real.                                                                                                                        | <b>True</b> | <b>False</b> |
| 12. | When I listen to music, I can get so caught up in it that I don't notice anything else.                                                                                           | <b>True</b> | <b>False</b> |
| 13. | If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.                                                                                        | <b>True</b> | <b>False</b> |
| 14. | I can often somehow sense the presence of another person before I actually see or hear him or her.                                                                                | <b>True</b> | <b>False</b> |
| 15. | The crackle and flames of a wood fire stimulate my imagination.                                                                                                                   | <b>True</b> | <b>False</b> |
| 16. | It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily altered.             | <b>True</b> | <b>False</b> |
| 17. | Different colors have distinctive and special meanings for me.                                                                                                                    | <b>True</b> | <b>False</b> |
| 18. | I am able to wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it. | <b>True</b> | <b>False</b> |
| 19. | I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.                                     | <b>True</b> | <b>False</b> |
| 20. | Things that might seem meaningless to others often make sense to me.                                                                                                              | <b>True</b> | <b>False</b> |



- |     |                                                                                                                                                                        |             |              |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|
| 21. | While acting in a play, I think I could really feel the emotions of the character and "become" him or her for the time being, forgetting both myself and the audience. | <b>True</b> | <b>False</b> |
| 22. | My thoughts often don't occur as words but as visual images.                                                                                                           | <b>True</b> | <b>False</b> |
| 23. | I often take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colors in soap bubbles.               | <b>True</b> | <b>False</b> |
| 24. | When listening to organ music or other powerful music, I sometimes feel as if I'm being lifted into the air.                                                           | <b>True</b> | <b>False</b> |
| 25. | Sometimes I can change noise into music by the way I listen to it.                                                                                                     | <b>True</b> | <b>False</b> |
| 26. | Some of my most vivid memories are called up by scents and smells.                                                                                                     | <b>True</b> | <b>False</b> |
| 27. | Certain pieces of music remind me of pictures or moving patterns of colors.                                                                                            | <b>True</b> | <b>False</b> |
| 28. | I often know what someone is going to say before he or she says it.                                                                                                    | <b>True</b> | <b>False</b> |
| 29. | I often have "physical memories"; for example, after I've been swimming I may still feel as if I'm still in the water.                                                 | <b>True</b> | <b>False</b> |
| 30. | The sound of a voice can be so fascinating to me that I can just go on listening to it.                                                                                | <b>True</b> | <b>False</b> |
| 31. | At times I sometimes feel the presence of someone who is not physically there.                                                                                         | <b>True</b> | <b>False</b> |
| 32. | Sometimes thoughts and images come to me without the slightest effort on my part.                                                                                      | <b>True</b> | <b>False</b> |
| 33. | I find that different odors have different colors.                                                                                                                     | <b>True</b> | <b>False</b> |
| 34. | I can be deeply moved by a sunset.                                                                                                                                     | <b>True</b> | <b>False</b> |

**Appendix C**  
**Individual Differences Questionnaire**

Individual Differences Questionnaire  
(From Paivio, 1971)

Name: \_\_\_\_\_

Date: \_\_\_\_\_

The statements on the following pages represent ways of thinking, studying and problem solving. No two statements are exactly alike, so consider each statement carefully before answering. You are asked to rate each item on a 5-point scale which relates to how characteristic the statement is of you. Circling a rating of -2 indicates that the statement is extremely uncharacteristic of you, a rating of +2 indicates that the statement is extremely characteristic of you, a rating of 0 indicates that the statement is neither characteristic nor uncharacteristic of you.

It is important that you answer as frankly and as honestly as you can. Your answers will be kept in the strictest confidence.

+-----+-----+-----+-----+  
-2   -1   0   +1   +2

	Extremely Uncharacteristic		Extremely Characteristic
1.	Listening to someone recount their experiences does not usually arouse mental pictures of the incidents being described.	-2 -1 0 +1 +2	
2.	By using mental pictures of the elements of a problem, I am often able to arrive at a solution.	-2 -1 0 +1 +2	
3.	I enjoy visual arts, such as painting, more than reading.	-2 -1 0 +1 +2	
4.	My daydreams are so vivid I feel as though I actually experience the scene.	-2 -1 0 +1 +2	
5.	I do not have a vivid imagination.	-2 -1 0 +1 +2	
6.	I can easily picture moving objects in my mind.	-2 -1 0 +1 +2	
7.	I can form mental pictures to almost any word.	-2 -1 0 +1 +2	

8.	I have only vague impressions of scenes I have experienced.	-2	-1	0	+1	+2
9.	I think that most people think in terms of mental pictures whether they are completely aware of it or not.	-2	-1	0	+1	+2
10.	My powers of imagination are higher than average.	-2	-1	0	+1	+2
11.	I can close my eyes and easily picture a scene I have experienced.	-2	-1	0	+1	+2
12.	When someone describes something that happens to them I find myself vividly imagining the events that happened.	-2	-1	0	+1	+2
13.	I seldom dream.	-2	-1	0	+1	+2
14.	I never use mental pictures or images when trying to solve problems.	-2	-1	0	+1	+2
15.	I find it difficult to form a mental picture of anything.	-2	-1	0	+1	+2
16.	My dreams are extremely vivid.	-2	-1	0	+1	+2
17.	My thinking often consists of mental pictures or images.	-2	-1	0	+1	+2
18.	My daydreams are rather indistinct and hazy.	-2	-1	0	+1	+2
19.	I enjoy the use of mental pictures to reminisce.	-2	-1	0	+1	+2
20.	I often use mental images or pictures to help me remember things.	-2	-1	0	+1	+2
21.	I do not form a mental picture of people or places while reading of them.	-2	-1	0	+1	+2

Appendix D  
Autobiographical Memory Questionnaire

ABMQ

Please decide whether you agree or disagree with each statement below. Indicate the extent to which you agree or disagree by circling the appropriate number on the scale.

1. When I remember events from my past, it feels as though I can remember all the details of those experiences.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

2. When I reminisce with friends or family about experiences we have shared in the past, I find that I can remember the details of those events much better than they can.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

3. In general, I have difficulty remembering experiences from my past.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

4. I feel that the memories I have about my high school years are vivid and very accurate.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

5. My memory for my first days of elementary school are clear and I can remember many of the thoughts and feelings that I had.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

6. When I look at photographs taken of myself in childhood, I have difficulty remembering when and where a particular photograph was taken and the events that were happening at the time.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

7. I have a clear memory for some of my birthdays in my childhood.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

8. I can call to mind experiences from my past very easily when ever I want.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

9. When people tell me about something that I said or did in the past, I usually remember it well.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

10. I tend to only remember very significant, important or meaningful events from my past (e. g., tragic events, great accomplishments, or surprises etc.).

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

11. I am sometimes quite amazed by the accuracy and clarity of my memory for experiences in my life.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

12. If I were to try, I could probably remember some of the things that happened to me before I was three years old.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

13. My memory for my past is almost like a book that I can open and look through whenever I wish.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agr

14. I find it easy to remember the things I thought about and believed when I was an adolescent.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

15. I find it quite difficult to remember how I felt or the emotions I had when I was a child.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

16. If I were to try, I could probably remember almost everything I have done in the past three years.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

17. Memories from my past often enter my mind "out of the blue" without me even having to try.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

18. I have a very good memory for most of the things I did when I was sixteen years old.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

19. My Memory for the feelings or emotions I have had during different experiences in my life are particularly vivid and clear.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

20. I find it very easy to remember most of the things I did in my childhood.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree

21. I usually remember even the most "everyday" or neutral experiences in my life.

1	2	3	4	5
strongly Disagree	disagree	Neither agree Nor Disagree	Agree	Strongly Agree



**Appendix E**  
**Informed Consent Form**

## Informed Consent Form

### Background Information for Participation in Research Study in the Hypnosis Laboratory, Department of Psychology

Name: \_\_\_\_\_

Telephone: \_\_\_\_\_

The research carried out with volunteer subjects in the Hypnosis Laboratory of the Department of Psychology includes a number of continuing research projects. Our studies are concerned with understanding more about the nature of hypnosis and various hypnotic phenomena. The success of our research depends upon the assistance of volunteers like yourself and we are very grateful for your participation.

Please sign this form after reading the following section:

Today I am volunteering to participate in a research study which will involve completing two separate sessions. During the first session, I will be asked to fill out some questionnaires, and to pass through a series of hypnotic suggestions aiming at evaluating my hypnotic abilities. This session will last approximately 75 minutes. The second session will involve the individual administration of a combination of hypnotic test items (e. g., arm levitation which will be tested by holding your arm out and seeing if it moves upwards; hypnotic age regression where you will be asked to go back to a certain event in your childhood, etc.). This session will last approximately 75 minutes. My participation will also involve discussing my experience of hypnosis after the second session. I understand that I am free to discontinue my participation in this experiment at any time.

Signature: \_\_\_\_\_

Investigator: \_\_\_\_\_

Date: \_\_\_\_\_

Appendix F  
Transcript of the Hypnosis session

## RELAXATION

First of all, just get yourself comfortable in the chair... just move around until you find a comfortable position... notice that the back of the chair is adjustable... just get comfortable and relaxed...

OPTIONAL: Unclasp your hands and let them just rest loosely on your lap, or the arm of the chair.

OPTIONAL: And uncross your legs and let them find a comfortable position on the footrest of the chair.

... and if at any time during the session you find that this position is uncomfortable, you can simply adjust it to a more comfortable one without in any way disturbing the hypnosis.

I would like you to look at the dot on the door... and focus your vision on it. I will refer to the dot as the target. In the meantime, I'm going to give you some simple instructions that will help you to experience hypnosis. You will find the instructions easy to follow and that you will be able to experience the things I describe to you.

Indeed you will probably find that you will be able to experience these things with greater vividness... and with greater intensity than the earlier session. As you stare at the target, you may find that occasionally, your gaze may wander or that your vision may even blur... If this happens, simply refocus your vision and continue starring evenly at the target...

Now take in a deep breath and hold it... hold it until it starts to feel a little uncomfortable... and then... when it starts to feel uncomfortable... just let it out very slowly... You find that you start to experience a comfortable feeling... a feeling of well being begins to develop as you continue to rest in the chair... looking at the target... listening to my voice. Now take another deep breath

and hold it... notice the feeling of tightness and tension in your abdomen... and then... as it starts to feel uncomfortable... just as you did before... let it out very slowly... notice that breathing out... with letting the tension out of your lungs... makes you become even more aware of a feeling of comfort and well being settling over you... Just sink deeper into the chair... and focus your attention closely on feelings of warmth and relaxation in various parts of your body... in your head and in your neck... in your arms and in your legs... in your chest and in your back... and just breath freely and evenly and deeply... freely... evenly... and deeply... not too quickly... not too slowly... just at a comfortable rate for you to notice that the relaxation increases gradually as you breath out...

You may even be aware of the walls of your chest growing looser... let any tension leave as you breath out... and just rest there for a moment experiencing the sensations...

Continue relaxing your chest so that feelings of warmth and comfort spread to your back... your shoulders... and your neck... and your arms... and your legs...

You're probably starting to notice some changes in the target... changes that occur from staring at it for so long... sometimes the target may look as though it's moving up and down, or from left to right... at times it may appear very distinct and clear... at other times, it may appear fuzzy and blurred... and it may change color... you may see one of these things or even all of these things... whatever you see just continue staring at the target... continue listening to my voice... continue to become more deeply relaxed... more deeply relaxed...

And as you watch the target, your eyelids become heavier... your eyes become tired from staring... your eyelids start to feel very tired and heavy...

as you sit there breathing freely and evenly... and deeply... breathing in ... breathing out... freely, and evenly and deeply... your eyelids are becoming so heavy... so tired... that soon they will close of their own accord... as if they were coated with lead paste... as if there were magnetic fields in the eyelashes... drawing your eyelashes together...

Concentrate now... even more carefully... on feelings of relaxation and comfort in various parts of your body...

First of all think of relaxation in the muscles of your left arm... the left hand... the fingers of the left hand... the left forearm... the left upper arm... the left shoulder...

And then relax the muscles of the right arm... the right hand... the fingers of the right hand.. the right forearm... the right upper arm... the right shoulder.

Think of relaxation in each of these areas... and as you think of relaxation, the muscles become progressively more relaxed...

Then relax the muscles of your neck... your chest... your back... relax each of these muscles groups... the neck... the chest... and the back...

And as you relax these muscles... your facial muscles will also relax and loosen of their own accord...

Then relax the stomach muscles by doing this... Tighten your stomach muscles... make your abdomen hard... and then when you are ready... let the tension out... Notice the feeling of well being that comes with relaxing your stomach muscles... like a gentle massaging action all over your stomach and even perhaps... up to your chest...

And then relax the muscles of your legs... the right leg... the right foot... try to feel it in the toes of the right foot... and then in the right calf... and then in the right thigh... then the left leg... the left foot... the toes of your left foot...

the left calf... and the left thigh... Then relax the muscles of the right leg... the right foot... the toes of your right foot... the right calf...

Just thinking about relaxation in each of these areas causes the muscles to become more relaxed... and you may even find an interesting thing happens... that the feelings of relaxation you feel in each of these areas of the body start to spread and irradiate... so that they may seem to join up... like the parts of a jigsaw puzzle... and you feel a deep feeling of overall relaxation... of contentment... and of well being... permeating the whole of your body...

---

(IF THE EYES ARE NOT CLOSED)

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And you have concentrated well on the target and your eyes have become tired and strained from staring... There is no longer any need to strain them anymore... they would soon close of their own accord... but you can just close your eyes now... just close your eyes... that's it...

---

IF THE EYES ARE CLOSED

---

With your eyes closed... you're ready to experience hypnosis... to experience it more profoundly... but you'll find that no matter how deeply relaxed you ever feel... no matter how deeply in hypnosis you ever feel... your mind is always clear... you're always aware of my voice and what I'm saying to you... you're always aware of what is happening to you... even though you are deeply relaxed... deeply in hypnosis...

You will remain deeply in hypnosis until I ask you if you would like to come out of hypnosis... You will experience many things... You will experience many things just for as long as I ask you to experience them...

And you will be able to speak to me when I speak to you... to open your eyes... and to move around while remaining deeply hypnotized... whatever you experience or do... you will remain deeply hypnotized... deeply in hypnosis...

IF NECESSARY:

You can now go even deeper in hypnosis... Say to yourself, just by thinking it, "Now I'm going deeper and deeper". Think it to yourself now... (PAUSE)... and imagine yourself standing at the top of an escalator... of the steps moving down... and picture the moving hand rail...

In a moment I'm going to ask you to count backwards to yourself, slowly from ten to one, imagining as you count, that you are stepping onto the first step of the escalator and standing with your hand on the railing, while the steps move down... carrying you deeper and deeper... into hypnosis. You can plan it so that you reach 1 just as you reach the bottom and step off the escalator; and to indicate for me that you have reached 1, the index finger of your right hand will lift up slowly... and I'll know that you have reached 1... More and more deeply relaxed as you start counting backwards to yourself... from 10 to 1... (Wait for finger to lift)

You can just relax your finger now... deeply relaxed... deeply hypnotized...

START SUGGESTIONS

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## 1. HAND LOWERING

Now hold your right arm out at shoulder height, with the palm of your hand up. There, that's right... Attend carefully to this hand, how it feels, what is going on in it. Notice whether or not it is a little numb, or tingling; the slight effort it takes to keep from bending your wrist. Pay close attention to your hand now... Imagine that you are holding something heavy in your hand... may be a heavy baseball or a billiard ball... something heavy... shape your fingers around as though you were holding this heavy object that you imagine is in your hand. That's it... now the hand and the arm feel heavy, as if the weight was pressing down... and as it feels heavier and heavier, the hand and the arm begin to move down... as if forced down... moving... moving... down... down... more and more down... heavier... heavier... the arm is more and more tired and strained... down... slowly but surely... down, down... more and more down... the weight is so great, the hand is so heavy... You feel the weight more and more... the arm is too heavy to hold back... it goes down, down, down... more and more down...

WAIT AT MOST 10 SECONDS.

(IF NOT ALL THE WAY DOWN).

That's good... now let your hand go back to it's original position, and relax. You probably experienced much more heaviness and tiredness in your arm than you would have if you had not concentrated on it and had not imagined something trying to force it down. Now just relax... Your hand and arm are now as they were, not feeling tired or strained... All right, just relax.

(IF ALL THE WAY DOWN)

That's good... now let your hand return to it's original position. Just let it rest there, and relax. Your hand and arm are now as they were, not feeling tired or strained. All right... relax.

## 2. MOVING HANDS APART

Now extend your arms ahead of you, with the palms facing each other, both hands close together but not touching... Both arms, straight out in front of you with palms facing each other, (If subject does not understand = let me show you...take subjects hands and place them into position). That's right, hands close together but not touching...

I would like you to imagine a force acting on your hands to push them apart, as though one hand was repelling the other... You are thinking of your hands being forced apart and they begin to move apart... separating... separating... moving apart... wider apart... more and more away from each other... more and more...

WAIT AT MOST 10 SECONDS.

That's fine. You notice how closely thought and movement are related. Just put your hands back on the arms of the chair and relax.

### 3: AGE REGRESSION

Now you are starting to drift away from the present... drifting back through time... as if you were on a magic carpet that is taking you through the past... going back now to your first day in the university... and it all seem very vivid and real to you... your first impressions of the university start to become so vivid and so real. Its all very vivid.. very real to you... and to indicate to me that it's becoming very vivid and real to you, just let the index finger of your right hand lift up... so that I will know that it's become very vivid and real to you. (PAUSE)...

OK., you will be going back even further now... further and further back... into the past... you are getting younger... younger and smaller... going right back now... right back through high school... right back to the beginning of high school... closer and closer as it becomes very vivid and real to you... right back to your very first day at high school... your very first day at high school... and just as you did before... to indicate its becoming vivid and real to you... just let the index finger rise once more....

(PAUSE)..

That's fine... back further now... further and further into the past... younger and younger... smaller and smaller... right back in time, smaller and smaller... You will find yourself going back when you were (age of first memory)... going back to the time when... (first memory). In few moments you will be there again re-experiencing this events. I will count slowly from three to one, and as I do, you will find yourself going back to that time. 3... 2..., back on, very close, 1... back there now... to indicate for me that you are back there lift your right index finger... (PAUSE)..

When subject lifts the index finger:

OK. Tell me what is happening now..

- How old are you?
- Where are you?
- What are you doing?.
- Who is with you?

That's fine...

The Hidden-observer suggestion.

(You might not have known this before, but there is a hidden part of yourself that is always present and that is present and always aware of certain things you otherwise might not notice, or things that you might tend to forget or ignore. When in a little while... I place my hand on your shoulder... like this (demonstration), I will get in touch with this part of yourself, with your unconscious mind, and you may remember new details about this event that you did not remember before or you do not remember now. And when I'll place my hand on your shoulder for the second time, you will be right back where you are now... deeply hypnotized...Now take few moments to go deeper... (pause). I'm placing my hand on your shoulder now, and may be that other part of you will be able to comment on this event.... (pause)

WAIT 20 SECONDS:

- What is happening now?
- How old are you?
- What are you doing?
- Who is with you?
- Where are you?

Canceling the hidden-observer.

(All right, now as I told you before, I am placing my hand on your shoulder a second time... and things are as they were before... right back where they were before I touched your shoulder the first time... you are deeply relaxed... deeply hypnotized.

Now I would like to ask you about another event, an event that may or may not have happened to you when you were (suggested age or grade)... Do you remember when (second memory)... (pause)

If the subject answers "YES":

Ok. Let's go back to the time of this event, I'm going to count from 3 to one, and as I do, you will find yourself going back to that time (age). 3... 2... back

on, 1... back there now, once you are there, lift your index finger so I know that you are there..... (PAUSE)

If the subject answers "NO" I don't remember:

That's fine. Sometimes it takes sometime to remember, let's go back to age (...). I'm going to count from 3 to one, and as I do, you will find yourself going back to that time (age). 3... 2... back on, 1... back there now, once you are there, lift your index finger so I know that you are there..... (PAUSE)..

(Now as we did before, I will get in touch with the hidden part of your self, with your unconscious mind, that part that knows every thing about you, and about all your memories, and you may be able to remember details that you do not remember right now. This other part of you may be able to tell me about (this event)... Now take few moments to go deeper... (pause). I'm placing my hand on your shoulder now... and may be that other part would be able to comment on this event. .. (PAUSE)...

- (SUBJECT'S RESPONSE),

- WAIT MAXIMUM 20 SECONDS

The hidden-observer suggestion cancellation:

(All right, now as I did before, I am placing my hand on your shoulder a second time... and things are as they were before... right back where they were before I touched your shoulder the first time... you are deeply relaxed... deeply hypnotized.

That's fine, now you will get on your magic carpet again, and it will take you back to the present... I will count slowly from three to one. And as I do, you will find yourself coming back to the present... deeply relaxed.. deeply in hypnosis. 3... 2..., back here, very close, 1... back in the lab now... to indicate for me that you are back here, lift your right index finger.

#### 4: ARM RIGIDITY

Now, please hold your right arm straight out, and fingers straight out too.

That's it, the right arm straight out. Now, think of your arm becoming stiffer and stiffer... stiff... very stiff... it is becoming more and more stiff and rigid as though your arm is made of steel or iron and cannot bend... (PAUSE). Stiff...

held stiff..., so it cannot bend. An arm of steel cannot bend... your arm feels as if made of steel... test how stiff and rigid it is... try to bend it... try...

WAIT AT MOST 10 SECONDS

(IF ARM BENDS)

That's fine. You probably noticed how your arm became stiffer as you thought of it as stiff, and how much effort it took to bend it. Your arm is no longer at all stiff. Place it back into position and relax.

(IF ARM DOES NOT BEND)

That's fine... don't try any more to bend it... just relax that arm and return it to it's original position... the arm is no longer stiff and rigid... all the normal sensations have returned to it... and there is no feelings of tiredness or fatigue from trying to bend it when it was stiff and rigid... Continue to relax... and to enjoy the pleasant feelings of being deeply hypnotized... Just relax.

TERMINATION OF HYPNOSIS

Now, in few moments, I will ask you if you want to get out of hypnosis... And if you would, I will count slowly from 1 to 10... and as I do... you will come out of the state you are in slowly and gradually. Are you ready to come out of hypnosis now?

OK. I'm going to count from 1 to 10. 1... 2... 3... waking up slowly.. 4... 5... 6... waking gently... 7... 8... 9... waking up gradually... 10... wide awake now... wide awake. How you feel.

## Appendix G

Descriptive Statistics for the 45 Subjects on all Variables.

---

<u>Variable</u>	<u>M</u>	<u>S.E.M.</u>	<u>SD</u>	<u>Min.</u>	<u>Max.</u>
Create1	00.00	00.00	00.00	00.00	00.00
Create2	00.42	00.07	00.50	00.00	01.00
Amnesia	00.13	00.05	00.34	00.00	01.00
HO1/S	00.20	00.06	00.40	00.00	01.00
HO2/S	00.22	00.06	00.42	00.00	01.00
HO1/L	00.47	00.08	00.50	00.00	01.00
HO2/L	00.51	00.08	00.51	00.00	01.00
Duality	00.27	00.07	00.45	00.00	01.00
AR	00.45	00.08	00.50	00.00	01.00
Effort1	00.38	00.07	00.49	00.00	01.00
Effort2	00.71	00.07	00.46	00.00	01.00
HGSHS	04.49	00.38	02.55	00.00	08.00
IDQ	21.29	01.53	10.29	- 05.00	41.00
DPQ	21.51	00.80	05.39	10.00	34.00
ABMQ	76.53	02.21	14.80	37.00	98.00

---

Note.

HO, hidden-observer; S = strict criterion; L = loose criterion;

1, 2 = first, and second memories; AR = Age regression,

IDQ = Individual Differences Questionnaire,

DPQ = Differential Personality Questionnaire

ABMQ = Autobiographical Memory Questionnaire

HGSHS = Harvard scale



## Appendix H

### Intercorrelations between Scores on ABMQ, Amnesia, Age regression, DPQ, HGSHS:A, and IDQ.

---

<u>Variable</u>	<u>ABMQ</u>	<u>Amnesia</u>	<u>AR</u>	<u>DPQ</u>	<u>HGSHS</u>	<u>IDQ</u>
ABMQ	1.000					
Amnesia	0.137	1.000				
AR	0.407	0.026	1.000			
DPQ	0.255	0.134	0.328	1.000		
HGSHS	0.339	0.339	0.349	0.367	1.000	
IDQ	0.297	- 0.017	- 0.123	0.424	0.197	1.000

---

#### Note.

ABMQ = Autobiographical Memory Questionnaire

AR = Age regression

DPQ = Differential Personality Questionnaire

IDQ = Individual Differences Questionnaire

HGSHS = Harvard scale

## Appendix I

### ANOVA Source Tables for the (ABMQ), (DPQ), (IDQ), and HGSHS:A

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F-value</u>
ABMQ (error)	2 (42)	49.40 (227.2)	0.217
DPQ (error)	2 (42)	08.95 (30.0)	0.298
IDQ (error)	2 (42)	107.02 (105.8)	1.011
HGSHS (error)	2 (42)	00.95 (6.7)	0.145

\* $p \leq .05$ .

#### Note.

ABMQ = Autobiographical Memory Questionnaire

DPQ = Differential Personality Questionnaire

IDQ = Individual Differences Questionnaire

HGSHS = Harvard scale

Appendix J  
Logistic Regression Analysis for Memory Creation as a  
Function of Predictor Variables

Logistic Regression Analysis of Memory Creation as a Function of Hypnotizability.

---

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
HGSHS	0.222	.129	2.97	1	.1259	1.25
Constant	-1.34	.68	3.81	1		

---

\* $p \leq .05$ .

Note.

HGSHS = Harvard scale for hypnotic ability

Logistic Regression Analysis of Memory Creation as a Function of IDQ, DPQ, ABMQ, and HGSHS:A.

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
IDQ	-0.017	0.034	0.239	1	.0000	0.983
HGSHS	0.227	0.143	2.531	1	.0931	1.255
DPQ	- 0.011	0.068	0.027	1	.0000	0.988
ABMQ	0.009	0.023	0.167	1	.0000	1.009
Constant						

\* $p \leq .05$ .

Note.

ABMQ = Autobiographical Memory Questionnaire

DPQ = Differential Personality Questionnaire

IDQ = Individual Differences Questionnaire

HGSHS = Harvard scale for hypnotic ability

Logistic Regression Analysis of Memory Creation as a Function of IDQ, DPQ, ABMQ, with HGSHS Omitted.

---

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
IDQ	-0.017	0.034	0.247	1	.0000	0.983
DPQ	- 0.021	0.064	0.112	1	.0000	1.022
ABMQ	0.0189	0.022	0.712	1	.0000	1.019
Constant						

---

\*p ≤ .05.

Note.

ABMQ = Autobiographical Memory Questionnaire

DPQ = Differential Personality Questionnaire

IDQ = Individual Differences Questionnaire

Logistic Regression Analysis for the Memory Creation as a Function of Duality.

---

<u>Variable</u>	<u>B</u>	<u>S.E</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
Duality	1.72	0.77	4.98	1	.2206	5.57 *
Constant	-0.74	0.37	4.05	1		*

---

\* $p \leq .05$ .

Logistic Regression Analysis for Memory Creation as a Function of the  
Hidden-observer Responses.

---

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
HOS	2.90	1.12	6.70	1	.277	18.18 *
Constant	- 0.82	0.36	5.15	1		*

---

\* $p \leq .05$ .

Note.

HOS = Hidden-observer, strict criteria



Logistic Regression Analysis of Memory Creation as a Function of Hypnotizability, Duality, and Cognitive Effort.

---

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
HGSHS	1.29	0.15	3.552	1	.159	1.34
Duality	1.62	0.85	3.59	1	.161	5.04
Effort 2	1.90	0.91	4.33	1	.195	6.70 *
Constant	-3.46	1.26	7.55	1		

---

\* $p \leq .05$

Note:

Effort2 = Cognitive effort for the second memory

HGSHS = Harvard scale for hypnotic ability

Logistic Regression Analysis for Memory Creation as a Function of Hypnotizability and Cognitive Effort, with Duality Omitted.

---

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>Exp(B)</u>
Effort 2	1.85	0.86	4.61	1	.2064	6.39 *
HGSHS	0.33	0.15	5.02	1	.2220	1.39 *
Constant	-3.21	1.19	7.34	1		

---

\* $p \leq .05$ .

Note.

HGSHS = Harvard scale for hypnotic ability

Appendix K

t-tests for Independent Samples for Memory Creation Groups on Four  
Dependent Measures.

<u>Variable</u>	<u>MS</u>		<u>t-value</u>	<u>df</u>	<u>2-tail sig.</u>
	<u>Bef</u>	<u>Aft</u>			
ABMQ (SE)	71.43 (2.32)	68.58 (4.65)	0.44	17	.662
DPQ (SE)	18.00 (3.21)	24.08 (5.16)	-2.80	17	.012*
IDQ (SE)	10.00 (2.57)	27.50 (2.12)	-5.14	17	.000*
HGSHS (SE)	4.57 (2.82)	5.66 (2.30)	-0.87	17	.370

\* $p \leq .025$ .

Note.

ABMQ = Autobiographical Memory Questionnaire

DPQ = Differential Personality Questionnaire

IDQ = Individual Differences Questionnaire

Bef = Memory creation before the hidden-observer

Aft = Memory creation after the hidden-observer

HGSHS = Harvard scale for hypnotic ability

Appendix L  
Logistic regression Analysis for Memory Creation as a Function of  
Memory Strength

Logistic Regression Analysis for Memory Creation with ABMQ and HGSHS as Predictors.

---

<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
ABMQ	0.01	0.02	0.07	1	.000	1.006
HGSH	0.21	0.13	2.44	1	.085	1.236
Constant	-1.69	1.53	1.21	1		

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\* $p \leq .05$ .

Note.

ABMQ = Autobiographical Memory Questionnaire

HGSHS = Harvard scale for hypnotic ability

Logistic Regression Analysis of Memory Creation as a Function of Hypnotizability.

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<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
HGSH	0.222	.129	2.97	1	.1259	1.25
Constant	- 1.34	.68	3.81	1		

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\* $p \leq .05$ .

Note.

HGSHS = Harvard scale for hypnotic ability

Appendix M

Source Table for Three-way ANOVA on Confidence in Memory with Memory Creation and Group Instructions as Factors

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Between Subjects			
Creation	1	25.13	27.42 *
Inst.	2	0.06	0.06
Creation x Inst.	2	0.67	0.73
within error	39	0.92	
Within Subjects			
Conf.	1	8.41	23.05 *
Creation x Conf.	1	18.51	50.75 *
Instructuin x Conf.	2	0.19	0.51
Creation x Inst x Conf.	2	1.12	3.07
within error	39	0.36	

\* $p \leq .05$

Note.

Conf. = Confidence

Inst. = Instruction groups

Appendix N  
Logistic Regression Analysis for Hidden-Observer with  
IDQ, DPQ, ABMQ, and HGSH as Predictors



Logistic Regression Analysis of the Hidden-Observer as Function of ABMQ,  
IDQ, DPQ, and HGSH.

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<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
IDQ	- 0.11	0.058	5.075	1	- .261	0.896 *
HGSHS	0.23	0.198	1.393	1	.000	1.263
DPQ	0.07	0.095	0.639	1	.000	1.079
ABMQ	0.05	0.037	1.681	1	.000	1.049
Constant	- 5.49	3.259	2.845	1		

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\* $p \leq .05$ .

Note.

IDQ = Individual Differences Questionnaire

DPQ = Differential Personality Questionnaire

ABMQ = Autobiographical Memory Questionnaire

HGSH = Harvard scale for hypnotic ability

Logistic Regression Analysis for the Hidden-Observer as a Function of ABMQ,  
DPQ, and the HGSH with the IDO Omitted.

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<u>Variable</u>	<u>B</u>	<u>S.E.</u>	<u>Wald</u>	<u>df</u>	<u>R</u>	<u>odds-ratio</u>
HGSH	0.22	0.18	1.543	1	.000	1.248
DPQ	- 0.00	0.08	0.000	1	.000	0.998
ABMQ	0.01	0.02	0.349	1	.000	1.017
Constant	- 3.62	2.36	2.349	1		

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\* $p \leq .05$ .

Note.

ABMQ = Autobiographical Memory Questionnaire

DPQ = Differential Personality Questionnaire

HGSH = Harvard scale for hypnotic ability