The Effects of Gender and Misleading Postevent Information on Eyewitness Memory

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Abstract

Eyewitness memory can be compromised due to misleading post event suggestion. In order to better facilitate the acceptance and validity of eyewitness testimony researchers must first identify and rectify the flaws associated with this type of testimony in order to produce a more effective manner of identification. 58 participants viewed two 2 min clips of chase scenes from two motion films. After each clip, the participants answered a set of questions pertaining to each clip as well as wrote a brief summary. The effects of gender and MPI separately were significant however the interaction of the two were not. In this study, MPI had an overwhelming effect on eyewitness memory. Overall, males averaged the highest number of correct questions and details.
The Effects of Gender and Misleading Postevent Information on Eyewitness Memory

Eyewitness testimony is an integral part of the decision making process, consequently, eyewitness memory can be compromised due to misleading post event suggestion (Zaragoza & Lane, 1994). To date, more than 200 DNA-based exonerations have been documented, and in approximately 75% of these cases, mistaken identification was cited as one primary contributing factor for the conviction (Scheck & Neufeld). Previous research has barely begun to broach the application of both gender and misleading postevent information in one cohesive study. In order to better facilitate the acceptance and validity of eyewitness testimony researchers must first identify and rectify the flaws associated with this type of testimony in order to produce a more effective manner of identification.

Episodic memory, a construct of long-term memory, is a theoretical neurocognitive retrieval system enabling human beings to remember past events. It is essentially broken down into three components- self, awareness of self, and awareness of time and is unique in that it allows a person to retrieve and relive personal experiences in ways that no other memory process is able (Tulving, 2002). One aspect of episodic memory that has gained notable interest is eyewitness memory, though research in this particular area has focused more on the problems rather than the theories (Davies, 1995). Eyewitness memory is the process involved in committing to memory the details of a particular witnessed event or series of visual stimuli.

Witnessing a violent crime can be a traumatic event in a person’s life, particularly if it is a first-person event. Being a first-hand witness causes higher levels of arousal than being a witness to a previously recorded event or set of visual stimuli. On the other hand, Ihlebæk, Love, Eilertsen, and Magnussen (2003) reported that real life witnesses are often closer in proximity to the action, though they do not have the same opportunities to observe all aspects of the event due
to a variety of reasons. Witnesses in the laboratory watching a recording of a staged crime reported more details with an overall higher accuracy report than witnesses who were part of the crime scene.

Each person perceives real world scenes differently and tends to remember different features about the scene. Objects that are consistent within the context of the scene are usually well recalled but poorly recognized (Silva, Groeger, & Bradshaw, 2006). Moreover, objects that are inconsistent with the environment of the scene are generally well recognized but poorly recalled.

Misleading Postevent Information (MPI), or information that is presented to an eyewitness after he or she witnessed an event, has sparked numerous studies; though the extent of its impact on memory is still under debate. A phenomenon called the misinformation effect (Loftus & Hoffman, 1989) has been linked to the memory impairment hypothesis. These theories are based on the idea that misleading postevent information affects or impairs the memory of the original event.

Though researchers manipulate MPI within studies, it is certainly not globally irrelevant. Benign interaction between individual witnesses to an event, overhearing another witness’s account of the event, or even new information acquired from various sources can cause the alteration of the original memory within the mind of the first-hand witness (Loftus & Hoffman, 1989). Researchers have also identified certain conditions in which postevent information is most likely to influence an eyewitness’s account of the original event. Specificity of the questioning as well as the strength of the memory of the original event both play a major role in the effectiveness of MPI in memory impairment (Sutherland & Hayne, 2001)
On the other hand, the misinformation acceptance theory (McCloskey, & Zaragoza, 1985) suggests that memory of the original event is not impaired by MPI, rather that the result is from misinformation acceptance. Though the participants accepted and believed that the misinformation actually appeared in the original event, significant differences between the groups were not identified. Apparently, the tasks given to the participants were insensitive to discriminating impairment (Belli, 1989). A potential reason McClosky and Zaragoza (1985) failed to find a difference between the groups is that there is a relatively high rate of correct rejection of the new information (Tversky & Tuchin, 1989).

More recent studies have attempted to interpret previous findings and provide potential alternatives to the memory impairment hypothesis. One alternative is that witnesses sometimes forget the source of the misleading information. Though findings suggest that misleading suggestions impair participants’ ability to remember event details, memories of suggestions are less likely to be attributed to the event when the sources of event details and suggested details are highly distinguishable (Lindsay, 1990).

Gender is a variable that is also being closely examined in current research because it is becoming more evident that many differences exist between genders. Females generally remember fine details better than males; males on the other hand will better remember more logical and spatial aspects (Loftus, Levidow, & Duensing, 1992). Studies tend to be split evenly between which gender does better on which tasks however, they tend to differentiate on what types of information they remember. Women tended to perform on a higher level than men on recall and recognition of episodic information (Maitland et al., 2004).

When a person witnesses a crime or a traffic accident they are often called upon to recall precise details about the incident. They may be asked the particular color of the car, the location
of car within the intersection, the clothing of a suspect, or even the physical attributes of the suspect. It is common for two people to witness the same event yet recall different details. They may perceive the event differently and they will also differ in susceptibility to suggestibility. Females and males tend to be more accurate on different types of details, and it appeared that females were more accurate and more resistant to suggestion about female-oriented details (Powers, Andriks, & Loftus, 1979).

Though there is a significant lack of information regarding the correlation between gender and MPI, the available research indicates that females may be more likely to be habitually susceptible to misinformation than males (Tomes & Katz, 1997). However, conflicting research suggests that females tend to respond more accurately than male witnesses to questions regarding the witnessed event (Lipton, 1977). Though there have been conflicting results in previous research, overall, the research suggests that misleading MPI does in fact impair the memories of the original event. Moreover, some researchers suggest that females not only remember more fine details of a particular event, they also remember more of the event as a whole as opposed to males.

The present study will attempt to add to the body of knowledge created by preceding researchers by examining the potential interaction between gender and MPI. It will assess the potential gender differences in eyewitness memory while incorporating misleading postevent information. This research will also provide a deeper understanding for those involved in determining the validity of eyewitness testimony and perhaps how better to ascertain information and correct the flawed aspects. Eyewitness testimony is imperative to the legal system in that it facilitates in the apprehension and conviction of individuals suspected of committing crimes.
against society. Additionally, if research can better identify the flaws of eyewitness memory, wrongful incarceration and accusations can begin to be thought of as issues of the past.

Method

Participants

The participants included undergraduate students from different majors recruited on the San José State University campus. Participants were from a convenience sample of 29 males and 29 females, between the ages of 18 and 42, for a total of 58 participants. Selected Professors provided a block of time in which this study was conducted. The participants were enrolled and were present in either an upper-division Psychology undergraduate course or a lower-division Justice Studies undergraduate course. The researchers did not group the participants in any particular manner pertinent to the study.

Materials

There was a background questionnaire as well as a set of questions pertaining to details of video clips viewed by the participants. The background questionnaire consisted of twelve questions (see Appendix A) in order to gather information about the participants. Two video clips served as the stimuli to stimulate witnessing an actual event. Both stimuli were clips from full-length motion films (e.g., The Rock and The Italian Job) that depicted intense action sequences. The clip from The Rock was 2 min 10 s in length and the clip from The Italian Job was 2 min 20 s in length. The questions for each video clip were on a two page questionnaire and were used to assess the memory of the events within the video and the associated details (see Appendixes B and C). The first page consisted of questions pertaining directly to the details of each video clip. The second page had enough space for the participants to give a brief summary of the details of each video clip. The questions contained a combination of both straightforward
questions of actual occurrences during the event and misleading questions created from false
details, the ratio of which was five misleading questions to six straightforward questions for a
total of 11 questions and one free response/summary for each clip.

Procedure

The researchers conducted the experiment in two classrooms in which the participants’
classes were usually held. Once the participants arrive, the researchers addressed all participants
together as a group. After being addressed, the participants read and signed a consent form and
answered questions on a background questionnaire. The participants watched one video, briefly
recounted the details of the events, answered questions about that video, and then repeated with a
second video and second set of questions.

Design and Analysis

The experiment was conducted using a 2x2 mixed design. Gender was a between-
subjects factor and Misleading Postevent Information was a within-subjects factor. Each factor
had two levels. Gender had either male or female and MPI had either with or without MPI. The
experiment consisted of four experimental conditions. The conditions consisted of males and
females with and without MPI. The researchers used an answer key (see Appendixes D and E) in
order to score correct and incorrect answers. Each participant had scores for four sections;
correct straightforward questions, correct free response details, incorrect misleading questions,
and incorrect misleading free response details. For each correct response to the straightforward
questions, one point was awarded; no points were awarded for incorrect responses to the
straightforward questions. One point was also awarded for each correct detail that is written in
the free response section. One point was awarded for each incorrect response to the misleading
questions as well as for each incorrect misleading detail within the free response.
Results

This study evaluated the effects of Gender and Misleading Postevent Information (MPI) on eyewitness memory.

Effects of Misleading Postevent Information

Participants answered more questions correctly without MPI (M = 8.53, SD = 1.70) than with MPI (M = 4.36, SD = 1.82). This effect was very statistically significant, $F(1,56) = 294.72$, $p < .0001$. When measuring memory through a summary, participants correctly included more details without MPI (M = 8.76, SD = 0.43) than with MPI (M = 7.03, SD = 3.57). This effect was also very statistically significant, $F(1,56) = 12.67$, $p < .001$.

Effects of Gender

Male participants correctly answered more questions (M = 6.98, SD = 1.60) than did the female participants (M = 5.92, SD = 1.77). This effect of Gender was very statistically significant, $F(1,56) = 8.34$, $p < .006$. Also, male participants included more details relevant to this study (M = 8.02, SD = 1.97) in the summary than did the female participants (M = 7.78, SD = 2.06). The effect of Gender on the summaries was not statistically significant, $F(1,56) < 1$.

Interaction of Gender and Misleading Postevent Information

The interaction of Gender and MPI was not significant in neither the question measure nor in the summary measure, $F(1,56) < 1$. The highest average for correctly answered questions was for the male participants without MPI (M = 8.93, SD = 1.62). The lowest average for correctly answered questions was for female participants with MPI (M = 3.69, SD = 1.83). Male and female participants tied with the highest average for the summary details with MPI (M = 8.76, SD = 0.44). The lowest average for the summary details was female participants without MPI (M = 6.79, SD = 3.68).
Discussion

This study investigated the effects of Misleading Postevent Information (MPI) and gender on long-term memory, more specifically on eyewitness memory. The effects of Gender and MPI have yet to be researched in one comprehensive study. Loftus and Hoffman (1989) developed the theory of MPI, which has been widely researched, though gender has not been a leading factor in the subsequent research. In the present study, participants watched two film clips and responded to questions with and without MPI, thus examining both the effects of gender and MPI on eyewitness memory.

The results of this study mirror those of previous studies in that though females generally remember finer details, males remember more spatial and logical aspects of the events without taking into consideration MPI (Loftus, Levidow, & Duensing, 1992). The present study measured Gender’s effect on eyewitness memory in two ways, first using a questionnaire and then using a summary. The male participants in this study correctly answered more questions than females overall, however, the summary for the current data failed to produce significant results. A reason for these findings could be that the questions were oriented towards gender (i.e., males-spatial features vs. females-finer details), whereas the summary may not have been gender sensitive. Also, perhaps the summary measure did not measure a great deal of what the research entailed. This study provides additional evidence that indicate males are more apt to remember details than females. The present study did not investigate the differences between the types of questions or the differences between the genders based on these types of questions.

The results of this study support the hypothesis that MPI not only impairs participants’ ability to remember event details, but that it also alters the actual memory of the original event (Lindsay, 1990; Loftus & Hoffman, 1989). As with the Gender conditions, the participants’
memory in the MPI conditions were also measured first using a questionnaire and then using a summary. Overall, the participants answered 65% of the questions correctly without MPI and 48% of the questions correctly with MPI. In the summary measure, 97% of the participants incorrectly identified MPI details. In other words, 97% of the participants included incorrect details that were presented in the questionnaire and therefore the participants’ memories of the event were altered due to the acquisition of details not previously witnessed.

A reason for the results of the present study could be attributed to the participants complete unawareness of the nature of the study, but also that the nature of memory creates the potential for the acquisition of new details and alteration of the memory for the original event. Furthermore, MPI had an overwhelming affect on the participants’ ability to remember event details as well as the alteration of the memory of the actual event, therefore supporting the findings previous research. Also, prior research used methods involving memory assessment tasks related to the memory of slides in a sequence (McCloskey & Zaragoza, 1985; Lindsay, 1990; Tversky & Tuchin, 1989) whereas the present study used motion films in a procedure similar to that Tomes and Katz (1997).

There is a lack of extensive research on the interaction of gender and MPI in studies of adult eyewitness memory. In the present study, there were no significant effects of the interaction of these factors. A reason for these results may be that either there was no interaction to measure between gender and MPI or the interaction simply did not exist. Previous research reinforces the notion that both Genders accurately remember different types of details, and that females were more accurate and more resistant to suggestion about female-oriented details (Powers, Andriks, & Loftus, 1979). Contrary to previous research however, Tomes & Katz, (1997) identified that
females are more likely to be susceptible to MPI than males. The findings of this study were not able to identify significant results to support either theory.

Research on eyewitness testimony has been ongoing for decades, as it will continue for many more. Future research may be directed towards exploring different forms of media to serve as stimuli. It is possible that the participants had already seen the films from which the clips were taken, and were therefore primed to the events in the film. Different results could occur with more realistic stimuli to simulate more “real-life” situations. Future researchers may also improve upon the summary measure by honing more specific instruction as to which details are required, which may in turn yield different results. Moreover, researchers could identify which specific questions are most commonly asked by law enforcement personnel while gathering information from the eyewitnesses. This may serve to give a more accurate representation and simulation of what may happen in the wake of an actual event.

Furthermore, though the present study can only be generalized to a very specific population, perhaps future research could diversify the participant sampling in order to produce results that could generalize to a more realistic, juror-eligible population. Also, to gain a deeper understanding of Gender and its effect on Eyewitness Memory, future researchers may want to formulate “gender-specific” questions (i.e., questions created to identify specific details to which each gender is supposedly sensitive; spatial questions for males and fine detail questions for females). Researchers could compare and contrast the participants’ responses to the “gender-specific” questions between the genders. Perhaps these gender-specific questions would produce different results.

For practical application, this study provides evidence that eyewitness memory is fickle and should be treated with caution when called upon as evidentiary support. It seems that this
type of testimony is not only hard to live with, but it is hard to live without. Though there is mounting evidence supporting the frequency of eyewitness error, this study opens up new research avenues for ways to improve the manner in which eyewitness testimony is processed within the legal system (Leippe, 1995).
References


Appendix A: Background Questionnaire

1. Current Age (in years): ____________________________________________

2. Gender (circle one):
   a. Female                b. Male

3. Major: ___________________________________________________________

4. Educational Institution in which you are currently enrolled:
   __________________________________________________________________

5. Class and time period in which this questionnaire is being answered:
   ___________________________________________________________________

6. GPA (Cumulative): ________________________________________________

Please circle one answer for each of the following questions

7. Do you wear corrective eyewear (i.e., glasses, contacts, etc.)?
   a. Yes                b. No

8. Have you ever witnessed a traumatic event?
   a. Yes                b. No

9. Have you ever been called upon to recall the details of this event?
   a. Yes                b. No

10. Do you feel that you accurately recalled the details of this event?
    a. Yes                b. No

11. Have you ever been called upon to testify/attest to the details of this event?
    a. Yes                b. No

12. Were you wearing corrective eyewear when you witnessed this event?
    a. Yes                b. No
Appendix B: Video Questionnaire - *The Italian Job*

1. How many cars were in the tunnel?
   
   5  3  2  0

2. How many motorcycles were in the tunnel?
   
   5  3  2  0

3. Which direction were the cars headed in the tunnel?

   North  South  East  West

4. How many shots did the passenger of the white car fire?
   
   10  7  3  0

5. What was the color of the car that made physical contact with the motorcycle?

   Red  White  Blue  None of these

6. What was the color of the car that exited the tunnel first?

   Red  White  Blue  None of these

7. What color was the suit of the person on the black motorcycle?

   Blue  White  Black  None of these

8. What color was the helicopter?

   Red  White  Black  None of these

9. What was the hair color of the female passenger in the red car?

   Blonde  Brown  Red  None of these

10. How many cars did the helicopter make physical contact with?

    3  2  1  0

11. How many other vehicles did the blue car make physical contact with?

    8  5  3  0
Appendix C: Video Questionnaire - The Rock

1. Which vehicle was being chased?
   - Black SUV
   - Red Pickup
   - Yellow Sportscar
   - White Convertible

2. Which direction was the black SUV travelling on California Ave.?
   - East
   - West
   - North
   - South

3. What was the approximate speed of the black SUV?
   - 25mph
   - 40mph
   - 70mph
   - 100mph

4. Who did the driver of the yellow sports car call?
   - Operator
   - Police
   - Accomplice
   - Neither

5. What words appeared on the tiedye VW bug?
   - World Love
   - Peace
   - Love not war
   - Peace for all

6. What type of vehicle does the black SUV make physical contact with first?
   - Bus
   - Trolley
   - Taxi Cab
   - Police Car

7. How many pedestrians tried to aid in the chase?
   - 5
   - 7
   - 3
   - 0

8. What color was the sweat suit of the suspect who stole the black SUV?
   - Grey
   - Black
   - White
   - Neither

9. How many times did the police cars make contact with the black SUV?
   - 10
   - 7
   - 3
   - 0

10. Which kind of car made contact with the red pickup?
    - Yellow Sportscar
    - Black SUV
    - Police Car
    - Neither

11. Which vehicle first made contact with the water truck?
    - Black SUV
    - Red Pickup
    - Yellow Sportscar
    - White Convertible
Appendix D: Answer Key - *The Italian Job*

1. How many cars were in the tunnel?
   \[5 \quad 3 \quad 2 \quad 0\]

2. How many motorcycles were in the tunnel?
   \[5 \quad 3 \quad 2 \quad 0\]

3. Which direction were the cars headed in the tunnel?
   North   South   **East**   West

4. *How many shots did the passenger of the white car fire?*
   \[10 \quad 7 \quad 3 \quad 0\]

5. What was the color of the car that made physical contact with the motorcycle?
   Red   **White**   Blue   None of these

6. What was the color of the car that exited the tunnel first?
   Red   White   **Blue**   None of these

7. *What color was the suit of the person on the black motorcycle?*
   Blue   White   Black   **None of these**

8. What color was the helicopter?
   Red   White   **Black**   None of these

9. *What was the hair color of the female passenger in the red car?*
   Blonde   Brown   Red   **None of these**

10. How many cars did the helicopter make physical contact with?
    \[3 \quad 2 \quad 1 \quad 0\]

11. *How many other vehicles did the blue car make physical contact with?*
    \[8 \quad 5 \quad 3 \quad 0\]

*Italicized = MPI Question*

**Bold/Underlined = Answer**
Appendix E: Answer Key - *The Rock*

1. Which vehicle was being chased?
   - **Black SUV**  Red Pickup  Yellow Sportscar  White Convertible

2. Which direction was the black SUV travelling on California Ave.?
   - East  **West**  North  South

3. What was the approximate speed of the black SUV?
   - 25mph  40mph  **70mph**  100mph

4. *Who did the driver of the yellow sports car call?*
   - Operator  Police  Accomplice  **Neither**

5. What words appeared on the tiedye VW bug?
   - World Love  Peace  **Love not war**  Peace for all

6. What type of vehicle does the black SUV make physical contact with first?
   - Bus  Trolley  **Taxi Cab**  Police Car

7. *How many pedestrians tried to aid in the chase?*
   - 5  7  3  **0**

8. *What color was the sweat suit of the suspect who stole the black SUV?*
   - Grey  Black  White  **Neither**

9. *How many times did the police cars make contact with the black SUV?*
   - 10  7  3  **0**

10. *Which kind of car made contact with the red pickup?*
    - Yellowsports car  Black SUV  Police Car  **Neither**

11. Which vehicle first made contact with the water truck?
    - **Black SUV**  Red Pickup  Yellow Sportscar  White Convertible

*Italicized = MPI Question*

*Bold/Underlined = Answer*