

**Support for Reverse Developmental Trends: A Possible Correlation Between
False Memory Errors**

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Abstract

Children in the 3rd and 4th grades (N = 53) were given two memory tasks. The first task asked participants to witness a crime and choose the assailant from a photo lineup. However, the lineup contained only a familiar bystander and four foils. The second task asked participants to view three lists of words and recall as many words from those lists as possible. Participants' performance was analyzed across both tasks. Results showed that children who chose the bystander in the lineup also had a higher rate of false memory errors on the word recall and recognition tasks than children who chose another individual from the lineup or stated the assailant was not in the lineup. However, the highest rate of false memory errors was exhibited by children who chose any one of the foils or reported that they did not know if the assailant was in the lineup. Theoretical explanations for these findings are discussed.

Support for Reverse Developmental Trends: A Possible Correlation Between False Memory Errors

False memory research has become an increasingly important area of interest in our legal system. The testimonies of eyewitnesses are often a great influence on the decisions of juries and sadly enough, are the cause of many wrongful convictions each year (Gross, Jacoby, Matheson, Montgomery, & Patel, 2004). An increase in the number of child witnesses opened the eyes of researchers to the implications for false memory research in our legal systems. Researchers want to know the accuracy of both children's and adults' testimony. Should there be an age criterion for children's testimonies? Can we trust a child's testimony? Should the testimony of children be allowed at all? These are questions that false memory research may help answer.

False memories refer to "a wide range of phenomena that have been observed in the laboratory, in psychotherapeutic settings, and in other areas of real life" (Reyna & Lloyd, 1997, p. 95). However, for this study, it is important to recognize two types of false memory. Some false memories occur almost mechanically in the mind from situations involving basic comprehension of new information. "[People] say that they remember being told that 'the bird is under the table' although they were actually told that 'the bird is in the cage' and 'the cage is under the table'" (Reyna & Lloyd, 1997, p. 96). Based on the other two statements, the sentence that "the bird is under the table" is true. Nevertheless, there is a qualitative difference between remembering an exact sentence as you heard it and reporting inferred information, however true it may be. Differences like this are crucial in courtroom testimony. The other type of false

memory is comprised of errors that are produced by outside stimuli. Such stimuli may be both unintentional and intentional (e.g. laboratory experiments) and cause false memories to be implanted so that people believe that they have experienced an event that was merely suggested to them (Reyna & Lloyd, 1997). By studying such variances in false memory, literature covering these memory errors has come to describe memories as “true” only if events are remembered as they actually occurred. Any memories that are remembered outside of direct experience, inferred, embellished, or those that contradict experience are considered false. “False memories involve claims about remembering. We may sincerely believe that we have experienced certain events, and feel that we recall concrete details about the events, and, yet, have never experienced those events” (Reyna & Lloyd, 1997, p. 96).

A well-accepted trend in the Developmental Psychology literature is that susceptibility to false memory declines between early childhood and young adulthood (Brainerd & Reyna, 2006). However, a reverse trend seems to be emerging in several false memory studies. This introduction will review literature showing two examples of a reverse developmental trend. The first of these applies to a laboratory type task that asks participants to remember word lists. The second uses an eyewitness paradigm proposed by Ross, Ceci, Dunning, and Toglia (1994). Both procedures yield data that suggest that younger children are less susceptible to false memory than older children.

One of the first research paradigms to study false memories involved semantic intrusions in list recall. As early as 1894, Kirkpatrick evaluated the changes in recall

and recognition in children from primary school all the way up to college level. The study did this by asking all participants to learn lists of 10 words. Kirkpatrick found that lists containing words such as “spool” or “thimble” were reported as containing the words “thread” or “needle.” Participants incorrectly recalled words that were associated with the stimulus words. Several studies followed Kirkpatrick’s work, but none have been more influential than a study by Deese in 1959.

Deese (1959) performed an experiment that yielded extraordinarily high rates of false recall. This experiment was reintroduced by Roediger and McDermott in 1995, and became known as the D/RM paradigm. It investigates the associative relationships between what they call a “critical target” and “free associates.” Deese constructed his study by assembling 36 lists of 12 words each. The lists were comprised of the first 12 most associated words to a stimulus word (also referred to as the “critical target”). For example, one list might include words such as “apple, banana, pear, and orange” that are closely related to the stimulus word “fruit.” Deese asked participants to listen to each list of words and immediately afterward, to recall as many of the words as possible. The stimulus word was recalled by a high percentage of participants. Deese found that the more semantically related the words were, the more likely participants were to recall the non-presented critical target.

When Roediger and McDermott began more experiments with such word lists in 1995, they found that there was a 40% chance that non-presented critical targets would be recalled, compared to a slightly higher 65% chance for words that had been presented. Not only did they ask participants to recall items, but they also had

participants complete a recognition task. Participants were given a list of words including all presented words, critical targets, and some foils and asked to classify each word as “old” (presented in a list) or “new” (not presented). Participants were significantly more likely to recognize non-presented critical targets than words that had actually been presented. In other words, these experiments demonstrated that participants not only recalled the critical targets, but many actually reported that they remembered seeing the word during recognition tasks.

Much of the research conducted using the D/RM paradigm has focused on older populations; little research has examined D/RM performance in children. Brainerd, Reyna, and Forrest (2002) reported that in 3 separate experiments involving 5, 7, and 11 year olds, 5-year olds had the lowest occurrence of false recall. Errors actually increased in 7-year olds and increased even more in 11-year olds. Brainerd et al. (2002) believed that the 5-year olds had the lowest false recall errors because they also had the poorest awareness of semantic relationships between words, also referred to as “gist processing.” Their results were analyzed in relation to the fuzzy-trace theory which suggests that individuals create two representations of an experience – a verbatim trace of the surface form of the experience (what they really experienced) and a gist trace of nonspecific semantic information (what they relate to their experience). Fuzzy-trace theory predicts that susceptibility to the DRM effect increases with age as the use of semantically related gist memories increases with age as well.

A study by Dewhurst and Robinson (2004) used a variant of the DRM procedure to examine the occurrence of false memory errors in children ages 5, 8, and 11 years old. In each of five word lists (adopted from research by Roediger and McDermott (1995)), they included one rhyming word. “Words were chosen on the basis that they would be familiar to children and would allow both semantic and phonological (rhyme) associations” (Dewhurst & Robinson, 2004, p. 783). The lists were read aloud to the children and they were asked to recall each list after they heard it. They found that children in each age group produced false memory errors, but there was a variance in the kinds of errors made depending on age. The youngest age group tended to make recall errors that were related phonologically to the presented words. On the other hand, the oldest age group was more likely to falsely recall words that were semantically related to words presented in the list. The middle age group (8 years old) had the greatest number of false memory errors as they would recall words associated both phonologically and semantically, as well as words that were totally unrelated. Dewhurst and Robinson (2004) noted that in previous research by Brainerd et al. (2002), the low occurrence of false memory errors for children was explained by the fuzzy-trace theory. The theory suggests that children fail to pick up on the “gist” information in the DRM lists. Dewhurst and Robinson’s (2004) findings were consistent with that the idea that as individuals develop, the encoding processes for semantically related material replace that for phonological material.

In an attempt to replicate the results of Brainerd et. al. (2002), Metzger, Warren, Price, Reed, Shelton, and Williams (2005) modified the lists of words to

include only those words that would fall into the vocabulary of children. They presented the D/RM task to second grade, eighth grade, and college level students. Participants were shown 3 lists containing 16 words each. Each list contained 16 words associated with one of two critical targets. After each list was presented, participants were asked to recall as many items as they could remember within a set amount of time. After all lists had been shown and all recall tasks had been completed, participants were asked to complete an untimed recognition task. The recognition task was composed of 48 presented words, all 6 non-presented critical targets, and 54 foils. Participants were asked to label each word as “old” (or, presented) or “new” (or, not presented). Results showed that the number of presented words accurately recalled and recognized increased with age, but, so did the number of false memory errors. In conjunction with the results from Brainerd et al. (2002), the youngest children made very few false memory errors on recall. They reported fewer accurate recall items than did older age groups, but they also made fewer errors. The most interesting find was centered on the eighth grade students. Eighth grade participants resembled the second graders on the recall task, but resembled the college students on the recognition task.

While the D/RM paradigm has become a prominent procedure in false memory research, several studies examining the suggestibility of eyewitness memory have provided more understanding of false memories and additional evidence for a possible reverse developmental trend. Several studies developed by Loftus (Loftus, 1975; Loftus, Miller, & Burns., 1978; Loftus & Palmer, 1974) have sparked hundreds

of subsequent experiments for studying false memories in relation to witnesses' testimony. A series of Loftus' experiments showed participants a sequence of 30 slides depicting events before, during, and after an automobile accident which injured a pedestrian. One of those slides was constructed to include a highly relevant detail that would help witnesses determine the driver's carelessness. For half of participants, the slide showed the driver's car at an intersection with a stop sign. For the other half of participants, the slide showed the driver's car at an intersection with a yield sign. Both signs were slightly obscured by a tree limb. After the slides had been shown, participants were interviewed about what they had seen. Included in the 20-question interview was a suggestive question: "Did another car pass the driver's car while it was stopped at the stop sign?" (for half of the participants) or "Did another car pass the driver's car while it was stopped at the yield sign?" (for the other half of participants). After a delay, participants were given a yes-no recognition test containing both presented and non-presented slides. Loftus found that participants had a low accuracy rate when asked the suggestive question that conflicted with their presented slide. Participants actually had a higher rate of recognition for slides containing the suggested sign.

Because of the work done by Loftus and other early psychologists, two formats for eyewitness identification research have emerged (Brainerd, 2005 p. 38). Both of these formats take the form of video, staged performances, or slide sequences and depict persons and events involved in a crime. After the crime is shown to participants, eyewitness identification tests are administered in either an assailant-

present format or assailant-absent format. According to Haber and Haber (2004), when the assailant is absent from a lineup, there are only two possible choices. Either participants pick another person (making a false memory error) or they pick no one. However, when the assailant is included in the lineup, participants have three possible choices. Participants can make a wrong identification, a correct identification, or no identification. A meta-analysis of more than 500 studies by Haber and Haber (2004), revealed that participants made a correct identification only 51% of the time when the assailant was present, and 27% of the time, participants incorrectly identified another person.

One memory process which may result in incorrect identifications has come to be known as “unconscious transference.” Coined by Williams in 1955, the term has come to describe the phenomenon in which participants mistake the identity of one person for another, familiar person. In a legal context, unconscious transference is believed to occur when an eyewitness misidentifies a familiar but innocent person from a police lineup because they believe that person to be the assailant (Ross et al.1994).

The first experiment to document this unconscious transference phenomenon was conducted by Buckhout in 1974. In the experiment, participants witnessed an assault on a professor. During the assault, an innocent bystander was positioned in the background. After a delay of one week, participants were asked to identify the assailant from a photo lineup. Only 40% of participants accurately identified the

assailant, while 25% of participants misidentified the innocent bystander as the assailant.

Another early study conducted by Loftus (1976) would provide even more evidence of an unconscious transference phenomenon. In this study, participants listened to an audiotape that described a crime, while looking at photographs meant to illustrate the story. When the story was over, participants were asked questions about the crime. A photo-lineup was shown to participants as they were asked to identify the assailant. Half of participants were shown a lineup with the assailant and four foils. The other half of participants were shown a lineup with the bystander and four foils. Loftus found that 84% of participants correctly identified the assailant when shown the lineup that included the assailant. Of the participants who viewed the bystander in a lineup, 60% chose the misidentified the bystander as the assailant and 24% chose a different, incorrect person.

Perhaps one of the most important studies for the phenomenon of unconscious transference was that performed in 1994 by Ross et al. In a series of experiments, the study sought to support the unconscious transference phenomenon, explain the cognitive processes responsible, and hypothesize about ways to reduce and/or eliminate the error. The experiments asked participants to watch a video including a theft scene. Participants were divided into transference and control conditions. Both conditions watched the same video except for one scene. Participants in the transference condition saw a male bystander similar in appearance to the assailant, while control participants saw a female in that same scene. After viewing the video,

participants were asked a series of questions about what they had seen. They were shown a photo lineup containing the bystander and four foils. Participants were instructed to identify the assailant from the lineup, indicate that the assailant was not in the lineup, or say that they did not know if the assailant was in the lineup. They found that participants in the transference condition were 3 times more likely to misidentify the familiar bystander than participants in the control condition. Additionally, those participants who misidentified the bystander believed the bystander and assailant to be the same person. In following experiments, researchers were able to eliminate the unconscious transference effect when participants were told that the assailant and bystander were separate people before being shown the lineup. Finally, researchers also found that participants inferred that the assailant and bystander were the same person at the first time that they observed the assailant.

In related research by Pozzulo and Lindsay (1998), attention was given to the accuracy of young children and adolescents when asked to choose an assailant from a lineup. They found that preschool-aged children had significantly lower rates of correct lineup identification than adults, with adolescents performing at a level similar to that of adults. However, if participants were presented with target (or, assailant) absent lineups, both young children and adolescents were more likely to make errors than adults (Beal, Schmitt, & Dekle, 1995; Parker & Carranza, 1989; Parker & Ryan, 1993). Such studies concentrated on children's versus adults' accuracy, but researchers soon began to question the relationship between age and susceptibility to misidentifying a bystander.

In a recent experiment, Ross, Marsil, Benton, Hoffman, Warren, and Lindsay (2006) hypothesized that older children (11-12 years old) would be more susceptible to misidentifying a bystander than younger children (5-10 years old). Participants were put in either the bystander or control conditions. Interestingly, their results showed that children in the 11-12 year old age group were more likely to misidentify the familiar bystander than younger age groups.

Although studies examining lineup identification and item-retrieval may not seem related, there is a similar finding in both types of studies that ties them closely together. In the study conducted by Metzger et al. (2005) involving the D/RM paradigm, researchers found that the youngest participants of the study (second grade students) had a significantly lower number of false memory errors than did eighth grade and college level students. In the lineup identification task, researchers noticed that the frequency of errors did not decrease with age, but was the highest with the oldest age group (11-12 years of age). The frequency of errors was also significantly higher when the lineup identification task was performed with college age students. Both types of experiments, those dealing with lineup identification and those dealing with item-retrieval, display reverse developmental trends.

However, whether or not these results stem from the same area of cognitive development is unclear. The present study approached the question by considering the relative performance on the false memory task of children who make the eyewitness identification error to those who make other errors and those who accurately recognize that the perpetrator was not in the lineup. The purpose of the present study

was to evaluate participants' consistency across both the lineup identification and D/RM tasks. The proposed hypothesis was that children who made a memory error on one task would make a similar error on the second task. In other words, children who chose the innocent bystander from the eyewitness identification task would also recall and recognize critical lures on the D/RM task.

Method

Participants

A sample of 53 children from local elementary schools participated in the study. Only those children with parental and written consent were allowed to participate. There were 31 males and 22 females. All children were within in the 3rd or 4th grades with ages ranging from 7 years old to 10 years old ($M = 8.5$, $SD = .64$).

Materials and Procedure

Before any testing took place, parental consent forms were sent to all participants' parents. All parental-consent forms were collected and only those participants whose parents had agreed to let them be in the study were tested. Additionally, before each task, participants were given written assent forms, read the instructions and asked to sign only if they wanted to participate. Participants were individually administered the lineup identification task first. After all children had been administered the lineup identification task, they were administered the D/RM task in groups. The lineup identification task took roughly 10 minutes per child to

complete while the D/RM task took 15-20 minutes to complete, depending on the size of the group.

Lineup Identification Task. Participants were shown a videotape entitled, “A Day in the Life of a Preschool Teacher.” Participants were instructed that they were going to watch a video about children playing at a preschool and were told that when the video was over, they would be asked some questions about what they had seen. The video was approximately 3 minutes in length. In the middle of the video, a male teacher (the innocent bystander) is shown reading a story to children. At the end of the video, a female teacher (the victim) is shown taking a break in the cafeteria. The female teacher sits next to a male who is similar in appearance to the innocent bystander. This male is the thief. When the teacher places her wallet on the table and walks to a vending machine, the thief removes money from her wallet and leaves the cafeteria. Both the bystander and the thief were shown in the video for the same length of time (34 seconds).

After participants had seen the video, they were presented with a five-person photo-lineup. The lineup contained the innocent bystander along with four foils. All pictures presented in the lineup were shown in color and were head-and-shoulder shots. All pictures were taken by a professional photographer and were identical in terms of lighting, background, dress, and distance from the camera. The individual pictures chosen for the lineup were constructed to be moderately fair with the innocent bystander being rated by independent judges as the most physically similar to the assailant. The photos were presented by DVD on the same television as the

video. Both the video and the lineup were taken from previous research by Ross et al. (2006).

Participants were asked to identify the man that took the money from the teacher's wallet. Participants were instructed that they could answer in one of three ways: 1) they could pick one of the five photos in the lineup, 2) they could indicate that the person who took the money was not in the lineup, or 3) they could say that they did not know if that person was in the lineup. All participants were told that the thief may or may not be in the lineup. If participants did choose a photo from the lineup, they were asked to rate their confidence on a scale consisting of "very sure," "sure," or "just guessing."

Contextual questions were also used to evaluate the occurrence of the unconscious transference phenomenon. If participants chose a photo from the lineup, they were asked if they remembered seeing any other people in the video, besides the thief. If participants indicated that the thief was not in the lineup, they were asked if any of the other photos from the lineup were seen in the video. If participants said "yes" to either of these questions, they were asked to point to that photo and tell the experimenter what that person had been doing in the video. The next question asked the participants if they specifically remembered the man that had taken the money from the teacher's wallet. If participants again said "yes," they were asked if that man had been seen anywhere else in the video besides the scene where he was taking the money. If participants said "yes," they were asked what that man had been doing. Finally, participants were asked if they remembered seeing a teacher reading a story

to children and if so, if that person was a male or female. Again, both the lineup procedure and the contextual questions were taken from a previous study by Ross et al (2006). At the end of the task, participants were allowed to leave.

D/RM Task. All materials, as well as the procedure, were taken from previous research by Metzger et al. (2005). Participants were presented three lists consisting of 14 words per list, as shown in Table 1. In each list, 7 associate words were presented which coincided with a non-presented critical target word. All words were presented visually by PowerPoint format. Words were shown at a rate of 2 seconds per word. After each list was presented, participants were given 2 minutes to recall and write down as many words as they could remember from the list. Following the third and final list, participants' recall papers were collected and participants were given a 180-word, untimed, recognition task to complete. Participants were instructed to classify each word as being "shown in the list" or "not shown in the list." Beside each word, participants were asked to circle "yes" if they remembered seeing the word presented in a list and to circle "no" if they had not seen the word presented. At the end of the recognition task, participants were debriefed and taken back to their classroom.

Results

The data analysis for this study followed a two step process. First, the data from both Ross et al. (2006) and Metzger et al. (2005) were examined to determine how the present sample compared with previous research. Then, a systematic

analysis of the data was conducted to evaluate the primary hypothesis of the present study.

Lineup Identification Task

The frequencies of each identification possibility were analyzed. As shown in Table 2, results showed that 42% of participants were more likely to correctly choose “Not in Lineup” than any other answer. Out of those participants that did choose a person from the lineup, 38 % chose someone other than the bystander, while only 19% reported the innocent bystander as the assailant. A very small percentage of participants, only 2%, reported that they did not know if the assailant was in the lineup.

In comparison to previous data by Ross et al. (2006), a relatively similar amount of participants chose the innocent bystander or another foil as the assailant. However, the rates for both the correct answer and the “Do Not Know” response were almost opposite of the results found by Ross et al. (2006). Previous data involving participants ages 5-8 years old found that only 15%-16% of participants correctly reported the assailant as “Not in Lineup,” while 42% reported that same response in the present study. Additionally, in previous research, 35% of participants ages 5-6 years old and 9% of participants ages 7-8 years old reported that they did not know if the assailant was in the lineup, compared with only 2% of participants in the present study.

Based on their lineup response, participants were classified into one of three categories: (a) Misidentification, (b) Correct, and (c) Other Errors. Participants in the “Misidentification” group picked the innocent bystander from the lineup. Participants in the “Correct” group were those that reported the assailant to be absent from the lineup, and participants in the “Other Errors” group chose any other foil or reported that they did not know if the assailant was in the lineup.

While results of Ross et al. (2006) did not report the proportion of participants who made the unconscious transference error, I observed in the present study that 40% of participants in the Misidentified group also reported that they had seen the assailant elsewhere in the video. However, 39% of participants in the Correct group also reported that he had been seen elsewhere in the video, as well as 33% of participants in the Other Errors group. Within each of these groups, the various responses as to *where* the assailant had been seen previously were examined. In the Misidentification group, only 25% of participants believed that the assailant had been reading the story to children. In the Other Errors group, this number rose slightly to 43%. Surprisingly, the participants in the Correct group had the highest percentage of participants, 75%, that reported the assailant as the story reader. In a way of validating participant’s attention to the video, all participants in the study were asked if they remembered a scene in the video in which a teacher had been reading a story to children. Rates of unconscious transference are shown in Table 3. Almost all participants, 91%, remembered this scene while only 9% did not.

D/RM Comparison of Scores

Memory performance was measured by the percentage of accurate recall and recognition, as shown in Table 4. The results were similar to those of previous research by Metzger et al. (2005). On recall, participants had an accuracy rate of 47% as compared to percentages of 39% and 34% in previous research. Their accuracy rate on recognition was 66% compared with previous data with rates of 63% and 70%. When the percentages of critical targets was analyzed, it was found that on recall, rates again looked similar to previous research, with current participants having a rate of 1% to previous rates of 2% and 3%. Participants' rates of critical target recognition were slightly lower than previous research with a percentage of 15% compared with rates of 22% and 23%.

How Eyewitness Identification and D/RM Relate

A one-way analysis of variance (ANOVA) was used to examine the proportion of accurate and false recall and recognition, with the Eyewitness Response Category as the between subjects variable. Results showed no significant differences between groups on accurate recall $F(2, 49) = .17, p < .05$, and accurate recognition $F(2, 49) = .28, p < .05$. However, results did indicate that there was a significant difference between groups on the recall $F(2, 49) = .03, p < .05$, and recognition $F(2, 49) = .05, p < .05$, of critical lures. Participants in the Misidentification group had a significantly lower number of critical targets recalled ($M = .00$) and recognized ($M =$

.08) relative to the rates in the Other Errors group on recall ($M = .07$) and recognition ($M = .21$).

Post hoc tests were conducted to better analyze the differences between groups. All post hoc tests were performed using Tukey's b. Results again showed a significant difference between participants in the Misidentification and Other Errors groups, $p < .05$, on the recall of critical targets. Additionally, post hoc tests also confirmed a difference between the Misidentification and Other Errors groups on the recognition of critical targets, $p < .05$. Results from the ANOVA and post-hoc tests are shown in Table 4.

Discussion

A majority of results from the present study replicate the results demonstrated in previous research by Ross et al. (2006) and Metzger et al. (2005). However, there are a few discrepancies that are interesting to note. On the eyewitness identification task, participant performance more closely resembled the performance of the youngest age group (5-6 year olds) in previous research by Ross et al. (2006). The most striking difference between the present data and previous results by Ross et al. (2006) was the significant increase in the percentage of participants who chose the correct answer, "Not in Lineup." This percentage was more than double what previous results had indicated. The reason for this is not very clear, but could have been caused by differences in the instructions given to participants. After analysis of the present study's instructions, as well as the instructions by Ross et al. (2006), it did

not appear that there were any instructions that differentiated between the two. However, researchers giving the instructions could have had differentiations in the tone of their voice, the emphasis placed on different answer choices and could have even given participants cues for answers unknowingly.

A comparison of the D/RM data from the present and from the past study by Metzger et al. (2005) showed that results were as expected for the present age group. Participants in the present and previous studies had very similar rates of accurate recall and recognition, as well as similar rates of critical target recall and recognition.

I predicted that children who misidentified the bystander in the eyewitness identification task would also have intrusions of critical targets in recall and recognition. When the data were analyzed, results supported the hypothesis. Participants who made the bystander error were susceptible to false memory errors on recall and recognition. However, participants who made the bystander errors were not the most susceptible to false memory errors on the D/RM task. Something that the hypothesis did not take into account was the possibility that another group of participants would have an even higher likelihood of false memory intrusions. Results revealed that participants in the Other Errors group had the highest level of false memory errors on the D/RM task. Surprisingly, it was the participants who chose anyone besides the bystander or reported that they did not know if the assailant was included in the lineup that had a significantly higher rate of critical target inclusions.

Theoretical Explanations

Several theories have been developed to explain the cognitive processes behind false memory and these may help explain the results of the present study. The most popular of these theories is called the fuzzy-trace theory. The theory was originally developed as a model of reasoning and decision making, not an explanation of false memory (Brainerd, 2005, p. 83). Motivated by two notions, it sought to (a) “determine how semantic effects in psycholinguistics relate to memory processes,” and (b) “explore many counterintuitive findings which question how memory development is related to the development of specific reasoning abilities” (Brainerd, 2005, p. 83). For many years, psychologists answered both questions with theories of constructivism and working memory capacity. Constructivism suggests that interpretations of linguistic inputs “are not veridical in any bona fide way, but rather, are transformed (constructed) by the same reasoning operations that are used to make linguistic inferences or solve problems” (Brainerd & Reyna, 2004, p. 397). Working memory capacity, on the other hand, suggests that problem information that is retained and the application of processes used to problem-solve both use the same limited-capacity system. This means that one’s accuracy of the problem information and one’s reasoning are affected by the same limited-capacity variable. Both of these theories’ predicted that individuals’ performance on problem solving, as well as their memory performance, should be very closely related. However, as more research on false memories was conducted, it became clear that these predictions conflicted with large amounts of data. New data showed “high levels of statistical independence and experimental dissociation” (Brainerd & Reyna, 2004, p. 397). Thus, fuzzy-trace

theory was born in an attempt to account for these findings. The fuzzy-trace theory suggests that individuals form two separate representations of an experience: (a) a verbatim copy of the surface form of experience, and (b) a gist trace of nonspecific semantic information.

So far, the fuzzy-trace theory has mainly been applied to the results of tasks like the D/RM task. In such tasks, the fuzzy-trace theory predicts that young children will not show susceptibility to false memory errors because they fail to create gist memories that are semantically related, as the D/RM lists were. Fuzzy-trace theorists argue that children's cognitive capacities have not yet developed the ability to use gist memories as another source of information retrieval. These theorists believe that children rely more heavily on verbatim memory. Can the fuzzy-trace theory also account for the surprising results demonstrated by the Other Errors group on the Eyewitness Identification task?

As stated previously, the phenomenon of choosing the bystander in the eyewitness identification task is sometimes referred to as "unconscious transference." Findings in previous research by Ross et al. (1994) indicated that when someone misidentifies a familiar bystander, they are doing so because they have misperceived the assailant as the bystander and believe that they are the same person who was seen in two places. Ross et al. (1994) discussed three theoretical possibilities on which their experiments were based. The first of these was a traditional automatic processing approach which suggested that witnesses were unaware that they had had a previous encounter with the bystander. When the witness saw the familiar bystander

in a lineup, they unconsciously brought up a stored memory of the bystander and thus increased the likelihood of choosing the bystander as the assailant. The second theoretical approach was that of deliberate source monitoring. This theory suggested that witnesses consciously remembered the bystander and assailant as different people. However, the witness confuses the two distinct memories because the bystander and assailant are similar in appearance. The third theoretical approach is known as conscious-inference (at encoding) and suggests that witnesses involuntarily infer that the bystander and assailant are the same person because they misperceive the bystander as the assailant at the scene of the crime. Ross et al. (1994) thus incorporated a series of contextual questions to determine if any of these theories could be exhibited by participant's memories of individuals' actions and locations in the video. The analysis of those contextual questions indicated that conscious-inference was playing a role in the unconscious transference phenomenon. However, these theories were tested using only adult participants. Later studies by Ross et al. (1998) and Ross et al. (2006) studied unconscious transference in children and again found that conscious-inference seemed to be playing a role in the misidentification of a bystander.

The basis of the conscious inference model centers around a perceptual confusion. The witness misperceives the assailant as the bystander at the scene of the crime because of their similarities in appearance. Later on, when asked to choose an individual from a lineup, the witness makes no or little effort to remember what could be classified as the "verbatim" information – the individual memories of the

bystander and assailant. It is theorized that the assailant's face acts a retrieval cue for the bystander's face when the witness sees the assailant in the crime scene.

Consequently, the conscious-inference idea blends with fuzzy-trace theory's idea of verbatim and gist memories. Verbatim memory is the surface form of the experience, or the physical/visual stimuli as it was presented to participants. In the case of the D/RM task, verbatim memories would be considered the words presented and/or the placement of a particular word within a list. In the case of the eyewitness identification task, verbatim memories might be thought of as separate memories of each individual seen in the video – what each person was doing and where they were first seen. It is theorized that young children rely primarily on verbatim memory when asked to recall an event. Even though verbatim memory deteriorates more rapidly in children than in adults, using verbatim memory decreases the production of false memory errors because it contains memories of the original information, with no added inferences.

Gist memories, on the other hand, are considered to be the non-specific information inferred by the participants themselves. Gist memories on the D/RM task would include ideas of word categories and/or how the words within a list are related. On the eyewitness identification task, gist memories would be considered the perception that the bystander and assailant are the same person due to their similar physical appearance. As age increases, so does the use of both verbatim and gist memories to recall information. The more that gist information is used, the more that false memory errors occur.

An increased use of gist memories is a plausible explanation for the results found in the present study. Not only was there an increased rate of false memory errors for participants who chose the bystander, but that rate also increased for participants who chose any of the other foils. While these results may indicate that participants in the Other Errors group may be more likely to use gist memories than any other information when asked to recall events, there is no way to be certain without conducting the same research using a control group. The Other Errors group seems to have created a gist memory that includes only a general representation of the physical features of the assailant. As such, it would be very difficult for them to choose the correct answer for the lineup identification considering that all foils in the lineup looked reasonably similar to the assailant. When asked to choose an individual from the lineup, they simply chose the individual that they felt best matched the assailant's physical features. Such participants seem to be relying more on similarity rather than familiarity to make their decisions. If, in fact, these participants rely more heavily on gist memories, it would only follow that they would also have the highest degree of false memory errors on the D/RM task.

Limitations

While this study provides some interesting new information about correlations between false memory errors, there are some limitations to be discussed. One limitation of this study was the number of conditions used in the eyewitness identification task. In the previous study by Ross et al. (2006), two conditions were

used: a transference condition and a control condition. The transference condition was the only condition used in this study. In the previous study, the control condition participants saw the same exact video as the one used in the present study. However, one scene was different. In place of the male innocent bystander, a female was shown reading a story to children. Then, participants were shown an assailant-absent lineup and asked to identify the assailant, report him to be absent from the lineup, or report that they did not know whether or not the assailant was present in the lineup. In the present study, our focus was on participant's misidentification of the bystander. In theory, we excluded an entire group from the data: a group that had no exposure to a bystander, but exposure to only an assailant. In this study, we have no way of knowing that the participants would have chosen the correct answer for the lineup despite having no possibility of confusing an assailant with a bystander. Another obvious limitation was the number of participants who participated in the study. An increased number of participants could have made the effect more reliable.

Future Research

Future research should begin by conducting this same experiment using both the transference and control conditions of the eyewitness identification task. It would be interesting to note any differences in word recall and recognition between participants who had been exposed to an innocent bystander, and are therefore subject to the unconscious transference possibility, and participants who were only exposed to the assailant and were given an assailant-absent lineup. Future research might also want to look at the results displayed by an assailant-present lineup. Would a

significant number of participants in the control condition misidentify other innocent individuals from the lineup, as did the participants in this study? Would participants who did so also make a significantly higher rate of false memory errors in recall and recognition than participants in the other eyewitness response categories? These are questions that future research may be able to answer.

Additionally, the correlation between these two types of memory errors should be examined in a variety of age groups. Both studies by Ross et al. (2006) and Metzger et al. (2005) have found that there are significant differences in performance based on the age of participants. However, no research to date has examined whether the results of children in varying age groups coincide between these two experiments. Such research would add considerable knowledge to the area of reverse developmental trends.

References

- Beal, C.R., Schmitt, K.L., & Deckle, D.J. (1995) Eyewitness identification of children. *Law and Human Behavior*, *19*, 197-216.
- Brainerd, C.J., & Reyna, V.F. (in press). Explaining developmental reversals in false memory. *Psychological Science*.
- Brainerd, C.J., Forrest, T.J., Karibian, D., & Reyna, V.F. (2006). Development of the false memory illusion. *Developmental Psychology*, *42*(5), 962-979.
- Brainerd, C. J., & Reyna, V. F. (2005). *The Science of False Memory*. New York, NY: Oxford University Press.
- Brainerd, C. J., & Reyna, V. F. (2004). Fuzzy-trace theory and memory development. *Developmental Review*, *24*, 396-439.
- Brainerd, C.J, Reyna, V.F., Wright, R., & Mojardin, A. H. (2003). Recollection rejection: false-memory editing in children and adults. *Psychological Review*, *110*(4), 762-784.
- Brainerd, C.J., & Reyna, V.F. (2002). Fuzzy-trace theory and false memory. *Current Directions in Psychological Science*, *11*(5), 164-169.
- Buckhout, R. (1974). Eyewitness testimony. *Scientific American*, *231*, 23-31.
- Ceci, S.J., Papierno, P.B., & Kulkofsky, S. (2006). *Representational constraints on children's suggestibility*. Unpublished manuscript, Cornell University.
- Ceci, S.J., Toglia, M., & Ross, D. (1988). On remembering – more or less: A trace strength interpretation of developmental differences in suggestibility. *Journal of Experimental Psychology: General*, *117*(2), 201-203.

- Cole, W.G., & Loftus, E.F. (1979). Incorporating new information into memory. *The American Journal of Psychology*, *92*, 413-425.
- Dewhurst, S. A., & Robinson, C. A. (2004). False memories in children: Evidence for a shift from phonological to semantic associations. *Psychological Science*, *15*(11), 782-786.
- Gross, S.R., Jacoby, K., Matheson, D.J., Montgomery, N., & Patil, S. (2005). Exonerations in the United States: 1989 through 2003. *The Journal of Criminal Law & Criminology*, *95*, 523-560.
- Kirkpatrick, E. A. (1894). An experimental study in memory. *Psychological Review*, *1*, 602-609.
- Loftus, E. F. (1976). Unconscious transference in eyewitness identification. *Law and Psychology Review*, *2*, 93-98.
- Marsil, D. F. (1999). *Unconscious transference in children*. Unpublished master's thesis, University of Tennessee at Chattanooga.
- Metzger, R.L., Warren, A. R., Shelton, J. A., Price, J. D., Reed, A. W., & Williams, D. (2005). *Do children D/RM like adults? False memory production in children*. Manuscript submitted for publication.
- Parker, J.F., & Carranza, L.E. (1989). Eyewitness testimony of children in target present and target absent lineups. *Law and Human Behavior*, *13*, 133-149.
- Parker, J.F., & Ryan, V. (1993). An attempt to reduce guessing behavior in children's and adults' eyewitness identifications. *Law and Human Behavior*, *17*, 11-26.

- Pozzulo, J.D. & Lindsay, R.C.L. (1998). Identification accuracy of children versus adults: A meta-analysis. *Law & Human Behavior*, 22, 549-570.
- Price, J. L., Metzger, R., Williams, D., Phelps, N. Z., & Phelps, A. M. (2001). *Children produce as many false memories as adults (sometimes!)*. Unpublished manuscript, University of Tennessee at Chattanooga.
- Read, J.D., Tollestrup, P., Hammersley, R., McFadzen, E., & Christensen, A. (1990). The unconscious transference effect: Are innocent bystanders ever misidentified?. *Applied Cognitive Psychology*, 4, 3-31.
- Reyna, V.F. (2000). Fuzzy-trace theory and source monitoring: An evaluation of theory and false-memory data. *Learning and Individual Differences*, 12, 163-175.
- Reyna, V.F., & Lloyd, F. (1997). Theories of false memory in children and adults. *Learning and Individual Differences*, 9, 95-123.
- Ross, D.F., Marsil, D.F., Benton, T.R., Hoffman, R., Warren, A.R., Lindsay, R.C.L., et al. (in press). Children's susceptibility to misidentifying a familiar bystander from a lineup: When younger is better. *Law and Human Behavior*.
- Ross, D.F., Benton, T.R., McDonnell, S., Metzger, R., & Silver, C. (2006). When accurate and inaccurate eyewitness look the same: A limitation of the 'pop-out' effect and the 10-to-12 second rule. *Applied Cognitive Psychology*, 20, 1-14.

- Ross, D.F., Ceci, S.J., Dunning, D., & Tolia, M.P. (1994). Unconscious transference and mistaken identity: When a witness misidentifies a familiar but innocent person. *Journal of Applied Psychology, 79*, 918-930.
- Sugrue, K., & Hayne, H. (2006). False memories produced by children and adults in the DRM paradigm. *Applied Cognitive Psychology, 20*, 625-631.
- Williams, G. (1995). The proof of guilt. Springfield, IL: Charles C. Thomas.

Appendices

Forms Used For Data Collection

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Appendix 1
Informed Consent Form

Dear Parents,

We would like to ask your permission to allow your child to participate in a study of memory. This research is being conducted for an honor's project at the University of Tennessee at Chattanooga, and will be carried out by Kimberly Brooks and other UTC students who will be supervised by faculty members in the department of Psychology. The study will involve two tasks that will take approximately 10-15 each. The tasks will be given a couple of weeks apart. The information gathered from this study will help us better understand the development of children's memory.

The first task will ask your child to memorize simple lists of words. The lists will be shown to the class and each child will be asked to write down all the words they can remember after each list has been shown. Then, each child will be given a large list of words and asked to circle words. In the second task, children will watch a video about a day in the life of a preschool teacher. At the end of the video, a preschool teacher is shown in a cafeteria taking a break. When she goes to get a drink from a vending machine, she leaves her wallet on a table, and a man takes money from it. When the video is over, your child will be asked to describe what happened and will be asked to help us pick the "thief" from a photo lineup.

We have used these tasks for several years and the children seem to enjoy the experience. The "theft" of the money does not seem to upset them and we take care to make sure the children understand that no one will be punished as a result of their responses.

We would greatly appreciate it if you would allow your child to participate. We will take every step possible to ensure that the children have fun, and that only those children who want to participate are asked to do so. Your child's responses will be entirely confidential and will not be reported individually at any time. Your child will participate in the study during school, with their teacher's approval and will not miss important instructional time. Please read the attached permission form, and return it to your child's teacher, whether or not you will allow your child to

participate. You and your child are under no obligation to participate. We'd appreciate it if you do not tell them in advance about the video; we need to get their first reaction to the events without them knowing there will be a "theft" and that they need to remember the "thief." If you would like for your child to participate, please do not inform them of this study or any of the procedures before they take place. If you have any questions, or would like to see the video and/or lists of words before you decide, please feel free to call us anytime at (931) 581-3811. Thank you for your time.

Sincerely,

Kimberly R. Brooks
Kimberly-Brooks@utc.edu
University of Tennessee at Chattanooga

Dr. Richard Metzger
University of Tennessee at Chattanooga
Psychology Department

Dr. Amye Warren
University of Tennessee at Chattanooga
Psychology Department

Dr. David Ross
University of Tennessee at Chattanooga
Psychology Department

Appendix 2
Parental Permission Form

(Check one below)

_____ Yes, I agree to allow my child to participate in the memory study. I understand what is involved in the research. I understand that I may withdraw my child from the study at any time for any reason without penalty. I also understand that my child's results will be confidential, and my child's name or any other information identifying my child individually will not be used in any report of the results. I am entitled to a copy of the result summary, and can obtain a copy by contacting the researchers.

_____ No, I do not wish for my child to participate in the memory study.

Child's Name

Parent's Name

Parent's Signature

Parent's Phone Number

_____ Check here if you have questions about the study and would like to be contacted. If so, please make sure you provide your phone number in the space above.

Appendix 3
Written Assent Form for D/RM Task

Deese/Roediger-McDermott Task

We want to learn about the memory of children. We would like to see if you want to be in this study about memory. Students at the University of Tennessee at Chattanooga will be doing this study.

You will be asked to look at lists of words. When each list has been shown, you will be asked to write down all the words you can remember from the list. When all the lists have been shown, you will be given a big list of words. In this list will be words that were and were not shown in the other lists. You will be asked to circle “yes” if you remember seeing that word and “no” if you do not remember seeing that word.

You will not be punished for any of your answers. We just want you to do your best. Your answers will be kept private and only the researchers doing the study will be able to see them. You do not have to participate if you don’t want to and you can quit at any time. If you have any questions, you can ask us at any time.

Child’s Statement

The researchers have told me about the research. I had a chance to ask questions. I know I can ask questions at any time. I **WANT** to be in the research.

Signature of Child _____ Date _____

Appendix 4
Written Assent Form for Eyewitness Identification Task

Ross Identification Task

We want to learn about the memory of children. We would like to see if you want to be in this study about memory. Students at the University of Tennessee at Chattanooga will be doing this study.

You will be shown a video about a day in the life of a Preschool Teacher. After you watch the video, you will be asked some questions about it. All you need to do is answer the questions as best you can.

You will not be punished for any of your answers. We just want you to do your best. Your answers will be kept private and only the researchers doing the study will be able to see them. You do not have to participate if you don't want to and you can quit at any time. If you have any questions, you can ask us at any time.

Child's Statement

The researchers have told me about the research. I had a chance to ask questions. I know I can ask questions at any time. I **WANT** to be in the research.

Signature of Child _____ Date _____

Appendix 5 Procedure for D/RM Task

Introduction

Thank you for coming today. My name is _____, and I am so glad that you decided to participate in this study. Please listen carefully to the instructions I'm going to give you. When we start the study, it is very important that you do not talk to the person sitting beside you or look at their answers. We want to know your individual answers. After we finish the study, we can answer any questions you have.

Before we begin, there is a sheet of paper called a written assent form that I need you to read. When you have read it, please print your name at the bottom. By printing your name, you are saying that you are volunteering to participate in our study.

Before Presenting Lists

I'm going to show you three lists of words. Each word will be shown one at a time. At the end of the list, you will see a screen that says, "Recall List 1/2/3 items now." When you see that screen, write down as many words as you can remember on your recall form under "List 1." You will have two minutes to try and remember words. At the end of all the lists, you will see a screen that says, "Recognition Task." When you see this screen, put your pencil down and wait for more instructions.

Start PowerPoint slideshow.

After the Slideshow

Instruct participants to turn their recall forms over, face down. Hand out the recognition task.

Recognition Task

Look at the list of words in front of you. For each word, please circle "yes" if you remember seeing the word in one of the lists. Please circle "no" if the word was not shown in the any of the three lists. Please turn in all of your papers to me when you are finished. Once you have finished, you have completed the study and may leave. If you have any questions, please let me know and I will try to answer them for you. Thank you for participating.

Appendix 7
Example Recognition Form

Circle: YES = Words seen on the lists; NO = Words not seen on the lists

ID# _____	Age _____	Gender: _____ M _____ F
1. honey	YES	NO
2. chilly	YES	NO
3. note	YES	NO
4. dentist	YES	NO
5. hill	YES	NO
6. climber	YES	NO
7. horn	YES	NO
8. jazz	YES	NO
9. bed	YES	NO
10. light	YES	NO
11. sock	YES	NO
12. downy	YES	NO
13. over	YES	NO
14. cherry	YES	NO
15. ill	YES	NO
16. mountain	YES	NO
17. wake	YES	NO
18. sitting	YES	NO
19. range	YES	NO
20. air	YES	NO
21. rest	YES	NO
22. frigid	YES	NO
23. band	YES	NO
24. doctor	YES	NO
25. freeze	YES	NO
26. tart	YES	NO
27. hospital	YES	NO
28. slumber	YES	NO
29. climb	YES	NO
30. doze	YES	NO
31. sour	YES	NO
32. orchestra	YES	NO
33. daughter	YES	NO
34. bowl	YES	NO
35. wood	YES	NO
36. heart	YES	NO
37. blanket	YES	NO
38. table	YES	NO
39. dress	YES	NO
40. sing	YES	NO
41. kitten	YES	NO
42. young	YES	NO
43. surgeon	YES	NO
44. recliner	YES	NO
45. radio	YES	NO
46. desk	YES	NO
47. top	YES	NO
48. kiwi	YES	NO
49. winter	YES	NO
50. bike	YES	NO

Appendix 8

Procedure for Eyewitness Identification Task

Introduction

Thank you for coming today. My name is _____, and I am so glad that you decided to participate in our study. Please listen carefully to the instructions I'm going to give you. When we start the study, it is very important that you do not talk to the person sitting beside you or look at their answers. We want to know your individual answers. After we finish the study, we can answer any questions you have.

Before we begin, there is a sheet of paper called a written assent form that I need you to read. When you have read it, please print your name at the bottom. By printing your name, you are saying that you are volunteering to participate in our study.

Collect assent forms.

Before Showing Video

I'm going to show you a video about kids playing in a preschool. After watching the video, I'm going to ask you a couple of questions about what you saw in the video. So please watch the video very closely and if you can't hear or see the video at any time, please let me know.

Get DVD ready to play – make sure to note what condition is played. Insert disc into DVD drive. Window will pop up. When you are ready to start, click on “okay.” “A Day in the Life of a Preschool Teacher” will show up. Click on word “play” beneath.

After the Video

Now I'm going to ask you a few questions about what you saw in the video. Please answer the questions the best that you can.

Get lineup DVD set up – make sure it is Bystander present lineup. DVD play window will show up – don't click on anything yet.

Lineup Procedure

I'm going to show you five pictures. If you see a picture of the man that took the money from the wallet, please point to that picture. If the man who took the money is not in any of the pictures, tell me he is not in the pictures. If you don't know

or can't remember, just tell me that you don't know. Do you understand the instructions? [Make sure the children understand the instructions. Repeat the instructions again if needed. Record all of their responses on the correct form.]

Now click on "okay" icon in the window that popped up when you inserted the lineup DVD. Then click on "view lineup" to get it to full-screen size.

Confidence Question

IF CHILD MADE IDENTIFICATION: How sure are you that the man you picked was the one that took the money from the wallet? Are you VERY SURE, SURE, OR JUST GUESSING?

IF CHILD SAID "NOT IN LINEUP": How sure are you that the person who took the money is not in any of the pictures? Are you VERY SURE, SURE, OR JUST GUESSING?

Context Questions

IF CHILD MADE NO IDENTIFICATION: Did you see any of these men in the video?

IF YES: Can you point to that man? THEN ASK: What was he doing in the video?

IF THEY MAKE IDENTIFICATION: Did you see any of these other people in the video?

IF YES: Point to that person. THEN ASK: What was that person doing in the video?

If you remember the man who took the money from the wallet, can you tell me if you saw that man in any other place in the video – besides where you saw him taking the money?

IF YES: Where did you see him in the video?

Do you remember if a teacher read a story to the children?

IF YES: Was that teacher a man or a woman?

When you have finished these questions, remove the lineup from the screen by pressing escape, and then close the window.

Now we have finished the study. Thank you again for participating. If you have any questions, please let me know and I'll try to answer them for you.

Appendix 9

Data Collection Form for Eyewitness Identification Task

Test Date: _____
 Tester: _____
 Test Site: _____
 Condition: _____

Child's Name (print): _____

Gender: M _____ F _____

Birthdate: _____

Age: _____

Lineup: (Circle One)

Person #1 Person #2 Person #3 Person #4 Person #5

Not in Lineup

I Don't Know

1) If you picked a person out of the lineup, how sure are you that the person you picked was the one who took the money from the wallet?

VERY SURE

SURE

JUST GUESSING

2) If you said that the person who took the money was not in the lineup, how sure are you?

VERY SURE

SURE

JUST GUESSING

3) If you DID NOT pick anyone from the lineup, did you see ANY of them in the video?

_____ NO _____ YES

3A) If YES, tell me which person or persons you saw and what they were doing in the video.

_____ Person #1: _____

_____ Person #2: _____

_____ Person #3: _____

_____ Person #4: _____

_____ Person #5: _____

4) If you DID pick someone from the lineup, did you see any of these other people in the video?

_____ NO _____ YES

4A) If YES, tell me which person or persons you saw and what they were doing in the video.

_____ Person #1: _____

_____ Person #2: _____

_____ Person #3: _____

_____ Person #4: _____

_____ Person #5: _____

5) Do you remember the man who took the money from the wallet?

_____ NO _____ YES

5A) If YES, did you see that man any other place in the video, besides where you saw him taking the money?

_____ NO _____ YES

5B) If YES, where did you see that man in the video?

6) Did a teacher read a story to the children?

_____ NO _____ YES

6A) If YES, was the teacher that read the story a man or woman?

_____ MAN _____ WOMAN

Table 1

List 1.	List 2.	List. 3.
Nurse	Note	Bed
Sour	Apple	Shoe
Sick	Sound	Rest
Candy	Vegetable	Hand
Lawyer	Piano	Awake
Sugar	Orange	Toe
Medicine	Sing	Tired
Bitter	Kiwi	Kick
Health	Radio	Dream
Good	Citrus	Sandals
Hospital	Band	Wake
Taste	Ripe	Soccer
Dentist	Melody	Snooze
Tooth	Pear	Yard
Sweet **	Fruit**	Sleep**
Doctor**	Music**	Foot**

** Critical Target Word

Table 2

Eyewitness Identification Accuracy

Identification	Present Study (%)	Ross (5-6 Years) (%)	Ross (7-8 Years) (%)
Bystander	18.9	18	40
Not in Lineup	41.5	16	15
Other Answers:			
Foil	37.7	31	36
Don't Know	1.9	35	9

Table 3

Rates of Unconscious Transference

Question	Misidentified (%)	Correct (%)	Other Errors (%)
Question 5A*			
Yes	40	39	33
No	60	61	67
Question 5B**			
Reading Story	25	71	43
Other Location	75	29	57

* Question 5A asked participants if the assailant had been shown at any other point in the video besides where he was shown taking money.

** If participants answered yes to 5A, Question 5B asked participants to report what the assailant had been seen doing earlier in the video.

Table 4

DRM Accuracy and Lures

Task	Present Study (%)	Metzger, et al. (Exp. 3) (%)
Recall		
Accurate	47	39
Critical Targets	3	1
Recognition		
Accurate	66	70
Critical Targets	15	22

Table 5

Comparison of Eyewitness Identification and D/RM

Task	Misidentified (%)	Correct (%)	Other Errors (%)
Recall			
Accurate	44	46	53
Critical Targets	0	2	07
Recognition			
Accurate	74	61	68
Critical Targets	08	12	21