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Planting the Seeds of Doubt: How Memory Reactivation and Interrogation Tactics
Influence Internalized False Confessions

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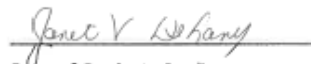
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Abstract

Planting the Seeds of Doubt: How Memory Reactivation and Interrogation Tactics Influence Coerced-Internalized False Confessions

Christopher J. Normile

In a study of false confessions, Kassin and Kiechel (1996) found that 28% of participants came to believe they committed a transgression they did not commit. One explanation for false confessions is reconsolidation, which describes the process of reactivating a memory and then storing it again in memory. Misleading information given during reactivation can supplant the original memory, thereby producing a false memory. The current study combined standard false confession and reconsolidation paradigms to test the effects of reactivation and psychologically coercive interrogation tactics on the frequency of compliance and internalization of guilt. Participants who underwent reactivation were no more likely to falsely confess than those who did not. Furthermore, reactivation did not increase the likelihood of internalizing guilt. Participants exposed to coercive tactics signed a confession more often than those who were not. Surprisingly, exposure to coercive tactics increased internalization rates. Explanations regarding memory distinctiveness and plausibility are discussed.

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Chapter One:

Introduction

The number of criminal acts within the United States is alarmingly high. In 2012 alone, there were approximately one million violent crimes committed in the United States (The Federal Bureau of Investigation, 2012a) -- 50% of which resulted in the arrest of a suspect (The Federal Bureau of Investigation, 2012b). While finding a suspect is critical when it comes to solving a crime, the steps law enforcement officers take between investigation and trial may be even more important. During an investigation, individuals may be interviewed or even interrogated. Furthermore, some may even confess to a crime they did not commit. Since 1989, the Innocence Project -- a public policy group that uses DNA testing to exonerate innocent people who have been convicted of crimes -- has assisted in the release of 325 people (Innocence Project, 2015). Approximately 27% of those exonerated by the Innocence Project were convicted due to a false confession (The Innocence Project, 2015). As a result, researchers have conducted studies over the last few decades in order to understand why some innocent people confess to crimes that they did not commit (Kassin & Kiechel, 1996; Kassin & Wrightsman, 1985; Russano, Meissner, Narchet, & Kassin, 2005). In order to understand the false confession literature, one must first understand what constitutes a false confession.

False Confessions

False confessions occur when a suspect confesses to a crime they did not commit. Kassin and Wrightsman (1985) identified three types of false confessions: (a) voluntary, (b) coerced-compliant, and (c) coerced-internalized. Voluntary false confessions occur when an individual admits to committing a crime with no influence from interrogators; such confessions are typically seen in high profile cases, where the confessor is seeking notoriety. A second type of

confession is a coerced-compliant confession, in which the suspect falsely confesses to a crime in order to escape the stress and pressure of an interrogation, even though they know they are innocent. For example, suspects who are interrogated for over 10 hours may eventually falsely confess to a crime because they are tired, experiencing stress, and/or are told that their confession will carry no negative consequences.

A third type of confession is a coerced-internalized false confession, which occurs when the suspect confesses to a crime and sincerely begins to believe that they are guilty of the crime; the suspect internalizes the guilt and begins associating oneself with being a part of the crime. Internalized false confessions have been found in both laboratory settings (Kassin & Kiechel, 1996) and in real-world cases (Innocence Project, 2015). One topic that interests researchers is how coerced-internalized confessions occur. Those who internalize the guilt do not confess solely to escape an aversive environment like the coerced-compliant confessors. Rather, they actually begin to have memories of committing the crime, even if they were not involved in any way. One possible explanation for why this internalization occurs may stem from the methods used during interrogations.

Interrogation Methods

During an interrogation, police officers are trained to use a variety of tactics to get a suspect to confess. These tactics include, but are not limited to, introducing false evidence, the minimization technique, and the use of deals (Kassin, 2014). The *minimization technique* is when interrogators attempt to minimize or rationalize the crime for the suspect. In some cases the police may blame the victim (e.g., “they probably had it coming”), they might say the suspect just was not in the right state of mind (e.g., “you were probably drunk.”) or they might agree with what the suspect did (e.g., “I might have hurt them too if they did that to me”). While these

tactics can be successful in eliciting a confession from guilty suspects, they may also elicit false confessions from innocent suspects. For example, suspects might falsely confess to a crime due to the presentation of false evidence during an interrogation (Chapman, 2013). The false evidence that can be introduced ranges from saying that another “accomplice” already confessed to stating that the suspect failed a polygraph test when they passed (*Frazier v. Cupp*, 1969). It should be noted that what the police are doing in these instances is legal. According to *Frazier v. Cupp*, all confessions made, even those that were obtained through the use of false evidence tactics, are admissible in court.

Minimization is problematic insofar as it implies that suspects might receive a lesser (or no) penalty if they confess to the crime (Kassin & Kiechel, 1996; Kassin & McNall, 1991). For those who give a false confession, they may confess because they see it as the only way to remove themselves from an aversive environment, and they would rather take a lighter prison sentence than to continue being subjected to long, stressful interrogations. Of course, the police may not have the power to grant such leniency. As a result, leniency in exchange for a confession is not guaranteed. Inbau, Reid, Buckley, and Jayne (2001) advocate for the use of minimization, but they stress that interrogators should be cautious and not allow the suspect to think that the minimization of guilt will lead to a lighter punishment. However, it remains unknown whether minimization tactics are more likely to lead to internalized confessions rather than compliant confessions. Rather, suspects who internalize guilt begin to believe that they committed the crime even though they are innocent (Kassin & Kiechel, 1996). As a result, it is important for researchers to investigate how other factors may play a part in false confessions.

Research on False Confessions

Kassin and Kiechel (1996) developed a research paradigm (i.e., the computer crashing paradigm) to test whether or not they can get people to falsely admit to committing a crime. Kassin and Kiechel told participants they would be engaging in a study on typing speed. After about 3 min, the participant and confederate would switch roles. Before beginning the experiment, the participants were told to avoid hitting the ALT key on the keyboard, which would cause the computer to crash. One minute into the experiment, the computer crashed. The experimenter then blamed the participant for pressing the key and an interrogation ensued. During the interrogation the experimenter measured three behaviors/outcomes: (1) compliance (i.e., whether participants would sign a confession form); (2) internalization (i.e., whether participants appeared to believe that they had caused the computer to crash); and (3) confabulation (i.e., whether they provided a story to explain how they hit the ALT key) by asking the participant to explain what they were doing before they pressed the button. If the participant signed the hand-written confession form, then they complied with the demands of the experimenter, thus seemingly admitting guilt. With internalization, a second confederate asked the participant why the head experimenter was so angry. By saying “I ruined the experiment” rather than “The researcher thinks I ruined the experiment” they showed signs of guilt. Finally, confabulating an entire story on how they went about hitting the ALT key provided evidence that the participant believed that they did cause the computer to crash. In the end, 68% of participants complied by signing the confession form, 28% internalized guilt, and 9% confabulated details about the “crime.”

Kassin and Kiechel's (1996) experiment showed the importance of certain factors including the difficulty of the task and false eyewitness accounts which may affect the likelihood

of receiving a false confession during an interrogation. Many other experiments have studied other factors related to false confessions, including the age of the suspect (Redlich & Goodman, 2003), personality differences (Horselenberg, Merckelbach, & Joseph, 2003), and the use of the minimization technique (Klaver, Lee, & Rose, 2008). Others, such as Russano et al. (2005), developed their own paradigms to study false confessions.

Russano et al. (2005) designed an experiment to research the factors that affect the likelihood of eliciting a false confession from an innocent suspect (i.e., the cheating paradigm). One factor that Russano et al. investigated was how minimization and the use of deals might affect the likelihood of eliciting false confessions. In their study, participants completed a set of logic puzzles. Some puzzles were to be solved independently, and others were to be solved with a partner. During this task, a confederate asked the participant for help in solving one of the problems if the participant was assigned to the guilty condition. If the participants were assigned to the innocent condition, the confederate did not ask for help. After completing this task, the experimenter took the confederate out of the room and accused the participant of cheating during the task. At that point, the experimenter engaged in an interrogation -- which for some included minimization, deals, or both. Overall, innocent participants were most likely to confess when they were interrogated using minimization tactics and offered a deal (43%). The participants who were innocent and had no tactics used against them were the least likely to confess (6%). This study showed that the tactics used by interrogators, while increasing the likelihood of getting a true confession, also increased the likelihood of getting a false confession.

In summary, previous research has shown that false confessions are indeed possible, and that innocent individuals can falsely confess under certain social and environmental conditions. While researchers now understand why false confessions occur, it is equally important to

discover the underlying social and cognitive processes that impact false confession rates in order to reduce their incidence.

One explanation for coerced-internalized false confessions in particular may be that exposure to misleading post-event information after an event has occurred is enough to affect a person's memory for the original event (Belli, 1989; Loftus, Miller, & Burns, 1978; Tversky & Tuchin, 1989). Loftus et al. referred to this phenomenon as the *misinformation effect*. Distortions of memories may be involved with the internalization of guilt seen in coerced-internalized false confessions because information during investigative interviews may distort a suspect's memory for details about the crime.

Misinformation Effect

The misinformation effect was described in detail by Loftus et al. (1978) and occurs when information presented after witnessing an event (i.e., post-event information) is later remembered as what was originally witnessed. Loftus et al. tested over 1,000 participants across five experiments. The participants watched a slide show depicting a car stopping at a stop sign (or a yield sign). The rest of the slides showed that the car hit a pedestrian as they were trying to cross the crosswalk. Then, the experimenter asked the participants, "Did another car pass the red Datsun while it was stopped at the stop sign?" (p. 20). Half the participants were provided with correct information (i.e., the question asked about a stop sign, and they saw a stop sign in the slides) whereas the other half were provided misinformation (i.e., they were asked about the stop sign, but saw a yield sign). Results showed that information given after the event affected how the person later recalled the memory. That is to say, participants given misleading post-event information were more likely to incorrectly recall seeing a stop sign compared to those who were given correct post-event information. Loftus et al. provided two possible explanations as to why

some participants had false recollections. The first explanation was that the original memory was replaced by the new information provided by the misleading post-event information. The second explanation stated that both the new and old information were intact within memory but that the new memory competed with the old memory leading to retrieval inhibition of the original information.

In addition to the findings that misleading post-event information can affect memory, research has shown that people claim to remember suggested, false memories with similar confidence levels as actual, original memories (Tversky & Tuchin, 1989). In other words, individuals are likely to believe that post-event information is true, even when the information is misleading. Acceptance of the misleading information is even more likely to occur if the event being recalled is an event that induces a high level of stress (Morgan, Southwick, Steffian, Hazlett, & Loftus, 2013).

In addition to the idea that stress influences acceptance of misleading information, Belli (1989) conducted a study on the influences of misleading post-event information on memory. His participants watched a slide show consisting of a man stealing money and a calculator, along with four key items that appeared (i.e., a particular brand of coffee, soda, a magazine, a tool). After a brief filler task, participants read a narrative based on the slide show they watched previously, but the narrative contained misleading information about the key items from the slideshow (i.e., if the slide show showed a can of 7-up, the narrative mentioned it was a can of Pepsi). After reading the narrative, participants completed another filler task, followed by a recognition task, in which they responded “yes” or “no” to sentences asking if particular items were shown during the slideshow. More specifically, Belli found that participants who were given misleading information in the written narrative were more likely to recall the false items

appearing during the slideshow compared to those in the control group. Like Loftus et al. (1978), Belli concluded that misleading post-event information can cause interference in memory for original.

In sum, asking leading questions can alter how an eyewitness recalls information (Belli, 1989; Loftus et al., 1978, Loftus & Palmer, 1974). Similarly, interrogators may provide misleading information about an event experienced by a criminal suspect. By creating a vivid mental image, the interviewees may have a difficult time distinguishing between actual events and the events experienced only in their imagination as a result of the interviewer's suggestions (Henkel & Coffman, 2004). One possible explanation for why a person's memory can become altered so that they cannot distinguish between imagination and reality may be the cognitive process known as reconsolidation.

Reconsolidation

Since the late 1960s, researchers have shown that not all memories are stored verbatim (Chan & LaPaglia, 2013; Hupbach, Gomez, Hardt, & Nadel, 2007; Misanin et al., 1968, as cited by Nader & Hardt, 2009). Information that we attend to is stored (i.e., consolidated) for later use. When that information is later retrieved (i.e., reactivated), it is prone to alteration. One form of alteration can be by exposure to post-event misinformation. Reactivated memories become labile or easily altered when new information is introduced approximately 7-10 minutes after the original memory is reactivated (Walker, Brakefield, Hobson, & Stickgold, 2003). Recent research has provided evidence to support the evidence for reconsolidation by either changing existing memories (Chan & LaPaglia, 2013; Hupbach et al., 2007) or erasing them completely (Misanin et al., 1968, as cited by Nader & Hardt, 2009; Nader, Schafe, & LeDoux, 2000).

On a biological level, the consolidation and reactivation of memories is driven by protein synthesis in neurons (Nader et al., 2000). That is to say, protein synthesis occurs when new memories are formed, and then occurs again when that memory is later reactivated, in order to reconsolidate those memories. By blocking the formation of the new proteins, Nader et al. believed they could eliminate fear memories. In order to test how rats' memories could be disrupted, Nader et al. conducted an experiment in which they injected three separate groups of rats with the protein blocker anisomycin at different stages of learning. Each rat group was studied over the course of three days. The three groups were the: (1) Injection After Consolidation; (2) Injection Before Consolidation; and the (3) Injection During Reconsolidation.

On Day 1, all of the rats were classically conditioned to fear a tone (i.e., when a tone was played they were shocked; Nader et al., 2000). However, some of the rats in were also injected with anisomycin during learning, to prevent consolidation. On Day 2, the rats in half of the rats were not injected with anisomycin on the first day were immediately injected with anisomycin. The other half of the rats who were not injected on the first day first reactivated their learned fear response by hearing a tone and then being shocked, similar to Day 1. However, unlike Day 1, immediately after being shocked, the rats in this group were injected with the anisomycin, in order to disrupt reconsolidation. The rats who were injected with anisomycin on the first day were not tested on the second day. On Day 3, Nader et al. investigated how the rats would respond to the tone. The rats who were injected with anisomycin after they already consolidated their fear memories froze when they heard the shock, indicating that the rats remembered that they would be shocked after hearing the tone. On the other hand, the rats who were injected before consolidation could take place, did not freeze to the tone. Likewise, the rats who were injected after reactivating their memory did not freeze after hearing the tone. Nader et al.

reasoned that the rats who were injected during reconsolidation did not respond to the tone because the rats' attempts to reconsolidate their fear memories were disrupted by the protein blocker. Therefore, disruption during reconsolidation can erase, or at least alter, an original memory.

Nader et al. (2000) concluded that memories can be distorted, or in this case erased, by affecting the consolidation and reconsolidation processes. While later studies would show that psychopharmacological drugs such as *propranolol* could disrupt the reconsolidation of human memories (Brunet et al., 2008), researchers studying human memory reconsolidation shifted their attention to altering memories using behavioral techniques instead of drug interventions.

In order to test the effects of reconsolidation in humans, Hupbach et al. (2007) conducted a study with college students who were assigned to one of the three groups: Reminder Group, No Reminder Group, and Control Group. Hupbach et al.'s experiment also spanned a total of three days, with each group following the same procedure on Day 1 and Day 3, with the only difference between groups being on Day 2.

For all participants on Day 1, the experimenter pulled 20 object words (e.g., balloon, calculator, toy car) from a bag and had the participants read the words aloud before placing them in a blue basket (Hupbach et al., 2007). To ensure learning, the experimenter repeated the recall test until participants either recalled the words with 85% accuracy, or the participants completed the recall task four times (even if they failed to reach 85% recall accuracy). On Day 2, participants in the Reminder condition were shown the blue basket and asked by the same experimenter to recall the procedure from the previous day (but not the words themselves). These participants then learned a second, different set of object words. Participants in the No-Reminder group learned the same set of new words from a different experimenter, and were not

asked to recall the Day 1 procedure. A control group did not attend the second day. On the third day, participants in all three conditions were asked to recall the words from the Day 1.

Hupbach et al. (2007) found that participants in the No-Reminder group recalled approximately 46% of the words correctly while mistakenly recalling about 5% of the words from Day 2. Meanwhile, those in the Reminder group recalled only 36% of the words from Day 1, while recalling 24% of the words from Day 2. To explain these findings, Hupbach et al. argued that there must have been a disruption during the reconsolidation phase. Participants in the reminder group reactivated the fragile memories associated with Day 1, making those memories more susceptible to disruption from a new word list presented on Day 2.

Chan and LaPaglia (2013) extended the concept of the reconsolidation to episodic (i.e., event-based) memories. Across their experiments, Chan and LaPaglia had participants watch the pilot episode of the television series *24* which depicts a terrorist attack on a plane. They then completed a cued-recall task based on the video they watched. In this sense, the participants in the study were similar to eyewitnesses to a crime, as they recalled as much information as they could remember on the terrorist attack that occurred during the episode. Participants in the reconsolidation group were then asked to answer 24 questions, with 25 s to answer each question, as a way to reactivate the original memory. Those in the No Reminder control group did not answer these questions, as a way to prevent reactivation of the original memory. All participants then listened to an 8 min voice recording detailing the episode, though a third of the information given was incorrect. Then, 5 min later (or 24 hr in Experiment 6), participants completed a recognition test to see how much of the original information they retained. The results from the study indicated that the participants who reactivated the original memory were more likely to recall the misinformation compared to those who did not reactivate the original

memory. Their findings are just the first step in applying the reconsolidation research the study of eyewitness memory. However, researchers still need to investigate how reconsolidation may influence interrogations and false confessions.

Current Study

While the results of previous research may prevent us from accidentally convicting innocent suspects by forcing us to reevaluate eyewitness testimony, it would be preferable to prevent the innocent suspect from being wrongfully accused of a crime in the first place. By continuing to conduct research in the area we can achieve further understanding on the mechanisms that influence false confession rates. By doing so, we can apply that knowledge to the real world in an attempt to prevent individuals from falsely confessing, and reduce the number of people imprisoned for crimes they did not commit.

Given the existing literature on episodic memories and reconsolidation, it is possible that suspects internalize guilt during police interrogation because they are exposed to misinformation soon after reactivating their own memories. For example, the suspect might be asked to recount their actions on the night of a murder. Soon after, the interrogators may provide misinformation to them, during which time the reactivated memory is in a labile state. Therefore, the original memory may be easily altered, and, after reconsolidation, the suspect may come to remember the misinformation as fact.

To test this theory, the current study combined elements of Hupbach et al.'s (2007) reconsolidation paradigm and Russano et al.'s (2005) false confession paradigm. On Day 1, participants learned two word lists with a partner, and then recalled one list collaboratively and the other independently. On Day 2, the experimenter reactivated the Day 1 memories of some participants, but not others. Then, the experimenter accused all participants of having cheated

during the independent recall test and an interrogation ensued, which for some included minimization tactics and the offering of a deal. On Day 3, a confederate gauged whether the participant had internalized guilt. The current study thus employed a 2 (Reconsolidation vs. No Reconsolidation) x 2 (Deal + Minimization vs. No Deal + No Minimization) between-subjects design.

It was hypothesized that participants who were interrogated using minimization tactics and deals would be more likely to sign a confession statement than those who were interrogated with no tactics or deal (Russano et al., 2005). It is important to note that the effects of reconsolidation usually show after 24 hrs (Dudai, 2004). Therefore, we could not test the direct association between reconsolidation and compliance, as reconsolidation would not have occurred yet. As a result, we tested the association between the reactivation of one's memory with compliance.

Furthermore, we hypothesized that there would be no association between tactics and internalization as the use of the minimization technique is used to sidestep the resistance people might have to confessing, a form of compliance. Moreover, because internalization was measured 24 hrs after the reactivation of memory, the effects of the reconsolidation process on internalization was directly measured. It was hypothesized that participants who reactivated their memories on the second day, in which misleading post-event misinformation was presented during the reconsolidation window, would be more likely to internalize guilt, as defined by Kassin and Kiechel (1996) than those who did not reactivate their memories for the first day. Finally, it was predicted that an interaction would occur, in that participants who reactivated their memories for Day 1 and were interrogated with minimization and deals would be the most likely

to confess and internalize compared to those who do not undergo reconsolidation and were not interrogated using the latter interrogation tactics.

Chapter Two:

Method

Design

A 2 (Reconsolidation vs. No Reconsolidation) x 2 (Deal + Minimization vs. No Deal + No Minimization) between-subjects design was used in the current study. Participants were randomly assigned to one of four groups created by the 2 x 2 matrix. The two outcome variables (compliance and internalization) were binary and categorical in nature (i.e., either did or did not sign confession form and either did or did not internalize guilt).

Participants and Confederates

Eighty-six Towson University students participated in this study (72 women, 14 men; ages 18-26, $M_{\text{age}} = 18.68$, $SD = 1.42$). However, 22 students were removed from all analyses for not following directions (i.e., actually cheating during the independent recall phase) and another three were removed because they did not complete the study after Day 1 or 2. Therefore, the final sample consisted of 61 Towson University students (50 women, 11 men; ages 18-26, $M_{\text{age}} = 18.72$, $SD = 1.54$). All students received course credit for their Introduction to Psychology course for participating. Confederates included five female and one male undergraduate research assistants from the Towson University Memory Research Lab as well as one male graduate research assistant from the Towson University Gaming Lab.

Materials

Before the experiment began, each participant was asked to sign an informed consent form (see Appendix A). Study materials for Day 1 were taken from the first and second list of neutral words utilized by Hupbach et al. (2007; see Appendices B & C). The words were pulled out of a clear plastic container by the experimenter, read by the participants, and then placed into

a basket, as in Hupbach et al. (2007). On Day 2, participants completed a math distractor task composed of 40 addition problems (see Appendix D) between the reactivation of memory and the insertion of misinformation. All problems were simple addition problems (e.g., $134 + 235$) and it was not expected that participants would complete all the problems. In addition, the experimenter read from a prepared interrogation script (see Appendix E). On the final day, confederates read from a prepared script (see Appendix F) in order to test the internalization of guilt in participants. Furthermore, the participants were given a demographic questionnaire to complete (see Appendix G). The demographic questionnaire requested basic demographic information (e.g., age and gender) and a question which asked participants to explain what they liked and what they did not like about the experiment. The final question asked participants if they noticed anything unusual about any phase or task during the experiment, as a way to check if participants were able to determine the true purpose of the experiment. The experimenter then read the debriefing form (see Appendix H) to all participants at the conclusion of the study.

Procedure

The study was conducted over three consecutive days. Day 1 consisted of the word learning and recall. Day 2 involved the reactivation of memory and the memory reconsolidation manipulation as well as the interrogation and compliance check. Finally, on Day 3, we measured whether or not the participant internalized guilt for their crime.

Day 1: Memory task. On Day 1, the participant arrived at the lab and was asked to read and sign the informed consent form (see Appendix A). The experimenter then introduced the participant to the other participant (i.e., the confederate). Soon after, the experimenter began pulling a set of words out of a clear plastic container one-by-one (see Appendix B; Hupbach et al., 2007). The experimenter asked that the two individuals take turns reading each word aloud,

and to try to remember all the words, as their memory for the words will be tested later. After both the participant and the confederate read a word, the word was placed directly into the blue bucket. Immediately after all 20 items were read, the participants were given a blank sheet of paper and asked to recall as many words as possible in 5 min. The experimenter stressed that participants will not be able to move on to the next phase of the study until at least 15 out of the 20 words were recalled correctly, but that the two participants were allowed to work together to recall as many words as they could. The experimenter then stepped out of the room.

After 5 min elapsed, the experimenter returned to the room and checked to see if the participant and the confederate correctly recalled 15 words. If they did not, the participant and the confederate were asked to read each word again and were given another 5 min to try and recall 15 words. Once they managed to recall 15 words, or a maximum of four recall trials occurred (cf. Hupbach et al., 2007), the participants learned a second, 20 word list similar to the first (see Appendix C). The experimenter told the participants that the recall rules were the same except now they participant had to recall 15 words independently. This phase of the experiment, like the collaborative phase, was repeated until the participant correctly recalled at least 15 words or after four recall trials occurred. (cf. Hupbach et al., 2007).

Day 2: Reactivation manipulation. On Day 2, the participant returned to the lab around the same time as on Day 1. The experimenter told the participant that they would be working alone on Day 2 because the other “participant” was feeling ill and could not attend. Participants were randomly assigned to either the Reconsolidation or No Reconsolidation group. Those in the reconsolidation group were shown the blue basket and asked the participant to recall as much as they could about the procedure from the day before. The experimenter stressed to the participants that they were not to recall any of the words learned on the first day, only the procedure.

Participants in the No Reconsolidation condition were not asked to recall the procedure from Day 1. After reactivating their memories for Day 1 (Reconsolidation Condition) or immediately after arriving to the lab (No Reconsolidation Condition), the experimenter gave all the participants a distracter math task and gave them 10 min to complete as many math problems as possible (see Appendix D). The participants were given 10 min to complete the task because 10 min is approximately the minimum time needed before the reconsolidation window opens (Walker et al., 2003).

Day 2: Interrogation and tactic manipulation. After 10 min, the experimenter returned to the lab room and informed the participant that they must cancel the Day 2 session because tape recordings from the lab indicated that the participant had cheated during the independent recall task on Day 1. All participants were told that the primary investigator had been notified and would like a handwritten confession as an admission of guilt. The experimenter stressed that the primary investigator of the lab would attend the session on Day 3 to explain why the cheating was an issue. In addition, the experimenter told the participant that they would have to return next week for a 45-min “make-up” session as punishment for cheating. The experimenter then asked the participant to sign the confession up to three times. If the participant refused all three times, the experimenter marked the participant down as not compliant. The participant was then excused and asked to return the next day.

During this interrogation, participants assigned to the Deal + Minimization group were presented with minimization tactics (e.g., “You can admit you cheated, it’s just an experiment. This isn’t a test. I would have done the same to get out earlier”) as well as the offer of a deal (e.g., “If you confess, I will make sure to tell the primary investigator to reduce any punishments”) during their interrogations (see Appendix E). In contrast, participants in the No

Deal + Minimization group were not exposed to minimization or a deal during their interrogations.

Day 3: Internalization probe. On Day 3, a new confederate was waiting outside the lab. When the participant arrived, the experimenter told the participant that the lab was experiencing computer troubles, and that the participant would need to wait outside for 5 min while the experimenter corrected the issue. After the participant closed the door to the lab, the confederate initiated a conversation with the participant to check for internalization of guilt (see Appendix F). The confederate surreptitiously recorded this conversation on their cell phone. The principal investigator later read the transcripts to determine if the participant internalized guilt (e.g., “I didn’t do it intentionally, I mean I didn’t want to ruin anything”) or did not internalize guilt (e.g., “He said we cheated, but we didn’t”).

After 5 min, the experimenter returned and brought the participant into the lab. The participant was told that the professor in charge was running late and that they would complete a few tasks while waiting for her. The participant was first given 5 min to try and recall as many words as they could from Day 1, List 1 only. After that, they were given a brief demographic questionnaire that also probed for suspicion as to the true purpose of the study. Upon completion of the survey, the experimenter debriefed the participant on the true purpose of the study (see Appendix H). The experimenter stressed that all participants in the experiment were accused of cheating, even though they were all innocent. In addition, the experimenter mentioned that the head researcher was not notified, that their confession was used for analysis purposes only, and that they did not have to return next week. The participants were also given contact information

for the counseling center and the primary investigator as a precaution. If the participant failed to return between Days 2 and Day 3, the primary investigator debriefed them via e-mail.¹

¹ Out of 86 participants, only two did not return on Day 3 after being interrogated on Day 2

Chapter Three:

Results

Chi-square tests of independence were used to analyze the data for all 61 participants² because the dependent measures (compliance and internalization) were categorical in nature. Compliance was defined as whether or not the participant signed the confession statement. Similarly, the transcript of the conversation between the confederate and participant on Day 3 was checked to see if participants internalized guilt for cheating on Day 1. If the chi-square analysis was significant, a binary logistic regression was used to determine odds ratios and replicability of the results through bootstrapping techniques.

A 2 x 2 chi-square test of independence was performed to determine the relationship between reactivation of memories and compliance rates. Results indicated that the association was not significant, $\chi^2(1, N = 61) = 1.50, p = .221, \phi_c = .16$ (see Table 1). Only three additional participants who reactivated their memories for the first day complied ($n = 26, 86.67\%$) compared to those who did not reactivate their memories ($n = 23, 74.19\%$).

Table 1
Crosstabulation of Reactivation and Compliance

Reactivation	Compliance		Total	χ^2	Φ_c
	Yes	No			
Yes	26 (24.1)	4 (5.9)	30	1.50	.16
No	23 (24.9)	8 (6.1)	31		
Total	49	12			

Note. Expected scores appear in parentheses below observed scores.

² It should be noted that the first 20 participants had a slightly different procedure than the final 41, in that they were not told that they would face any consequences for cheating. However, a 2 x 2 chi-square test of independence showed no difference in compliance or internalization rates for participants in Procedure 1 or Procedure 2. Therefore, all data was collapsed and ran as one set.

Fisher's Exact test indicated that there was also no relationship between reactivation of memories and internalization rates, $p = 1.00$, $\phi_c = .05$ (see Table 2)³. Ten percent of participants ($n = 3$) who reactivated their memories internalized guilt, whereas 12.90% ($n = 4$) who did not reactivate their memories did. It should be noted that only 11% of all participants internalized guilt.

Table 2
Crosstabulation of Reactivation and Internalization

Reactivation	Internalization		Total
	Yes	No	
Yes	3 (3.4)	27 (26.6)	30
No	4 (3.6)	27 (27.4)	31
Total	7	54	

Note. Expected scores appear in parentheses below observed scores.

An additional chi-square test revealed a significant relationship between tactics and compliance rates, $\chi^2 (1, N = 61) = 6.79$, $p = .008$, $\phi_c = .34$ (see Table 3). That is, when the experimenter used interrogation tactics during the interrogation, participants were more likely to sign the confession form ($n = 29$, 93.50%) than the participants that did not experience the common interrogation tactics ($n = 20$, 66.67%).

³ Fisher's exact test was used in place of a chi-square analysis in instances in which at least one cell in the contingency table yielded an expectant frequency score of less than 5.

Table 3
Crosstabulation of Tactics and Compliance

Tactics	Compliance		Total	χ^2	Φ_c
	Yes	No			
Present	29 (24.9)	2 (6.1)	31	6.97*	.34
Absent	20 (24.1)	10 (5.9)	30		
Total	49	12			

Note. * $p < .05$. Expected scores appear in parentheses below observed scores.

Because there was a significant relationship between tactics and compliance rates, a binary logistic regression was used to estimate odds ratios and replicability. Results indicated that the model was significant, $\chi^2(1) = 6.09$, $p < .05$, and that it accounted for approximately 10% of the variance, Cox & Snell $R^2 = .10$. The Exp (β) coefficient indicated an odds ratio of 2.50 for Tactic. Bootstrapping was used to validate these results. Across 1,000 samples, whether or not tactics were used was shown to be a reliable predictor of compliance rates, 95% CI [0.22, 10.35].

Fisher's Exact test also revealed a significant relationship between tactics and internalization rates, $p = .011$ (see Table 4). When the experimenter used interrogation tactics during the interrogation, participants were more likely to internalize guilt ($n = 7$, 22.60%) than the participants that did not experience the interrogation tactics ($n = 0$, 0.00%).

Table 4
Crosstabulation of Tactics and Internalization

Tactics	Internalization		Total
	Yes	No	
Present	7 (3.6)	24 (27.4)	31
Absent	0 (3.4)	30 (26.6)	30
Total	7	54	

Note. * $p < .05$. Expected scores appear in parentheses below observed scores.

Because there was a significant relationship between tactics and internalization rates, a binary logistic regression was conducted in order to determine odds ratios and replicability. Results from the logistic regression revealed that our model was significant, $\chi^2(1) = 10.36, p < .05$, and that it accounted for approximately 16% of the variance, Cox & Snell $R^2 = .16$. The Exp (β) indicates an odds ratio of 21,706.68 for Tactic.⁴ Bootstrapping was used to validate these results. Across 1,000 samples, whether or not tactics were used was shown to be a reliable predictor of internalization rates, 95% CI [9.38, 10.35].

In two analyses, the relationship between compliance and reactivation were tested separately for the Tactics Present condition and the Tactics Absent condition (see Figure 1). Fisher's Exact test indicated that participants who experienced tactics ($n = 31$) and reactivated their memories ($n = 14$: 93.33%) were no more likely to comply than participants who experienced tactics but did not reactivate their memories ($n = 15$: 93.75%), $p = 1.00$. For participants who received no tactics ($n = 30$, see Figure 1), a chi-square analysis revealed that participants who did not experience tactics but reactivated their memories ($n = 12$: 80.00%) were

⁴ It should be noted that all 7 participants who internalized in this study were in the Tactics Present condition, and therefore 0 participants in the Tactics Absent condition internalized guilt. This may explain why the odds-ratio is so high.

no more likely to comply than participants who did not experience tactics nor reactivate their memories ($n = 8$: 53.33%), $\chi^2(1, N = 30) = 2.40, p = .121, \phi_c = .28$

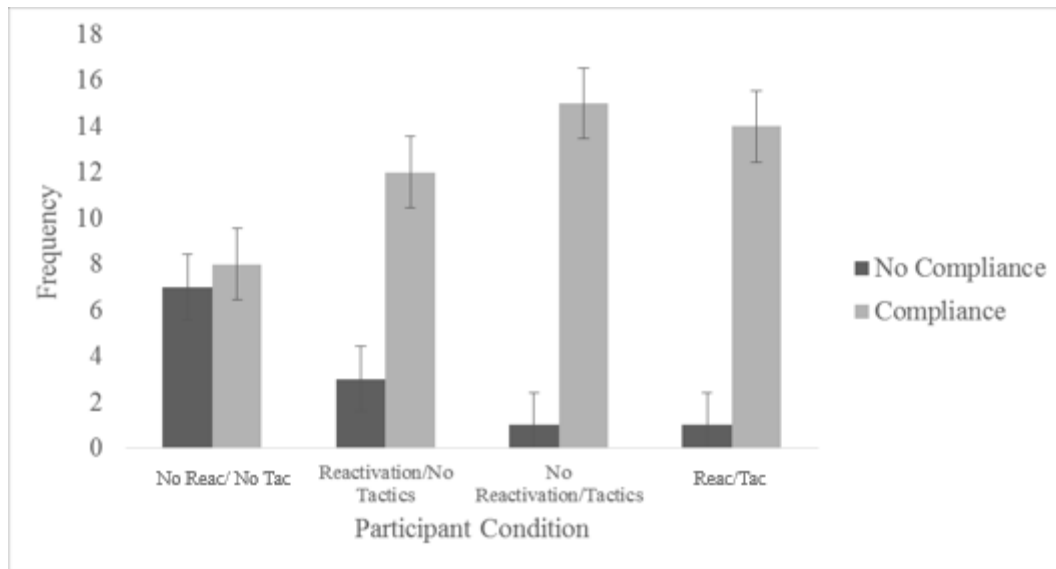


Figure 1. Frequency of No Compliance and Compliance for each experimental condition. Error bars represent standard errors.

Two additional analyses tested the relationship between internalization and reactivation for the Tactics Present and Tactics Absent conditions (see Figure 2). Fisher's Exact test indicated that participants who experienced tactics ($n = 31$) and reactivated their memories ($n = 3$: 20.00%) were not more likely to internalize than participants who experienced tactics but did not reactivate their memories ($n = 4$: 25.00%), $p = 1.00$. For participants who received no tactics ($n = 30$, see Figure 2), no statistical comparisons could be made because no participants internalized guilt if there was an absence of tactics during the interrogation.

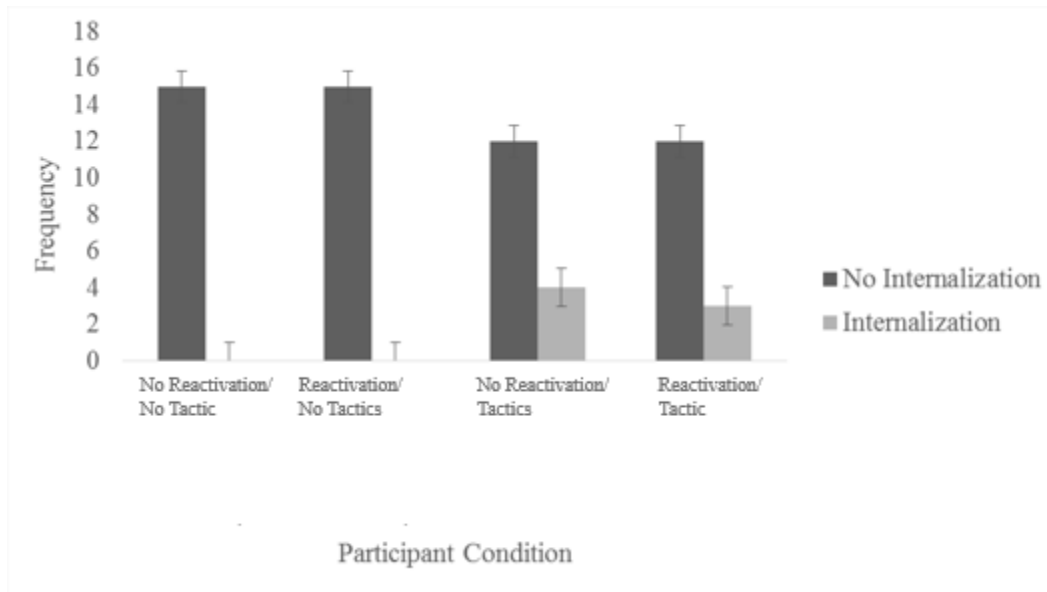


Figure 2. Frequency of No Internalization and Internalization for each experimental conditions. Error bars represent standard error.

Chapter Four:

Discussion

Consistent with previous research (Klaver et al., 2008; Russano et al., 2005), individuals in the current study were more likely to falsely confess when exposed to tactics including both the minimization technique and use of deals. Furthermore, when the experimenter used interrogation tactics during Day 2 of testing, participants were more likely to internalize guilt. In fact, they were the only participants in the experiment to internalize guilt, a result that was unexpected. However, contrary to the hypothesis, the reactivation of memories for Day 1 did not increase the likelihood that individuals would internalize guilt and falsely remember having cheated. Moreover, results indicated that there was no relationship between compliance and reactivation after separating the Tactics Present and Tactics Absent conditions. In addition, there was no relationship between internalization and reactivation after separating the Tactics Present and Tactics Absent conditions.

The current results indicated that the use of tactics did affect whether or not someone internalized guilt for cheating. The fact that participants who experienced the use of these tactics internalized guilt more than those who did not may be explained by the participants' physiological arousal. Memory research has shown that, when someone is in a state of low arousal, they are more likely to recall false information than those who are in a state of high arousal because those with low arousal are less likely to focus on central information, thus increasing effects of misinformation and suggestibility (Van Damme & Smets, 2014). One goal of the minimization technique is to rationalize the crime for the suspect. In the current study, the experimenter told participants that their cheating in the experiment was not a major act when compared to a more serious offense such as cheating on an exam. Perhaps the minimization of

the situation allowed the participants to relax, thus lowering their arousal, because they were told that what they did was not detrimental to their well-being. Meanwhile, participants who did not experience minimization would continue to believe that their action would negatively impact their academic status at the university, and so their arousal may have been high during the internalization check. If this was the case, then participants who experienced minimization were most likely to internalize guilt because they were more susceptible to the misinformation due in part to their low arousal. Future studies should directly investigate the effects of minimization on a person's physiological arousal as related to compliance and internalization.

The lack of an association between reactivation and compliance was unsurprising. The time between the introduction of the misinformation and the signing of the confession form was about 5-10 min, which is not enough time for memory to reconsolidate (Dudai, 2004). Thus, it was expected that participants who reactivated their memories would have similar compliance rates to those who did not reactivate their memories.

The hypothesis that participants who reactivated their memories would be more likely to internalize guilt was not supported by the data. One possible explanation for these findings is that very few participants internalized guilt. In fact, only seven (11%) of the participants internalized guilt. This number is smaller than those seen in other studies investigating internalization including Kassin and Kiechel (1996: 28%) and Horselenberg et al. (2003: 42%). However, each of these studies used the original computer crash paradigm whereas the current study adapted Russano et al.'s (2005) cheating paradigm. Perhaps the alleged 'crime' for which participants were accused in the computer crash paradigm is more plausible than the one seen in the cheating paradigm. That is, participants might find it more believable that they may have accidentally pressed a computer key than deliberately discussed answers with someone on a memory task.

Klaver et al. (2008) conducted a study utilizing Kassin and Kiechel's computer crash paradigm. However, Klaver et al. introduced a low plausibility group, in which the participants were told hitting the ESC key instead of the ALT key would cause the computer to crash. The participants were then accused of causing the computer to crash by hitting the ESC key, an action seen as having low plausibility since the ESC key is far away from typically used letters on a keyboard. None of the participants in Klaver et al.'s low plausibility group internalized. Like Kassin and Kiechel's procedure (1996), Klaver et al.'s study still involved an accidental action.

Alternatively, perhaps internalization would be less likely when the action is something that is intentional rather than accidental. If our accusation that the participant intentionally cheated by discussing answers was seen as implausible by the participant, it could explain why so few participants internalized guilt.

Another explanation as to why memory reactivation failed to increase internalization may be related to memory distinctiveness. The distinctiveness heuristic states that individuals expect to have distinct, detailed recollections for events that actually occurred (Schacter, Israel, & Racine, 1999). If the individual cannot recall distinctive details regarding a memory, then they may reject that memory and believe that it had not occurred. It could be argued that the post-event misinformation (i.e., the accusation of cheating) provided to participants may not have had enough distinct details associated with it to be considered as a 'true' memory. Thus, they may have been able to make the determination that cheating did not occur and therefore they did not internalize guilt and falsely remember having cheated. Considering plausibility as a possible moderating factor, if the event was more plausible then details for the event of cheating may have been made more distinctive and therefore falsely recalled. If that were the case, then one

could argue that together, the increase in plausibility and recollection of distinct details for the event of cheating could increase acceptance of the misinformation and internalization of guilt.

Limitations and Future Directions

Similar to the results regarding reactivation and compliance, it was expected that individuals who received interrogation tactics would comply with the experimenter and sign the confession more often than those who did not. Prior research has shown that the use of techniques such as minimization and the offering of deals significantly increases the likelihood that participants would sign a false confession form (Klaver et al., 2008; Russano et al., 2005). However, the current research study combined both minimization and the use of deals to create the tactics condition. Previous researchers have tested the effects of the aforementioned interrogation tactics separately (Russano et al., 2005). Because we tested both tactics together, we cannot be certain which tactic, if either, had more of an effect on compliance and internalization rates. Therefore, future studies would benefit from testing these two tactics separately to see if tactics differentially affect compliance and internalization.

The current study sample consisted of mostly female participants ($n = 50$: 82%) and the experimenter during the study was always male. In order to determine how gender may have played a role in our results, all analyses conducted on the data involving all participants were conducted again, but only with the data from female participants. When testing only women, the patterns of results for the relationships between reactivation and tactics on compliance and internalization were similar to those reported in the entire sample. These results were similar to those found in other confession studies (Horselenberg et al., 2003; Kassin & Kiechel, 1996; Klaver et al., 2008). However, the lack of a diverse sample in regards to gender is concerning. Previous research on social influence has shown that women react differently during certain

social situations than men (Eagly, 1983). For example, it was believed that women were more likely to be influenced by someone than a man, and that men were more influential. However, other studies designed to investigate social influence and negative behaviors (i.e., those that can be seen as incriminating to the participant) have refuted these claims (Blass, 1999; Burger, 2009). Burger (2009) reasoned that the power of the situation can override certain individual characteristics that could affect compliance under social influence. Future studies should seek to recruit a more diverse sample in order to investigate potential gender differences between participants in their interactions with interviewers in regards to the use of tactics such as minimization and deals and compliance rates.

In addition to creating a female dominated sample, our small sample size made it difficult to test for interaction effects. Unfortunately, because more than 20% of the cells created in our contingency tables for both compliance and internalization had expected frequency scores below five, a three-way loglinear analysis could not be computed in order to test for interaction effects (Tabachnick & Fidell, 2007). As a result, future studies should aim to recruit larger samples in order to test for the interaction effects of reactivation and tactics on compliance and internalization of guilt.

Conclusions

The results from the study can be applied to the criminal justice system. The findings that the use of the minimization technique and deals continues to increase the likelihood that an innocent person will confess to crimes they did not commit indicates that interrogators need to be cautious when employing such techniques, especially since the use of these tactics increased the likelihood that an individual internalized guilt for cheating. If these tactics reduce a suspect's state of arousal and increases the chances that the suspect will accept false information as having

actually occurred, then these tactics can be a main cause of false confessions. No participants internalized guilt unless interrogation tactics were used. If this finding should replicate in future studies, then it would be wise for the criminal justice system to consider banning the use of the minimization technique during interrogations and to adopt a new method that would increase the accuracy of confessions and reduce the likelihood of false confessions.

In summary, the results from the current study revealed that the use of tactics during interrogations increased the likelihood that a person will confess to cheating. Likewise, the use of the same methods also increased the chances that a person would internalize guilt for cheating. These results provide interesting implications regarding the criminal justice system and how interrogations are conducted in the United States. Future research should investigate a more diverse sample in regards to gender as well as how other tactics used during interrogations (e.g., maximization) may affect internalization rates. In addition, research in to the effects of a delay on interrogation should be conducted to determine if a delay from when a person completes a task and the accusation of cheating may influence internalization rates. Finally, research regarding reconsolidation and internalization should seek to see if an increase in the plausibility and memory distinctiveness of an accused event would moderate the effect that reconsolidation may have on internalization of guilt.

APPENDICES

Appendix A

Informed Consent Form

INFORMED CONSENT FORM

PRINCIPAL INVESTIGATOR: Christopher Normile PHONE: (267) 371-3009

EMAIL: cnormi1@students.towson.edu

Purpose of the Study:

This study aims to test the idea that people continually forget information as time elapses. More specifically, the purpose of this study is to examine several psychological concepts in the context of memory and how it changes over time.

Although students may not directly benefit from participation in this study, results from this study will allow researchers to better understand how memory degrades over time, and can lead to steps being taken to help people improve their memory abilities.

Please note that you must be 18 years old or older to participate in this study. Students who successfully complete the study will be rewarded with 3 research pool credits at the end of the experiment.

Procedure:

Participants will learn a random list of 20 object words with a partner. After all 20 words have been read, participants will complete a recall test with the aid of their partner. Participants will be expected to recall at least 15 words, to prove sufficient learning, before the experiment can continue. After at least 15 words have been learned, participants will learn another 20 words at the same time as their partner. However, during this phase of the study participants are to complete the recall test independently. As with the first word list, participants will be expected to recall at least 15 words before continuing. Day 1 should take about 30 minutes to complete

One day later, you will return to the lab for the second phase of the study. You will be asked to once again recall as many of the original words from Day 1 as possible. You will only complete the recall task once. Day 2 should take about 25-30 minutes to complete. You will then return one final time one day later.

On the final phase of the study you will be asked to once again recall as many words as possible from Day 1. As with Day 2, you will only complete the recall task once. Day 3 should take about 25-30 minutes to complete.

Risks/Discomfort:

There are minimal risks involved with participating in this study. It is possible that participants may become distressed or irritated while completing the memory recall tasks. Should you become distressed, remember that you may withdraw or discontinue your participation in this study at any time.

If you become distressed as a result of participating in this study, we recommend that you contact the Towson University Counseling Center at (410) 704-2512.

Voluntary Participation:

Your participation in this study is voluntary, and you may withdraw participation at any time. At any time you may refrain from answering any questions or completing any tasks. You will not be penalized, meaning your standing in your classes will not be affected, if you choose to discontinue or withdraw your participation from this study. Should you withdraw your participation, any and all data you have contributed will remain confidential.

Confidentiality:

All information you provide during this study will be kept confidential. Any and all data you provide can only be identified through identification numbers, which are randomly assigned and thus cannot be traced back to you. Your name will never be associated with the data you have provided.

If you understand everything in this document, and agree to participate in this study, please *INITIAL* the statements and sign your name below.

_____ I am at least 18 years of age.

_____ I understand all data will be kept confidential.

_____ I understand that I may be video recorded during the experiment, and that all recordings will be kept confidential.

_____ I have read the information on this form and I understand it.

_____ All questions have been answered to my satisfaction and understanding.

Participant Signature

Date

Witness to Consent Procedures

Date

Please be aware that the Institutional Review Board for the Protection of Human Participants at Towson University has approved this study. If you have any questions concerning this study, please contact Dr. Kerri Goodwin, at (410) 704-3202 or at kgoodwin@towson.edu. Questions may also be directed to the Towson University Institutional Review Board Chairperson, Dr. Debi Gartland, at the Office of University Research Services, 8000 York Road, Towson University, Towson, Maryland 21252; Dr. Debi Gartland can also be reached by phone at (410) 704-2236.

Appendix B

Day 1 Word List (Cooperative)

Hupbach, Gomez, Hardt, & Nadel (2007)

1. Balloon
2. Bow
3. Calculator
4. Car
5. Crayon
6. Cup
7. Dice
8. Feather
9. Flashlight
10. Flower
11. Glue
12. Key
13. Sock
14. Sponge
15. Spoon
16. Sunglasses
17. Teabag
18. Tennis
19. Toothbrush
20. Whistle

Appendix C

Day 1 Word List (Independent)

Hupbach, Gomez, Hardt, & Nadel (2007)

1. Apple
2. Band-Aid
3. Battery
4. Book
5. Cassette Tape
6. Cellular Phone
7. Comb
8. Dollar
9. Elephant
10. Envelope
11. Paper Clip
12. Toy
13. Puzzle
14. Rock
15. Straw
16. Thread
17. Tissue
18. Watch
19. Shovel
20. Zipper

Appendix D

Distractor Math Task

1. $167 + 109 =$ 2. $996 + 643 =$ 3. $864 + 745 =$ 4. $213 + 321 =$ 5. $435 + 989 =$

6. $719 + 912 =$ 7. $432 + 899 =$ 8. $333 + 999 =$ 9. $888 + 541 =$ 10. $867 + 238 =$

11. $605 + 723 =$ 12. $549 + 982 =$ 13. $869 + 110 =$ 14. $103 + 899 =$ 15. $723 + 732 =$

16. $275 + 334 =$ 17. $769 + 909 =$ 18. $287 + 678 =$ 19. $659 + 807 =$ 20. $398 + 845 =$

21. $757 + 117 =$ 22. $349 + 780 =$ 23. $769 + 358 =$ 24. $199 + 239 =$ 25. $134 + 235 =$

26. $638 + 791 =$ 27. $839 + 650 =$ 28. $888 + 666 =$ 29. $652 + 890 =$ 30. $542 + 986 =$

31. $690 + 563 =$ 32. $639 + 762 =$ 33. $387 + 733 =$ 34. $659 + 329 =$ 35. $777 + 369 =$

36. $630 + 307 =$ 37. $687 + 860 =$ 38. $607 + 897 =$ 39. $239 + 836 =$ 40. $302 + 198 =$

Appendix E

Interrogation Script

Experimenter: Hello. Now I know you're ready to start the next phase of the experiment, but unfortunately we won't be able to do so. You see, after reviewing the tape from yesterday recorded by the camera in this room (*experimenter points to camera*), it has come to my attention that you and your partner yesterday gave each other answers in order to complete the study faster. This of course interferes with our procedure and may affect our hypothesis, as you guys did not complete the task as directed. Overall this means that the data you gave us may no longer be useful. Now in regards to "punishment," in order to make up for your unusable data, we are going to need you to come back sometime next week for another 30 minutes. You will not receive any extra research pool credit for this participation, think of it as a make-up that allows you to receive the original three credits. You'll also still have to come back tomorrow during your scheduled time as we'll have another task for you to complete, and Dr. Goodwin (the principal investigator) will be here to further explain why the cheating is a problem and why we'll need you to come back for one more session next week. That way if you have any questions, you can ask her directly. So what I need from you today is for you to sign this form I'm going to write up, saying that you and your partner cheated yesterday and that you acknowledge that you did so. This will be kept and seen by only me and the head researcher. I only need it in case anyone asks why I threw away data. Your cooperation in this matter would be greatly appreciated.

Note: The following will **only occur** if the participant is assigned to the **Deal + Minimization group**

Experimenter: Just note that this really is not that big a deal. I mean, it's not like you cheated on an exam or anything. Heck, if I were you I might have done the same thing just to get the experiment over with. But in the end, it does throw off the experiment so I'll still need you to sign the form. I'll tell you what, if you sign this form I'll let the head researcher know how cooperative you were and she might even give you a fast, simple make up task. Wouldn't that be useful?

***The experimenter will continue to ask the participant to sign the form until one of two things occurs: (1) the participant signs or (2) the participant refuses all three times. Should the participant refuse all three times, the experimenter will stop requesting a signature and continue with the experiment.

Appendix F

Day 3 Confederate Script

Upon participant arrival to the lab, a confederate will be waiting outside of the lab rooms. The experimenter will then open the door and speak with the participant.

Experimenter: I don't quite have everything ready yet, just give me a couple of minutes please. Sorry for the wait!

The experimenter will then shut the door and walk away. The confederate will have her phone out and will pretend she is texting someone else. She will then speak with the participant

Confederate: Hi, how are you? Waiting to be in an experiment too huh? I hate that we have to do these things, but it's better than writing a paper. Is that guy who spoke to you before your experimenter? He was outside earlier talking to someone and he seemed really upset and a little frustrated, do you have any idea why?

If the participant says they do not know why, the confederate will continue speaking

Confederate: Oh so you're not sure? I think it has to be about a person, but I'm not sure who. Any ideas?

The confederate will then type into her phone the word for word response given by the participant. After about 7 minutes of talking, the experimenter will then open the door and allow the participant into the lab, where the experiment will continue.

Appendix G

Demographic Survey

- 1) Please indicate your age, in years: _____
- 2) Please indicate your participant number: _____
- 3) Please circle your gender:

MALE

FEMALE

- 4) Please mark an X next to your race/ethnicity:

 American Indian or Alaska Native Asian Black or African American Native Hawaiian or Other Pacific Islander. White Other: _____ Prefer not to answer

- 5) What did you like about this study?

- 6) What did you NOT like about this study?

- 7) Did you notice anything strange about the study as a whole (e.g., word list, math task, etc.)?

Appendix H

Debriefing Form

The true purpose of the current study is to examine the effects reconsolidation and interrogation tactics on the likelihood that participants will sign a false confession form and internalize guilt for “cheating”. According to memory research, information that we paid attention to is stored for later use. When a memory is later remembered it is believed that the retrieved memory is prone to disruption or alteration. One form of disruption or alteration can be post-event misinformation (i.e., incorrect information given at a time following the original event). For example, you might remember catching a fish that was 30 inches long. A friend may mention two days later that it was actually 40 inches long. From then on you tell all your friends that the fish was 40 inches, when in fact it was only 30 inches. It is currently believed by many memory researchers that remembered memories become easily altered when new information is introduced approximately 7-10 minutes after the original memory is recalled. This phenomenon is known as *memory reconsolidation*.

In the criminal justice system, confessions are one of the most crucial pieces of evidence that can be provided to the courts. Yet it has been shown time and time again that people are willing to confess to a crime they did not commit; in fact, 30 % of wrongfully convicted criminals have admitted to confessing to a crime they did not commit. Various studies have been conducted that show how easy it is to get people to admit to a “crime” they did not commit and to sign a confession. What is more perplexing is not only do some of these people admit to committing a crime, they internalize what they did and actually begin to believe that they may have committed the crime when they had not (some even create false memories). What is even scarier is that juries have a hard time believing that someone would lie about committing a crime, so false confessions can be enough to convict you, even if you did not commit the crime!

In the current study we wanted to compare the number of false confessions we received after participants underwent reconsolidation compared to those who did not undergo reconsolidation. We hypothesize that those who are in the reconsolidation group, who on Day 2 will be asked to remember what they did on Day 1 before completing any more tasks, will be more likely to falsely confess than those in the no reconsolidation group, because the effects of reconsolidation should cause the new false information (i.e., asking for help on the individual

recall task) will overwrite the original memory of completing the individual word recall task. We were unable to disclose such information regarding the hypotheses and the true purpose of the current study to participants before the debriefing because we wanted to eliminate the possibility of participant biases. Please note that you did **NOT** do anything wrong during the study and that you will **NOT** have to return next week for a “make-up” study. After today you will receive all 3 credits you are entitled to for participating in this study the last three days.

Although you will not receive your individual results or scores, each participant is allowed to request a copy of the general results of the study once the entire study has been completed. We ask that you please do not reveal any information about this study to others in a way that could affect its results or final outcome. Please do not tell potential participants what this study is about or any of the information on this debriefing form.

We also recommend that you contact the Dr. Kerri Goodwin (faculty advisor, 410-704-3202) and/or the Towson University Counseling Center, at (410) 704-2512, if you have become distressed as a result of participating in this study. If you have any other questions, or if you wish to obtain the study’s results upon its completion, feel free to contact the primary investigator Christopher Normile at (267)371-3009 or cnormi1@students.towson.edu. Thank you for your participation.

Appendix I: IRB Approval

**APPROVAL NUMBER: 15-A011**

To: Christopher Normile
 8000 York Road
 Towson MD 21252

From: Institutional Review Board for the Protection of Human
 Subjects Elizabeth Katz, Member (5)

Date: Monday, September 15, 2014

RE: Application for Approval of Research Involving the Use of
 Human Participants

Office of Sponsored Programs
 & Research

Towson University
 8000 York Road
 Towson, MD 21252-0001

t. 410 704-2236
 f. 410 704-4494
www.towson.edu/ospr

Thank you for submitting an Application for Approval of Research Involving the Use of Human Participants to the Institutional Review Board for the Protection of Human Participants (IRB) at Towson University. The IRB hereby approves your proposal titled:

Planting the Seeds of Doubt: How Reconsolidation and Interrogation Tactics Influence Coerced-Internalized False Confessions

If you should encounter any new risks, reactions, or injuries while conducting your research, please notify the IRB. Should your research extend beyond one year in duration, or should there be substantive changes in your research protocol, you will need to submit another application for approval at that time.

We wish you every success in your research project. If you have any questions, please call me at (410) 704-2236.

CC: Kerri Goodwin
 File

Appendix I: IRB Approval cont.



Date: Monday, September 15, 2014

NOTICE OF APPROVAL

TO: Christopher Normile **DEPT:** PSYC

PROJECT TITLE: *Planting the Seeds of Doubt: How Reconsolidation and Interrogation Tactics Influence Coerced-Internalized False Confessions*

SPONSORING AGENCY: None

APPROVAL NUMBER: 15-A011

The Institutional Review Board for the Protection of Human Participants has approved the project described above. Approval was based on the descriptive material and procedures you submitted for review. Should any changes be made in your procedures, or if you should encounter any new risks, reactions, injuries, or deaths of persons as participants, you must notify the Board.

A consent form: is is not required of each participant

Assent: is is not required of each participant

This protocol was first approved on: 15-Sep-2014

This research will be reviewed every year from the date of first approval.


Elizabeth Katz, Member
Towson University Institutional Review Board

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human memory consolidation and reconsolidation. *Nature*, 425, 616-620. doi:

10.1038/nature01930

Christopher J. Normile

Education

- May 2015 (Expected) **M.A., Experimental Psychology**, Towson University
 Current GPA: 4.00
 Thesis: *Planting the seeds of doubt: How memory reactivation and tactics influence internalized false confessions*
 Committee: Dr. Kerri Goodwin, Dr. Justin Buckingham, Dr. Jeff Kukucka
- May 2013 **B.A., Psychology**, *magna cum laude*, Bloomsburg University
 Overall GPA: 3.82
 Minor: Criminal Justice
 Undergraduate Thesis: *Facial feedback: Buffering against social rejection*
 Advisor: Dr. Jennifer Johnson

Academic Honors

- 2014 Omicron Delta Kappa National Leadership Society
 2012 Psi Chi, The International Honors Society in Psychology, Vice President
 Phi Kappa Phi National Honors Society
 2009-13 Dean's List, Bloomsburg University

Research Interests

Cognitive influences on jury decision-making, interrogation, and eyewitness memory; false memory & internalized false confessions; collaborative inhibition in jury deliberations; effects of reconsolidation on jury decision-making

Research Experience

- Current Towson University Psychology Department, Goodwin Lab, *Research Assistant*
- 2012-13 Bloomsburg University Psychology Department, Johnson Lab, *Research Assistant*

Conferences

Goodwin, K. A., Normile, C. J., & Boone, S.A. (2015). *Collaborative inhibition in juror memory and decision-making*. Paper presented at the biennial conference for the Society for Applied Research in Memory and Cognition (SARMAC XI), Victoria, BC, Canada, June 24-27, 2015.

Normile, C. J., Goodwin, K. A., & Kukucka, J. (2015). *Planting the seeds of doubt: Effects of reconsolidation and tactics on internalized false confessions*. Poster presented at the

annual conference of the Association for Psychological Science (APS), New York, NY, May 21-24, 2015.

Normile, C. J., Johnson, J. A., & Dandeneau, S. D. (2013). *A facial feedback training task to buffer against social rejection*. Poster presented at the annual meeting of the Eastern Psychological Association, New York, NY, March 1-3, 2013.

Manuscripts

Krauss, A. R., **Normile, C. J.,** Kirby, S. L., & Smith, P.A. (MS in prep). *Measuring the effect of stuttering advertisement on listener information retention*.

Normile, C. J., Rothweiler, J., Johnson, J. A., & Dandeneau, S. D. (MS in prep). *Buffering the effects of ostracism on the attentional networks using facial feedback training*.

Grants & Awards

2014	Graduate Teaching Assistantship, Towson University (\$4,000)
2013	Graduate Teaching Assistantship, Towson University (\$4,000) Distinguished Student in Psychology Award, Bloomsburg University Travel Grant, Bloomsburg University (\$425)
2012	Undergraduate Research, Scholarship, and Creative Activities Award (\$4,500)

Teaching Interests

Intro to Psychology; Experimental Psychology; Cognitive Psychology; Introductory Statistics; Advanced Statistics; Memory; Psychology and Law

Teaching Experience

2015	Teaching Assistant, Behavioral Statistics, Towson University (Psyc 212)
2014	Teaching Assistant, Behavioral Statistics, Towson University (Psyc 212) Teaching Assistant, Research Methods, Towson University (Psyc 314)
2013	Teaching Assistant, Cognitive Psychology, Towson University (Psyc 461) Teaching Assistant, Behavioral Statistics, Towson University (Psyc 212) Teaching Assistant, General Psychology, Bloomsburg University (Psych 101)
2012	Teaching Assistant, General Psychology, Bloomsburg University (Psych 101)

Membership in Professional Organizations

2014-Present	Society for Applied Research in Memory and Cognition Association for Psychological Science American Statistical Association
2012-2014	Eastern Psychological Association

