**Exploring False Memory in Memory Recognition**

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**Abstract**

This experiment uses a between-subject design where one group simply listens to the list of words whereas the second group has to write down a number between 1 and 20 to a beat while also listening to the list. The purpose of this experiment was to determine whether paying full attention has any effect on false recognition. Participants were given 4 10-word lists plus 2 non-presented lure words read at 1 word every 2 seconds. During the recognition phase, 24 items were presented which included 8 ‘old’ words and 8 ‘new’ words. These new words were not presented at encoding and not semantically related. The old words were simply words that were present at encoding. The independent variable in this study is the attention of participants while the dependent variable is the number of lists falsely recognized. This experiment therefore seeks to determine whether paying full attention in a situation lessens the chance of false memories being formed. This experiment follows from Knott & Dewhurst, 2007 where they concluded that false responses were reduced by divided attention at encoding and increased by divided attention at retrieval. Our experiment concluded that there was not a significant difference between attention and false memory. Our results did not replicate the findings of the original study and may be explained by multiple confounding variables.

**Introduction**

The science of false memory began in the 1970s by Elizabeth Loftus where she identified a phenomenon known as the misinformation effect. This is the phenomenon where a person distorts facts about an event they witnessed if given new information. In other words, even though people have first hand experience of an event, the memory of it is still subject to distortion. This is a potentially dangerous phenomenon in the modern world particularly in the justice system. As much as 68% of the wrongful conviction cases are due to faulty eyewitness testimonies and misidentification (Toglia et. al., 2021). This is not simply due to someone lying about who the perpetrator is, rather it is a complex issue that needs to be addressed. Firstly, police lineups are primarily used for recognition of a suspect. It is also not uncommon for an eyewitness to be questioned by the police or others about an event prior to the lineup of suspects. The fact memory is reconstructive in nature already points to a flaw in the system. The more times a memory is recalled, the more it is likely to be interfered with. In addition, leading questions by the police such as “what color was his beard?” offer the witness characteristics about suspect that they do not necessarily remember. The lends itself to the misinformation effect whereby the witness can now have an entirely new image of the suspect as opposed to before questioning etc. In addition, dividing attention at the time of encoding results in the inability to properly encode all information present. The brain therefore would rely on heuristics to draw assumptions from the sporadic information it received during encoding. Therefore, it is the hypothesis of this experiment that divided attention would result in an increase in false recognition.

**Method**

**Participants**

The participants of this study consisted of 92 students all enrolled in PSY270. This is a second year course on cognitive psychology in the University of Toronto. Out of 92 students, 65 were female, 24 were male and 2 identified as ‘other’. The average age of a participant was 20.5 years old with a standard deviation of 3.8 years. The average participant was in their second year of undergraduate study with a standard deviation of 0.78.

**Design and Procedure**

Participants were split according to their seating in the classroom. Half of the room were told to simply listen to the list of words that would be read to them. The other half were tasked with not just listening to the words but also to write down a number between 1 and 20 to a beat. 4 10-word lists were presented during this phase including 2 non-presented critical lures. Both groups heard the words at the same time after which the recognition task began. During recognition, both groups were asked to log onto Tophat, software used in the classroom, to indicate whether the recognized items presented. There were 24 items presented during the recognition phase which also included words that were not presented during the previous phase. These new items were also not semantically related to words presented before. The recognition phase included all critical lures (8 words), 2 old words from each list and 8 non-presented, non-related words. Using TopHat, participants were asked to indicate whether or not they remember seeing a word on the given lists.

**Results**

Firstly, a one-sample t-test was used to establish whether there was a presence of false memory for both groups. The mean of the combined groups were compared to what we would expect due to chance. The observed mean was 4.02 out of 8 critical lures. The calculated p-value was much less than the cut-off value of 0.05. From the t-test, we can conclude that the observed mean is statistically significantly greater than zero, so we can conclude that false memory is present. Secondly, independent samples t-tests were used to determine the effect of attention of false and correct recognition. These tests answer the question ‘Does the amount of attention affect false memory”? Those who paid full attention recognized 6.4 our of 8 words whereas those with divided attention recognized 4.8 out of 8 words. The t-test showed that this difference is significant. For false recognition, those who paid full attention falsely recognized 3.7 out of 8 while those who paid divided attention falsely recognized 4.3 out of 8. The p-value for the difference in the means of false recognition was >0.05 which indicated that the difference is not statistically significant. In other words, we did not have a difference between attention and false memory which did not replicate the original study.

**Discussion**

The findings of this experiment did not replicate previous experiments nor did it converge on the hypothesis of this paper. The results showed there is no effect on false memory if you were paying full or divided attention. There may be several confounding variables that accounted for this finding. Firstly, this experiment did not take place in a controlled environment. Students had to ability to cheat etc. In addition, the demographics of the students can also skew the results. Students in this experiment are those who are in psychology related fields of study and are more likely to be observant in memory tasks. In addition, being a student at UofT also places the sample in the higher ends of the IQ distribution. High-IQ patients had less false recognition (Loftus et. al., 2018). To account for these variables, the experiment needs to take place in a controlled environment as well as diversify the sample. Perhaps taking participants from other majors etc., may be beneficial. Future research should focus more on the implications of false memories in the world at large rather than in a classroom. In particular, there are still archaic policing practices, especially in the third world, that do not take into account the misinformation effect. This disconnect between the science of memory and the beliefs held by those involved in judicial processes can lead to fundamental miscarriages of justice (Knott et. al., 2015). Future research etc., of this topic needs to involve making this information as widely available to the public as possible. In addition, amendments to current policing and judicial practices should be incorporated accordingly.

However, as far as this experiment is concerned, there is no effect on false memory by paying full or divided attention.

**References**

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