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A STUDY ON RECONSTRUCTIVE MEMORY AMONG MALES AND FEMALES

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Abstract

People remember information by actively reconstructing it and sometimes also interjecting new information in the process. Reconstruction occurs in case of remembering pictures, stories, and also in eye witness reports.

Sir Fredrick Bartlett (1932) proposed that retrieval is a reconstructive process. Bartlett studied how British adults recalled "The war of the ghosts" a folktale of North American Indians that contained mystical elements. He observed that the subjects often erred by omitting details and by making the story more consistent with their cultural expectations. He argued that the subjects were not simply storing copies of what they had read. Rather, they were using their general knowledge and their expectations, combined with a few fragmenting details.

The following experiment was conducted to study the effect of reconstruction on retrieval of information stored in memory in an individual and also in order to compare reconstructive memory of males & females. For this purpose, a verbal memory test was used, consisting of two parts. The study was conducted on a sample of 20 consisting of 10 males & 10 females each, their age ranging from 16 - 30 using the Memory Reconstruction Inventory. The results showed that the effect of reconstruction on the retrieval of previously learnt material has taken place in the participants.

***Keywords** – Reconstructive Memory, Confabulation, Schemas, Eyewitness Testimony, Serial Reproduction.*

INTRODUCTION

Memory is never a literal recount of past experiences. Rather, it is dependent on the constructive processes present at the time of encoding that are subject to potential errors and distortions. Essentially, the constructive memory process functions by encoding the patterns of physical characteristics that are perceived by the individual, as well as the interpretive conceptual and semantic functions that act in response to the incoming information. By utilizing multiple interdependent cognitive processes there is never a single location in the brain where a given complete memory trace of an experience is stored. In this manner, the various features of the experience must be joined together to form a coherent representation of the episode and if this binding process fails it can result in source memory failure, where later attempted retrieval of the episode results in fragmented recollection and an inability to consolidate the information into a cohesive narrative of a past experience. During the recall of Episodic memory, the information that a person remembers is usually limited in scope,

ultimately giving an incomplete recollection of an event. By employing reconstructive processes, individuals supplement other aspects of available personal knowledge into the gaps found in episodic memory in order to provide a fuller and more coherent version, albeit one that is often distorted.

Many errors can occur when attempting to retrieve a specific episode. First, the retrieval cues used to initiate the search for a specific episode may be too similar to other experiential memories and the retrieval process may fail if the individual is unable to form a specific description of the unique characteristics of the given memory they would like to retrieve. When there is little available distinctive information for a given episode there will be more overlap across multiple episodes, leading the individual to recall only the general similarities common to these memories. Ultimately proper recall for a desired target memory fails due to the interference of non-target memories that are activated because of their similarity.

Secondly, a large number of errors that occur during memory reconstruction are caused by faults in the criterion-setting and decision-making processes used to direct attention towards retrieving a specific target memory. When there are lapses in recall of aspects of an episodic memory, the individual tends to supplement other aspects of knowledge that are unrelated to the actual episode in order to form a more cohesive and well-rounded reconstruction of the memory, regardless of whether or not the individual is aware of such supplemental processing. This process is known as confabulation. All of the supplemental processes occurring during the course of reconstruction rely on the use of schema, information networks that organize and store abstract knowledge in the brain.

Eyewitness Testimony
The "paradox of eyewitness testimony" is that although EWT is regarded by professionals as having a low level of reliability, it is the most important form of testimony as far as jurors are concerned.

Loftus (1987) has conducted many studies to try and understand the reliability of memory in the context of EWT. In one study Participant's were shown film of a traffic accident, and then asked questions about it. One question was "how fast were the cars going."; half of the Participant's were asked "..when they hit each other", and the other half "..when they smashed into each other". Subsequently, when asked to estimate the speed of collision, the "smashed" group estimated a higher speed than the "hit" group. Additionally, when asked whether there had been any broken glass in the film (there hadn't), the "smashed" group were more likely to "remember" having seen glass.

This suggests that the schema being used to reconstruct a memory is influenced by the way questions were put; Participant's in the "smashed" group were *confabulating*; that is they honestly believed that they'd seen broken glass.

Nolan & Markham (1998) showed that *confident* witnesses are more likely to be seen as credible, and so an important implication of Loftus' research is that questioning of eyewitnesses

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must take account of the consequence of "leading" questions. However, Loftus' experiments could be criticised on the grounds of lack of mundane realism. Following on from this, Geiselman (1985) devised a technique called the *cognitive interview* and found that police officers using this technique obtained more correct answers than was the case with previous techniques.

The Jennifer Thompson & Ronald Cotton Case (1984)

Even though memory and the process of reconstruction can be fragile, police officers, prosecutors, and the courts often rely on eyewitness identification and testimony in the prosecution of criminals. However, faulty eyewitness identification and testimony can lead to wrongful convictions.

How does this happen? In 1984, Jennifer Thompson, then a 22-year-old college student in North Carolina, was brutally raped at knifepoint. As she was being raped, she tried to memorize every detail of her rapist's face and physical characteristics, vowing that if she survived, she would help get him convicted. After the police were contacted, a composite sketch was made of the suspect, and Jennifer was shown six photos. She chose two, one of which was of Ronald Cotton. After looking at the photos for 4–5 minutes, she said, "Yeah. This is the one," and then she added, "I think this is the guy." When questioned about this by the detective who asked, "You're sure? Positive?" She said that it was him. Then she asked the detective if she did OK, and he reinforced her choice by telling her she did great. These kinds of unintended cues and suggestions by police officers can lead witnesses to identify the wrong suspect. The district attorney was concerned about her lack of certainty the first time, so she viewed a lineup of seven men. She said she was trying to decide between numbers 4 and 5, finally deciding that Cotton, number 5, "Looks most like him." He was 22 years old.

By the time the trial began, Jennifer Thompson had absolutely no doubt that she was raped by Ronald Cotton. She testified at the court hearing, and her testimony was compelling enough that it helped convict him. How did she go from, "I think it's the guy" and it "Looks most like him," to such certainty? Gary Wells and Deah Quinlivan (2009) assert it's suggestive police identification procedures, such as stacking lineups to make the defendant stand out, telling the witness which person to identify, and confirming witnesses choices by telling them "Good choice," or "You picked the guy."

After Cotton was convicted of the rape, he was sent to prison for life plus 50 years. After 4 years in prison, he was able to get a new trial. Jennifer Thompson once again testified against him. This time Ronald Cotton was given two life sentences. After serving 11 years in prison, DNA evidence finally demonstrated that Ronald Cotton did not commit the rape, was innocent, and had served over a decade in prison for a crime he did not commit.

Ronald Cotton's story, unfortunately, is not unique. There are also people who were convicted and placed on death row, who were later exonerated. The Innocence Project is a non-profit

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group that works to exonerate falsely convicted people, including those convicted by eyewitness testimony.

The Elizabeth Smart Case (2002)

Contrast the Cotton case with what happened in the Elizabeth Smart case. When Elizabeth was 14 years old and fast asleep in her bed at home, she was abducted & raped multiple times at knifepoint. Her nine-year-old sister, Mary Katherine, was sleeping in the same bed and watched, terrified, as her beloved older sister was abducted. Mary Katherine was the sole eyewitness to this crime and was very fearful. In the coming weeks, the Salt Lake City police and the FBI proceeded with caution with Mary Katherine. They did not want to implant any false memories or mislead her in any way. They did not show her police line-ups or push her to do a composite sketch of the abductor. They knew if they corrupted her memory, Elizabeth might never be found. For several months, there was little or no progress on the case. Then, about 4 months after the kidnapping, Mary Katherine first recalled that she had heard the abductor's voice prior to that night (he had worked one time as a handyman at the family's home) and then she was able to name the person whose voice it was. The family contacted the press and others recognized him—after a total of nine months, the suspect was caught and Elizabeth Smart was returned to her family.

Reconstructive memory is a theory of memory recall, in which the act of remembering is influenced by various other cognitive processes including perception, imagination, semantic memory and beliefs, amongst others. People view their memories as being a coherent and truthful account of episodic memory and believe that their perspective is free from error during recall. However, the reconstructive process of memory recall is subject to distortion by other intervening cognitive functions such as individual perceptions, social influences, and world knowledge, all of which can lead to errors during reconstruction.

REVIEW OF LITERATURE

Related studies help in acquiring information about the studies done in the field. The knowledge of related literature enables us to know the means of getting to the frontier in the field of our problems until we have learnt what others have done in our area, we cannot develop a research project that will contribute to furthering knowledge in this field.

1) ***Allport & Postman (1947)*** showed participants a drawing of an argument on a subway train. They were asked to describe it to another participant through serial reproduction (like Chinese Whispers). The black character was better dressed and more respectable than the white character but, after serial reproduction, white participants tended to reverse their appearances. Some even described the black character as holding a knife.

2) ***Loftus et al. (1987)*** showed participants a series of slides of a customer in a restaurant. In one version the customer was holding a gun, in the other the same

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customer held a checkbook. Participants who saw the gun version tended to focus on the gun. As a result they were less likely to identify the customer in an identity parade those who had seen the checkbook version.

3) *Lost in the Mall (Loftus and Pickrell, 1995)*

In this study, Jacqui Pickrell and Elizabeth Loftus used 24 participants who were lead to believe they were taking memory tests. They asked family members to provide details of three stories from when the participants were 4 – 6 years old. They also asked about details that could be plausibly added to a fictional story – being lost in the mall. So, for instance, the family members might give details like the name of the mall, or when they might have been shopping there. The family members also validated that the participant was never actually lost in the mall as a child. The participants read the descriptions of the four events that had been prepared by the researchers with the help of descriptions from the family members. The participants were interviewed soon after they read the descriptions of the events and then again in one week. The results showed that 5/24 (i.e. 21%) of the participants recalled being lost in the mall, sometimes in great detail. They did, however, rate the memories as being less clear than the others.

4) *Garry, Manning and Loftus in (1996)* conducted a research to understand the features of false memory. Initially they presented before the participants of their experiments, a list of events that could have occurred in their lives. In the first phase of this experiment, they rated the likelihood that each of these events actually took place in their lives to the best of their childhood memories. Two weeks later, they were invited again to the laboratory and were asked to imagine those events and visualise as if they actually happened to them. In particular, events which were rated low in terms of their likelihood of occurrence, were chosen for the task of visualising and imagining. This was the second phase of the experiment. Finally, in the third phase, the experimenters pretended that they had misplaced the event likelihood ratings which they had obtained during the first phase and therefore requested the participants to respond to the list, once again. Interestingly, events which were rated low on likelihood in the first phase but were later visualised and imagined as real were now rated high. The participants reported that those events actually took place in their lives. These findings suggest that memory can be induced and implanted through imagination inflation — a finding that provides useful insights into memory processes.

5) *False memories of committing a crime (Shaw and Porter, 2015)*

The aim of this study was to see if it was possible in a laboratory setting for researchers to implant a false memory of committing a crime. The researchers gathered 70 Canadian college students who were randomly assigned to either the "criminal condition" or the "non-criminal condition." They were interviewed three times over three weeks. In each interview, the participants were asked to describe two events: a

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true event (details were provided by a family member) and a fictional account of committing a crime when they were about 10-14 years old (the participants were led to believe the details of this had also been given by their family member). The crimes were either theft, assault, or assault with a weapon. To encourage the production of false memories, the researchers encouraged the participants to practice visualization techniques at night and they also used subtle social pressure by saying most people can remember these kinds of things if they try hard enough. By the third interview, 21/30 (70%) of the participants in the criminal condition had a false memory of committing the crime, some even giving specific details of their contact with the police at the time. This study provides evidence for the fact that how people are questioned can lead to false memories.

METHODOLOGY OF STUDY

Using quantitative approach, an attempt has been made to study the reconstructive memory of males & females. The study seeks to gain insight into the memory reconstruction of both the genders. For this purpose, a verbal memory test was used, consisting of two parts. The researcher took 20 participants in which 10 are male & 10 are female. The researcher chose this experiment for conduction in order to determine the gender difference in memory reconstruction among randomly selected males & females with their age ranging from 16 – 30.

Research Design

The present study was conducted on Exploratory Research Design.

AIM

To study and determine the difference in effects of reconstruction on retrieval of stored information in memory between males & females.

OBJECTIVE

- To understand the difference in effects of reconstruction on retrieval of stored information in memory between males & females.

- To overview the retrieval cues in males & females with the help of the verbal memory test.

HYPOTHESIS

- Reconstructive memory will be high in female participants .

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- Retrieval cues result in reconstruction of the previously learnt material.

SAMPLE

For the present study, the researcher has approached males and females of different age groups ranging from 16 - 30 & belonging to different backgrounds. The sample size is 20, which comprises of 10 males & 10 females. The sample was randomly selected.

DATA COLLECTION

Data collection was done through Psychometric test administration on one – on – one basis.

TOOLS USED

A verbal memory test consisting of two parts & a pencil.

VARIABLES

Independent variable : The verbal memory test consisting of two parts

Dependent variable : Reconstructive retrieval

DESCRIPTION OF THE TOOL

The memory test consists of two parts. The first part consists of 24 sentences, each followed by a related question. The second part consists of 30 sentences each followed by two response options, "old" and "new".

PROCEDURE

For the present study the sample of 20 out of which 10 males and 10 females were taken. The memory reconstruction test was administered individually on each participant. Each participant was asked by the investigator to write their personal details first i.e (name, age, gender, educational qualification).

Each participant was asked to sit comfortably and rapport was established. The first part of the test was presented to the participant and the following instructions were given:

"Look at the sheet in front of you. There are some sentences given, followed by a question each. Read each sentence, count to five (5) and then answer the question following it. Repeat the same for all the sentences. Do it as fast as you can."

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After the subject completed, it was taken back. Then after a short time gap, second part of the test was presented to subject and the following instructions were given:

"There are some sentences given followed by two response options 'OLD' and 'NEW'. Decide whether each sentence is old or new. Put a tick against the response option chosen. Do it as fast as you can."

After this, the sheet was taken back by the investigator. Then, the number of the sentences judged 'old' were counted by the investigator.

RESULTS

The data was analyzed by calculating the mean value of both the old & new responses of both male & female participants and then calculating it's standard deviation.

DISCUSSION

In the memory reconstruction experiment the responses given by the male participants for part one (1) and part two (2) are tabulated in Table one (1).

Table One (1) Shows The Group Data Of The Test For Male Participants.

No. of Participants	No. of Old Responses	No. of New Responses
1	19	11
2	11	19
3	23	7
4	22	8
5	6	24
6	0	30

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7	19	11
8	11	19
9	15	15
10	16	14
Total	142	158
Mean	14.2	15.8

The responses given by female participants for part one (1) and part two (2) are tabulated in Table two (2).

Table Two (2) Shows The Group Data Of The Test For Female Participants.

No. of Participants	*No. of Old Responses*	*No. of New Responses*
1	22	8
2	20	10
3	17	12
4	24	6
5	16	14
6	20	10
7	13	17
8	14	16
9	16	14
10	12	18
Total	174	125
Mean	17.4	12.5

Standard Deviation For Table One (1) And Table Two (2) Only For Old Responses

Standard Deviation for Male Participants	*Standard Deviation for Female Participants*
6.91	3.79

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**Bar Representation Of Mean Value of Old & New Responses of Male & Female Participants.**
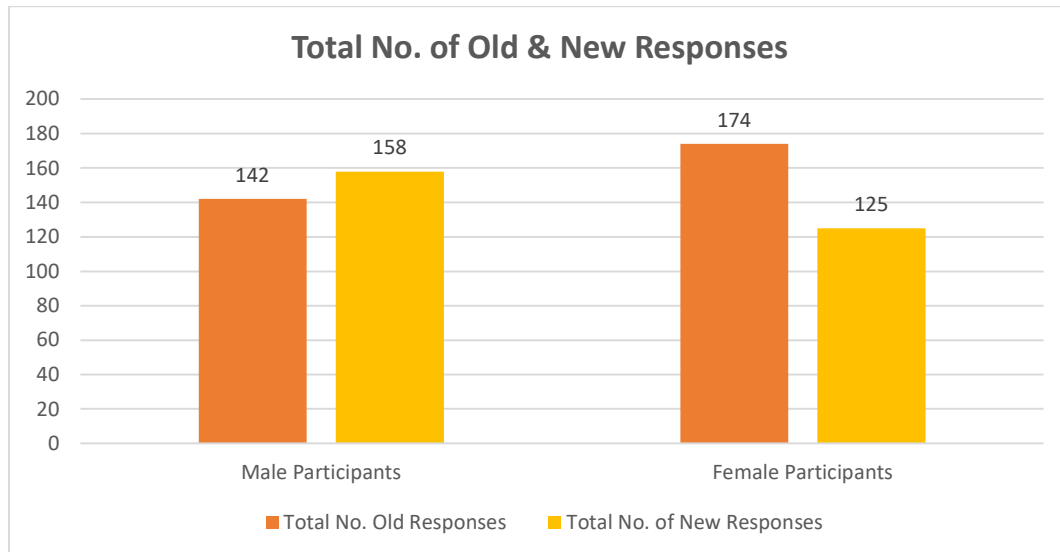
The total no. of old & new responses of male participants is 142 & 158 respectively. The total no. of old & new responses of female participants is 174 & 125 respectively.

Bar Representation of Total No. of Old & New Responses of Male & Female Participants
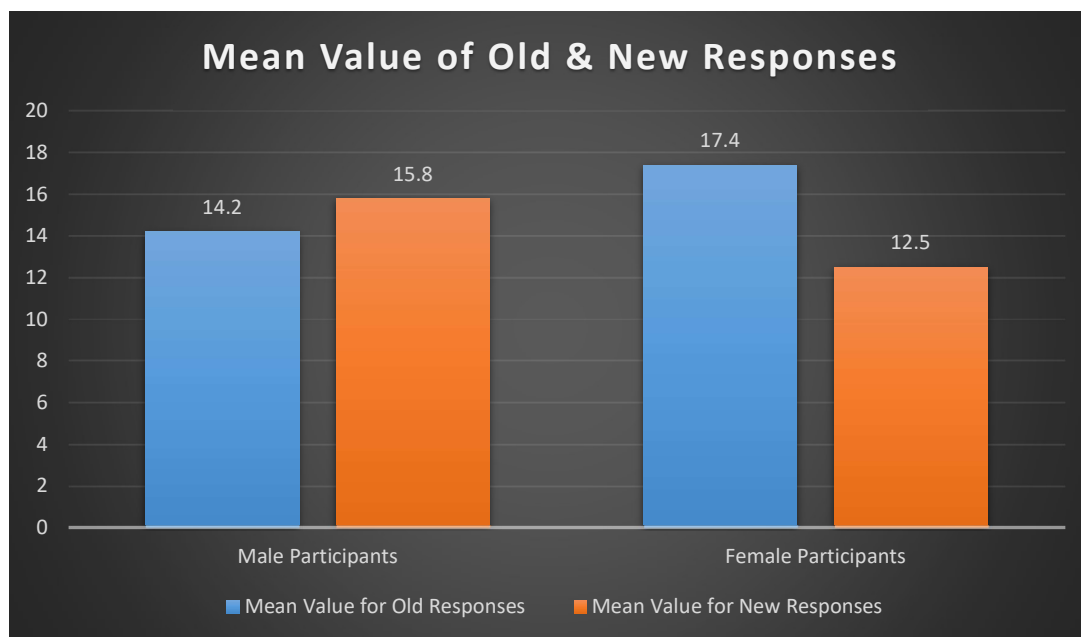
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The <u>total mean</u> for old & new responses of <u>male participants</u> is 14.2 & 15.8 respectively. The <u>total mean</u> for old & new responses of <u>female participants</u> is 17.4 & 12.5 respectively.

Bar Representation Of Standard Deviation of Male & Female Participants

STANDARD DEVIATION FOR MALE & FEMALE PARTICIPANTS

■ Standard Deviation for Male & Female Participants

6.91

3.79

MALE PARTICIAPNTS   FEMALE PARTICIPANTS
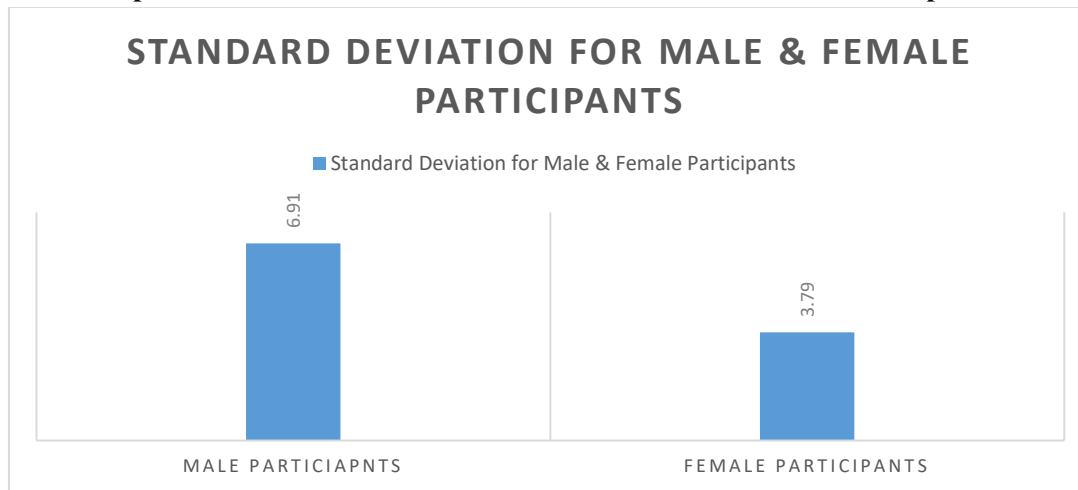
The Standard Deviation of <u>male participants</u> is 6.91 and the standard deviation of <u>female participants</u> is 3.79.

In Table one (1) the data of male participants shows that the 10 participants compared and responded a total of 142 number of old statements from part one (1) to part two (2) and a total of 158 number of new statements in part two (2). Whereas, in table two (2) the data of female participants shows that the 10 participants compared and responded a total of 174 number of old statements from part one (1) to part two (2) and a total of 125 number of new statements in part two (2).

It can also be observed from the data analysis and results that the Mean for old responses of male participants has been found to be 14.2 and the mean for new responses to be 15.8. The Mean for old responses of female participants has been found to be 17.4 and the mean for new responses to be 12.5. Also, the standard deviation of male participants has been found to be 6.91 & the standard deviation of female participants has been found to be 3.79. From this, we can clearly see that the reconstructive memory is higher in female participants than male participants as the Mean for old responses of female participants has been found to be 17.4 which is significantly higher than 14.2, the mean for old responses of male participants. This indicates that memory reconstruction has occurred but more in female participants as none of these statements in part one (1) were same in part two (2). Thus, accepting the hypothesis, memory reconstruction has occurred.

CONCLUSION

The Hypothesis that retrieval cues result in reconstruction of the previously learnt material and also that the Reconstructive memory will be higher in female participants has been proven.

PRACTICAL APPLICATION

Knowledge of this is useful in case of eye – witness reports in legal settings.

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