

# **INDIVIDUAL DIFFERENCES IN THE FORMATION OF FALSE MEMORIES: IS SUGGESTIBILITY A PREDICTIVE FACTOR?**

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## **Abstract**

Individual differences in the formation of false memories using suggestibility as a predictive factor were investigated. Undergraduate males and females were administered two false memory paradigms: the Deese-Roediger-McDermott (DRM) (1995) word recognition task and the Kassin & Kiechel (KK) ALT key task (1996). Subsequently, participants were administered the Gudjonsson Suggestibility Scale (GSS) 2 to determine their suggestibility scores. As predicted, higher suggestibility scores were correlated with forming a false memory in the Kassin & Kiechel task. However, suggestibility was not correlated with the DRM task. These results provide evidence that suggestibility is a predictive factor for one false memory paradigm but not the other, indicating that perhaps different cognitive mechanisms underlie the two.

## **Introduction**

Many people come to believe events which have never actually happened to them. What kinds of people are susceptible to this? This is a question currently being investigated in relation to the “False Memory Syndrome”. A false memory occurs when participants in an experiment come to remember an event which has never actually occurred (Loftus, 1997). Questions relating to false memory have recently received considerable attention from experimental psychologists; especially which factors might predict the formation of false memories (e.g. Loftus & Pickrell, 1995; Roediger & McDermott, 1995, Kassin & Kiechel, 1996; Loftus, 1997; Peiffer & Trull, 2000). This phenomenon has recently garnered attention due to its psycho-legal implications. This paper will examine whether suggestibility plays a role in the formation of false memories using two different false memory paradigms; one involving memory for words and the other involving memory for enduring events, such as an experience during childhood.

Research about false memories is important because of its psycho-legal applications pertaining to recovered memories, eyewitness questioning, and individual differences in the formation of false memories. Research on false memories has direct implications on the recent controversy about adults who recover memories of sexual abuse experienced during childhood. There is also evidence from the false memory literature that indicates that questioning techniques used on participants can alter their memories, thus indicating that similar experiences might occur to eyewitnesses based on police questioning techniques. Although research has shown that it is possible to implant

false memories in individuals, little is understood about what kind of individuals are more likely to form false memories. This is important because it is relevant to understanding what kinds of people might be more suggestible to false recovered memories of sexual abuse and alteration of memory for witnessed events.

### **Paradigms for False Memories**

A false memory can be operationally defined as a memory for a word that a participant has not been presented. This term can also pertain to memories for an event which has never occurred. There are different types of false memories explored in the laboratory, with qualitatively different experimental techniques used to induce them. Two particularly interesting paradigms are the Deese-Roediger-McDermott (DRM) (1995) paradigm and the Kassin & Kiechel (KK) (1996) paradigm. The DRM is a paradigm which produces formation of false memory for words, while the KK paradigm produces false memories for an enduring event.

The first type of false memory relates to explicit memory for words presented on a semantically related list, where participants subsequently recall or recognize non-presented words that are semantically related to presented words. One particular technique used to create this phenomenon is the (DRM) (1995) paradigm which shows that when participants study lists of words, they often falsely report recognizing a never presented associate word as appearing in the original list. This never presented word is called the critical lure. All of the words in the list are semantically associated with the critical lure. When asked whether or not participants “know” (are confident the word was presented but do not remember the actual presentation) or “remember” (are confident the word was presented and remember something about the actual presentation) that the never presented associate word was presented on the list, participants often claim that they remember the word (Roediger & McDermott, 1995). In this particular scenario, participants have a memory for a certain word which they think that they have heard, although in reality, this word has not been presented.

In numerous experiments, this word recognition task has been manipulated to try and reduce false memory effects. Gallo, Roberts, & Seamon (1997) found that warning participants about the false recognition effect reduced but did not eliminate the effect. Seamon, Luo, & Gallo (1998) showed that even without recognition of list items due to speed of presentation, participants formed false memories for the semantically associated critical lures. Both of these experiments indicate just how strong the DRM phenomenon is. The DRM paradigm has been widely recognized as an excellent way to produce false memories in a laboratory setting without creating a stressful situation for the participant, as well as excluding confounds present in other false memory tasks such as social demand and compliance. Many researchers argue that since participants claim to be confident in their memories for these words, that these false memories are as real as their memories for other presented words (e.g. Koriat, Goldsmith, & Pansky, 2000; Ghetti, Qin, & Goodman, 2002). Roediger & McDermott (1995) argue that false memories for words might even be relevant to enduring events, such that similar mechanisms might underlie the formation of the two kinds of false memories.

The second type of memory relevant for investigating the false memory syndrome is memory for enduring events. This has been implicated as an important research topic because of its psycho-legal applications pertaining to adults recovering memories of sexual abuse as a child. This type of memory involves recollections of personal events such as the wedding of a sibling, a first love, or a recent event in one's life. It seems that people can come to believe that entire events took place in their lifetime which actually never occurred, as the examples below will show. This occurs most frequently through misleading post event information which alters people's memory (Loftus & Pickerell, 1995).

Examples of the effects of misleading post event information come from early research. Loftus (1973) showed that people who witnessed an event that were exposed to leading questions or misleading information came to have distorted memories, such as the presence of broken glass at a car accident scene when in fact there was none. After this finding, researchers developed innovative paradigms to examine how malleable human memory is. For example, Loftus & Pickerell (1995) showed that after giving misleading information to participants, 29% came to believe that they were lost in a shopping mall at the age of 5. Hyman, Husband, & Billings (1995) showed that 20% of participants came to believe an event had occurred in their childhood such as a hospital visit when in fact, the event had never occurred. Some participants even made up specific details which they believed had occurred during this experience.

One particular study that is frequently cited in the false memory literature is Kassir & Kiechel's groundbreaking experiment (1996) which examined the role of social compliance in the formation of false memories for a specific event. Kassir & Kiechel showed that participants were more likely to form false memories when accused of experiencing the event by a confederate witness. In this paradigm, researchers asked their participants to type the letters they heard on a computer, but were asked not to press the ALT key because it was causing problems. After a minute of typing, the computer crashed as part of the design of the experiment. A distressed experimenter accused the participant of ruining all of his data by pressing the ALT key. Half of the participants were told by a confederate witness that they had witnessed the participant press the ALT key prior to the crash of the program. The other half of participants were not accused by the confederate witness. Kassir & Kiechel's results indicated that participants who were accused of hitting the ALT key by a confederate witness were more likely to sign a confession, internalize guilt, and confabulate details in their memory consistent with the events. The important measures in this experiment which relate to the formation of false memories are internalization of guilt and confabulation of details. These two variables indicate that participants did not just comply with the experimenter and admit to pressing the ALT key, but that they actually formed a memory about the event.

This experiment was an important one in three different ways. First of all, it indicated that social compliance was an important factor in whether or not someone thought they pressed the ALT key since presence of a confederate witness produced more robust results. Secondly, the participants' confabulation of details such as which letter they pressed before the ALT key indicated that their memory had been altered. Thirdly, the results indicated that social stressors played a role in the formation of false memories, a mechanism which has not been examined in relation to the DRM. This raises an

interesting question regarding whether or not a memory for an enduring event is different from a memory for a word.

At this point, there is little dissention that false memories can be formed in participants (Loftus, 1997). However, an interesting question that researchers have given little attention to is: What kinds of people and character traits are susceptible to this syndrome? Other researchers have posed this question, yet few have undertaken its investigation.

## **Suggestibility**

A method for measuring suggestibility emanates from Gudjonsson's research. It works based on the assumption that an individual's suggestibility is due to his or her cognitive coping strategies during interviews. Situational variables such as questioning techniques can affect whether or not certain people respond to misleading information or questions (Gudjonsson, 1987). One recognized scale for measuring suggestibility is the Gudjonsson Suggestibility Scale 2 (1997). It has been measured as being both reliable and valid in detecting suggestibility (Liebman et al., 2002). Clare, Gudjonsson, Rutter, & Cross (1994) found the GSS 2 to have high inter rater reliability (as cited in Gudjonsson, 1997). Evidence on validity of the GSS 2 comes from Sirgurdsson & Gudjonsson (1996) who found that scoring high on the GSS 2 was correlated with more suggestible behavior in Icelandic inmates (as cited in Gudjonsson, 1997).

Peiffer & Trull (2000) examined suggestibility (as measured by GSS 2 Total Score) and its link to the formation of false memories in the DRM paradigm. The results of this experiment indicated that there was no relationship between the DRM and suggestibility because the analysis showed no statistical significance. However, no researchers have replicated the work of Peiffer & Trull. Because Peiffer & Trull's was the first study of its kind, replication is necessary in order to validate the null results. Since the question of the effect of individual differences on the formation of false memories still remains, it is important to replicate Peiffer & Trull's (2000) study to ensure that their results are both valid and reliable. It does not make sense to rule out suggestibility as a predictive factor based on the results of one study.

When examining the correlation between suggestibility and formation of false memories, Peiffer & Trull (2000) ignored the second type of false memory which has been very important in the research of false memories: memory for enduring events. Until now, a lack of research has looked at the link between suggestibility and the formation of false memories in paradigms such as Kassin & Kiechel's (1996). Thus, in the following experiment, I explore suggestibility in terms of the DRM (1995) paradigm and the KK (1996) paradigm in a synthesis of tasks.

The reasons for my experiment are two fold. First, to replicate Peiffer & Trull's (2000) findings showing that suggestibility is not related to the DRM paradigm. Second, to examine whether suggestibility is linked to the KK (1996) paradigm, as this relationship has never been investigated before. Reasons for a possible relationship between suggestibility and the KK paradigm include that social compliance is a component of suggestibility (Gudjonsson, 1989).

There are three possible outcomes for this experiment. First, it may be that suggestibility is not related to the formation of false memories in either of these

paradigms indicating that more research is necessary to understand how the two paradigms relate to one another. Second, suggestibility may be correlated with one task and not the other task, indicating that these two types of false memories do not have similar underlying cognitive mechanisms. Third, suggestibility may be correlated with both tasks, indicating that the two false memories have similar underlying cognitive mechanisms.

If suggestibility is related with either the DRM task or the KK paradigm, I predict that higher suggestibility scores will have a positive relationship with the formation of false memories.

## **Method**

### **Participants**

Forty-five students from an introductory psychology class (33 female, 12 male) ranging from ages 17 to 22 received 1 hour of credit for their participation.

### **Materials**

Suggestibility was assessed using the Gudjonsson Suggestibility Scale 2 (1997). The GSS included administering a story on a tape recorder followed by free recall. Twenty minutes later, 20 questions were asked of the participants. These two types of questions consisted of 5 control questions and 15 misleading questions. The control questions included questions such as (Was the boy's name William?). The 15 misleading questions consisting of three different forms. The misleading questions included leading questions (e.g. "Was the boy frightened of the big van coming up the hill? when a van was not mentioned), affirmative questions (e.g. "Was the boy allowed to stay away from school on the day of the accident?" when it was summer vacation), and false alternative questions (e.g. "Did the boy on the bicycle pass a stop sign or traffic lights?" when neither was present) (Liebman et al., 2002). After participants were asked these 20 questions, they were given negative feedback and told that they would have to answer the questions again. Scoring was based on participant's affirmative responses to the 15 misleading questions (Yield 1) and whether or not they changed their answers on their second responses after being told they answered incorrectly the first time (Shift). Thus GSS 2 total score was comprised of Yield 1+Shift (Gudjonsson, 1997).

Materials for the DRM (1995) paradigm consisted of six lists of 15 words. Each list took approximately 30 seconds to play. The six lists are included in Appendix 1. Participants were asked to recall the words that they heard after each list was played (see Appendix 2). Participants were then given 192 words (90 *old words*, 6 *critical lures*, and 96 *new words*). The 90 old words were the ones which they had heard played on the tape recorder for them and comprised the six different lists. The six critical lures were the words which were semantically associated with each list but not presented. The 96 new words were chosen at random from a dictionary to match the presented words on length. Participants were then asked to identify whether words were old or new.

Materials for the KK (1996) paradigm consisted of an IBM compatible machine with a customized typing program that was designed to crash. Prior to the experiment, participants were given a questionnaire asking about typing skills (see Appendix 3). After

the program crashed, participants were given a questionnaire asking them to elaborate on what happened while they were typing (see Appendix 4).

### **Procedure**

Participants who took part in this experiment were administered the GSS 2 Scale (1997), the DRM (1995) paradigm, and an adapted version of the KK (1996) paradigm.

Participants were administered the GSS 2 story on a tape recorder. Participants were then immediately asked to provide free recall on what they had heard. While usually the free recall portion of the GSS 2 is a spoken recollection of the story, a written recall was used. This is because immediate recall was not relevant for suggestibility scores, and thus not relevant to this experiment.

Participants were then administered the DRM (1995) paradigm. Participants were instructed that they would hear lists of words from a recording device and then be tested on free recall of each list by writing down the words read to them. Participants were given each of the six lists and after each they were allowed as much time as they needed to recall any words they could remember.

After the six lists had been administered, participants were told they would receive a packet of words. For each listed word in this packet, participants were asked to circle new if they saw a word that they had not heard in the previous portion of the study, or to circle old if it was a word that they had previously heard. If they thought it was an old word, participants were instructed as follows. If they generally knew that the word was on one of the original lists but couldn't remember the original presentation, they were told to circle 'K' (know). If they not only knew the word was on the original list and remembered the actual presentation of the word, then they were told to circle 'R' (remember). This part of the task was used by DRM to explore the nature of false recognition and memory.

After the word task was completed, participants were informed that they would answer questions on the story which they heard at the beginning of the experiment. After administration of these questions, participants were then informed that they had answered some of the questions incorrectly and would therefore have to answer all 20 questions again.

After answering the questions, participants were given a brief typing questionnaire to enhance the credibility of the Kassin & Kiechel aspect of the experiment. Following completion of the questionnaire, participants were instructed to type the letters flashing on the screen in front of them. They were given additional instruction not to press the ALT key as it had been causing the computer to crash on previous trials. The participants pressed enter to begin and went through easy (slow letters flashing), medium, and hard blocks (very fast letters flashing) of letters. The reason for this manipulation is due to Kassin & Kiechel's (1996) results which indicated that a fast typing speed was more likely to induce false memories in participants. In hard block #2, the computer crashed reading "Error 278: Contact programmer". At that point, the experimenter said "You might have pressed the ALT key. Please fill out this questionnaire stating what happened while you were typing so I can give it to the programmer and he can try to fix the problem." The questionnaire asked two questions. The first asked whether or not the participant pressed the ALT key to assess internalization of guilt. The second asked where in the sequence the participant pressed the ALT key to assess confabulation. Once

the participants handed in their questionnaires, they were thanked and debriefed about the purpose of the experiment.

## Results

Pearson correlation coefficients and t-tests were performed to evaluate the relationship between suggestibility and the various relevant measures of memory as measured by the DRM (1995) paradigm as well as behavior on the KK (1996) paradigm

To examine the relationship between GSS 2 total and the relevant variables of the DRM paradigm, Pearson Correlation Coefficients were calculated. These correlations were calculated to determine if suggestibility (as measured by GSS total) would predict performance on the relevant dependent variables of the DRM paradigm; number of critical lures recalled and percentage of critical lures recognized as old. There was no significant relationship between GSS 2 total and critical lures recalled,  $r(45)=.08, p=.30$ . There was also no significant statistical finding between GSS 2 total and number of critical lures recognized as old,  $r(45)=.06, p=.35$ . None of these relationships were statistically significant demonstrating that high suggestibility is not related to the formation of false memories in the standard DRM paradigm.

To examine whether or not participants formed a false memory of pressing the ALT key and the relation to suggestibility, independent groups t-tests were performed between those who admitted to pressing the ALT key and those who did not admit pressing the ALT key. The only significant result was that GSS 2 total scores were higher for participants who admitted to pressing the ALT key ( $M=13.87, SD=4.72$ ) versus those who said they did not press the ALT key ( $M=11.17, SD=4.69$ ),  $t(43)=1.82, p=.038$ . Stating that one had a memory for pressing the ALT key ( $M=3.13, SD=1.13$ ) and that one did not have a memory for pressing the ALT key ( $M=2.90, SD=1.40$ ) was not significant in relation to critical lures recalled,  $t(43)=-.56, p=.58$ . In addition, stating that one had a memory for pressing the ALT key ( $M=.922, SD=.12$ ) and that one did not have a memory for pressing the ALT key ( $M=.906, SD=.15$ ) was not significant in relation to the percentage of critical lures recognized as old,  $t(43)=.37, p=.40$ .

## Discussion

The results show that suggestibility is related to behavior in the KK (1996) paradigm but not the DRM (1995) false memory paradigm. Specifically, higher levels of suggestibility were associated with performance on the KK (1996) paradigm such that the mean GSS scores for participants who admitted to pressing the ALT key were higher than the mean GSS scores of those participants who denied pressing the ALT key. Conversely, GSS 2 scores were not related to the formation of false recall or false recognition in the DRM paradigm. A question which necessarily emerges from this finding is why suggestibility affects the KK paradigm but not the DRM paradigm. Both paradigms are frequently cited in the false memory literature as examples of techniques used in experiments to produce false memories.

It is necessary to understand how a false memory is formed in the DRM paradigm in order to assess what role suggestibility might play in that formation. There are three possible models that try and explain how the DRM paradigm works. For example,

Johnson's source monitoring model (1993) suggests that false memories are produced by the failure to attribute the source of information from the correct area. Recognition and recall both cause the participant to identify where the source of that information comes from, and false memories are formed when internally derived information such as an inference about a word is confused with an external source, such as studying the word in a list (Ghetti et. al., 2002). Semantic association is another model that attempts to explain how a false memory occurs in the DRM task is semantic association. Underwood (1965) proposes that false recognition responses occur during encoding by the following process. When participants see a word such as hot, they might think of its semantic associate, cold. Later, if cold is presented as a critical lure, then the participant might have a memory of seeing the word cold due to their recognition response (as cited by Roediger & McDermott, 1995). This effect should be even more robust when using lists of semantically related words, and this is in fact the case (Roediger & McDermott, 1995). A third model proposes that perceptual elaboration might be the causal mechanism when participants engage in the DRM paradigm. This model proposes that participants imagine the associated words while performing the DRM paradigm, leading many participants to claim that they "remember" words that are not presented (Drivdahl & Zaragoza, 2001). All of the above models are logical ways in which to understand how the DRM task causes individuals to form false memories, and research has not yet established which one is most valid.

It is important to note that the above mechanisms may not play a role in the type of false memory produced by the KK (1996) paradigm. In this paradigm, participants do in fact have altered memories due to their internalization and confabulation regarding the pressing of the ALT key. However, the cognitive mechanisms that produce these false memories may be different than those that produce false memories in the DRM paradigm. Unfortunately, it is unknown at this time what the cognitive mechanisms underlying the KK response may be. One implicated is social compliance (Kassin & Kiechel, 1996). Social compliance can be operationally defined in this experiment as behaving in a compliant manner towards the experimenter. Perhaps during the Kassin & Kiechel paradigm, compliance is the reason that participants admit to pressing the ALT key. However, this compliance may be eventually turned into a false memory.

An interesting question is what underlying mechanism turns this compliance into a false memory. Two plausible explanations are cognitive dissonance (Festinger, 1957) or self perception (Bem, 1967). These mechanisms may force the participants to believe that if they said they pressed the ALT key, then they must have in fact pressed the ALT key. A third explanation for the formation of a false memory in the KK paradigm could involve source monitoring (Johnson, 1993). Once a participant admits to pressing the ALT key, the participant may later come to believe that they pressed the key because they can't remember what source their information is coming from: complying in saying that they pressed the ALT key, or actually believing that they pressed it. While it is interesting to examine what underlying cognitive mechanisms cause participants to believe they pressed the ALT key, social compliance seems to be the primary mechanism of the situation (Kassin & Kiechel, 1996). Perhaps, the KK task (1996) should no longer be recognized as a purely "false memory" paradigm and be reclassified as an experiment in social compliance.

The results of the present experiment indicate that in addition to social compliance, suggestibility is an important factor in predicting whether or not a participant will form a memory of pressing the ALT key.

Suggestibility is generally defined as one's susceptibility to misleading information (Gudjonsson, 1984). However, Eysenck (1991) has suggested that suggestibility is a multi-faceted entity and not one uniform dimension (as cited in Liebman et. al., 2002). Different individual difference factors of suggestibility include intelligence (Gudjonsson, 1988), social desirability (Gudjonsson, 1983), memory (Gudjonsson, 1987), acquiescence (Gudjonsson, 1986), compliance (Gudjonsson, 1989), and disassociation (Eisen et. al., 2001).

Three important components of suggestibility for this experiment include disassociation, acquiescence, and compliance. Putnam (1997) has investigated dissociative people and memory. He defined dissociative individuals as those who are unsure of themselves and do not have stable images of themselves. He found that highly dissociative persons were less confident in their memory, which made them more vulnerable to misleading information (as cited in Eisen et. al., 2001). This lack of confidence is relevant to both the DRM and KK paradigms. Someone with high dissociation should be less confident in their memory for both a word task (DRM) as well as the ALT key task (KK).

The other two individual differences of suggestibility that are relevant to this experiment are acquiescence and compliance (Eisen et. al., 2001). Acquiescence has been defined as a willingness to give in to other individuals (Eisen et. al., 2001). This personality trait is relevant to suggestibility because perhaps some of the participants were just more likely to give in to saying they pressed the ALT key, rather than really forming a memory for it.

Social compliance is also a key part of the KK (1996) experiment. Ghetti argues that tasks such as the ALT key paradigm involve social compliance and are stressors for the participants, thus not being exclusively false memory paradigms such as the DRM (2002). Loftus (1997) agrees that external factors such as social compliance and demands do play a role in the formation of these types of real world memories. Both of these constructs would affect the KK (1996) task much more strongly than the DRM (1995) task and thus make it clearer why suggestibility had a stronger relationship with the ALT key task (1996) versus the DRM (1995) task. This indicates that there are different individual factors within suggestibility which affect its relation with the KK (1996) paradigm, which in turn indicate that there might be different cognitive mechanisms occurring in this paradigm when comparing it to the DRM (1995).

An important consideration which has been heavily debated throughout the literature is whether or not the DRM paradigm has any relevance to the psycho-legal debates about recovered, repressed, and false memories. Roediger & McDermott (1995) argue that since remembering words is a memory event, then perhaps the same mechanisms occur for remembering an actual event. These researchers also argue that their results were produced using a lab paradigm which generally causes very few errors with college students, who are "professional memorizers". Because memory is so relevant to college students, their formation of false memories is very compelling. However, not all researchers are convinced by the DRM (1995) link between false memories for words and events. Some researchers think that making this link is

inappropriate due to the units of analysis (Freyd & Gleaves, 1996). In essence, these researchers argue that false memories for words and events are not the same. However, Freyd & Gleaves do not extrapolate on what kinds of mechanisms might make these two kinds of memories different.

This experiment is the first of its kind to show that different predictive factors may underlie the two false memories, which point to the hypothesis that different cognitive mechanisms underlie different types of false memories. Words which have little emotional and no social context for a participant differ from events which include factors such as social compliance. Future research should try and separate out social compliance and other external factors from any of the experimental false memory paradigms for events such as the KK (1996) paradigm.

While the results of this experiment are encouraging in demonstrating that there are different types of false memories that have different underlying cognitive mechanisms, they must be taken with caution. First of all, the effect size is weak due to the small sample size ( $\eta^2=.07$ ). More participants need to be run in order to produce stronger results. In addition, there were many more female participants run in this experiment than male participants, which was also a problem in Peiffer & Trull (2000). Tousignant (1984) has demonstrated that women tend to be more suggestible (as cited in Peiffer & Trull, 2000). A more balanced group of participants across gender would make the results more valid. Similarly, Ceci & Bruck (1995) have shown children to have a higher rate of formation of false memories. Gudjonsson (1997) has also shown children to be more suggestible. Comparing different age groups could be an interesting extension of this study. There is also not a lot of variability in college students in terms of suggestibility, and it is important that future studies look at different populations as it is difficult to generalize from college students. Finally, I was not a masked researcher, and was aware of suggestibility scores simply by administering the GSS to my participants. It must be taken into account that experimenter expectancy effects might have occurred. In the future, a researcher masked to conditions should administer the GSS. However, the findings are still relevant and need replication.

In addition, to really extend my research, it would be interesting to see if there is a way to administer the DRM task with a confederate present to see if this would exert social compliance upon the participants (Wright, Self, & Justice, 2000). In that situation, perhaps the GSS 2 scale would be a more useful tool in determining whether or not the formation of false memories in the DRM task is linked to suggestibility. However, it must be recognized that the GSS 2 scale and suggestibility may not be relevant to the DRM task, and future research could also focus on further understanding for exactly what cognitive mechanisms underlie both the DRM task (1995) and the KK task (1996).

After replicating the results of Peiffer & Trull (2000), it seems clear that suggestibility does not play a role in the DRM task. What are the predictive factors which may underlie the DRM paradigm? Future research to investigate what types of people are more likely to form this type of false memory is necessary. Results indicate that suggestibility is linked with the KK task, and future research is needed to replicate these results. However, if these results are in fact true, then they have serious psycho-legal implications. If the results are supported in future research, then the GSS 1 and 2 should not be administered to individuals who claim to have a false memory unless some aspect of this false memory has to do with social compliance, such as a witness being prodded

by a police officer to remember an event. It should also be brought to the attention of police officers that their questioning techniques, especially on highly suggestive witnesses may alter the person's memory permanently, so that one may come to believe something which is not true. Due to the serious legal implications concerning eyewitness memory as well as the controversy over repressed sexual memory, future research is imperative.

## References

- Bem, D. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74, 183-200.
- Deese, J. (1959). On the prediction of occurrence of particular verbal intrusions in immediate recall. *Journal of Experimental Psychology*, 58, 17-22.
- Drivdahl, S., & Zaragoza, M. (2001) The role of perceptual elaboration and individual differences in the creation of false memories for suggested events. *Applied Cognitive Psychology*, 15, 265-281.
- Eisen, M., Morgan, D., & Mickes, L. (2002). Individual differences in eyewitness memory and suggestibility: examining relations between acquiescence, dissociation and resistance to misleading information. *Personality and Individual Differences*, 33, 553-571.
- Festinger, L. (1957). A theory of cognitive dissonance. Stanford, CA: Stanford University Press.
- Freyd, J., & Gleaves, D. (1996). "Remembering" words not presented in lists: Relevance to the current recovered/false memory controversy. *Journal of Experimental Psychology*, 22, 811-813.
- Gallo, D., Roberts, R., & Seamon, J. (1997). Remembering words not presented in lists: Can we avoid creating false memories? *Psychonomic Bulletin Review*, 4, 271-276.
- Ghetti, S., Qin, J., & Goodman, G. (2002). False memories in children and adults: Age, distinctiveness, and subjective experience. *Developmental Psychology*, 38, 705-718.
- Gudjonsson, G. (1983). Suggestibility, intelligence, memory recall and personality. An experimental study. *British Journal of Psychiatry*, 142, 35-37.
- Gudjonsson, G. (1984). A new scale of interrogative suggestibility. *Personality and Individual Differences*, 5, 303-314.
- Gudjonsson, G. (1986). The relationship between interrogative suggestibility and acquiescence: Empirical findings and theoretical implications. *Personality and Individual Differences*, 7, 195-99.
- Gudjonsson, G. (1987). The relationship between memory and suggestibility. *Social Behavior*, 2, 29-33.
- Gudjonsson, G. (1988). The relationship of intelligence and memory to interrogative

- suggestibility: The importance of range effects. *British Journal of Clinical Psychology*, 27, 185-187.
- Gudjonsson, G. (1989). Compliance in an interrogative situation: A new scale. *Personality & Individual Differences*, 10, 535-540.
- Gudjonsson, G. (1997). *The Gudjonsson suggestibility scales-manual*. Hove: Psychology Press.
- Hyman, I., Husband, T., & Billings, F. (1995). False memories of childhood experiences. *Applied Cognitive Psychology*, 9, 181-195.
- Kassin, S., & Kiechel, K. (1996). The social psychology of false confessions: Compliance, internalization, and confabulation. *Psychological Science*, 7, 125-128.
- Koriat, A., Goldsmith, M., & Pansky, A. (2000). Toward a psychology of memory accuracy. *Annual Review of Psychology*, 51, 481-537.
- Johnson, M., Hastroudi, S., & Lindsay, D. (1993). Source monitoring. *Psychological Bulletin*, 114, 3-28.
- Lampinen, H., Neuschatz, J., & Payne, D. (1999). Source attributions and false memories: A test of the demand characteristics account. *Psychonomic Bulletin and Review*, 6, 130-135.
- Liebman, J., et. al. (2002). Cognitive and psychosocial correlates of adults' eyewitness accuracy and suggestibility. *Personality and Individual Differences*, 33, 49-66.
- Loftus, E. (1997). Creating false memories. *Scientific American*, 277, 1-7.
- Loftus, E., & Pickerell, J. (1995). The formation of false memories. *Psychiatric Annals*, 25, 720-725.
- Peiffer, L., & Trull, T. (2000). Predictors of suggestibility and false-memory production in young adult women. *Journal of Personality Assessment*, 74, 384-399.
- Roediger, H., & McDermott, K. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology*, 21, 803-814.
- Roediger, H., & McDermott, K. (1996). False perceptions of false memories. *Journal of Experimental Psychology*, 22, 814-816.
- Seamon, J., Luo, C., & Gallo, D. (1998). Creating false memories of words with or without recognition of list items: Evidence for nonconscious processes. *Psychological Science*, 9, 20-26.
- Wright, D., Self, G., & Justice, C. (2000). Memory conformity: Exploring misinformation effects when presented by another person. *The British Journal of Psychology*, 91, 189-202.

Appendix 1

The Six 15-Word Lists Used in Experiment

<b>Chair</b>	<b>Mountain</b>	<b>Needle</b>	<b>Rough</b>	<b>Sleep</b>	<b>Sweet</b>
table	hills	Thread	smooth	bed	sour
sit	valley	pin	bumpy	rest	candy
legs	climb	eye	road	awake	sugar
seat	summit	sewing	tough	tired	bitter
couch	top	sharp	sandpaper	dream	good
desk	molehill	point	jagged	wake	taste
recliner	peak	prick	ready	snooze	tooth
sofa	plain	thimble	coarse	blanket	nice
wood	glacier	haystack	uneven	doze	honey
cushion	goat	thorn	riders	slumber	soda
swivel	bike	hurt	rugged	snore	chocolate
stool	climber	injection	sand	nap	heart
sitting	range	syringe	boards	peace	cake
rocking	seep	cloth	ground	yawn	tart
bench	ski	knitting	gravel	drowsy	pie

Appendix 2

List 1

List 2

List 3

List 4

List 5

List 6

## Appendix 3

### Typing Skills: Questionnaire One

Please answer the questions below **to the best of your ability**. They are designed to access your typing capabilities.

- 1) At what age did you learn how to type (approximate)?
  
- 2) How did you learn to type (e.g. typing program, classroom, etc)?
  
- 3) Approximately, how many words per minute do you type?
  
- 4) Approximately, how accurately do you type?
  
- 5) Can you type without looking at the keyboard?

Thank you very much for your cooperation. These data will supplement the actual hands on typing you will be doing shortly.

## Appendix 4

1) What happened when you were on the computer?

2) Did you press the ALT key? (If yes, after this question go to #3. If not, go on to question #4)

3) Can you remember where in the sequence you hit the ALT key?

4) Please contribute any additional comments you might have.

Thank you very much for your cooperation. Please seal this in the envelope and hand it to the experimenter.

