

IB PSYCHOLOGY HL

INTERNAL ASSESSMENT

Title: Reconstruction of memory: An experiment on eyewitness testimony and interaction between language and memory.

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Date: **May, 2021**

Word count: **2,009**

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Introduction

Memory is the ability to take in information, store it, and recall it at a later time. Memory is involved in processing vast amounts of information. This information takes many different forms, e.g. images, sounds or meaning. But how reliable can our memory be at all times. Scientists have found that prompting an eyewitness to remember more can generate false details although that feels just as correct to the witness in their actual memories. Human memory can be notoriously unreliable, and especially when it comes to details. Studies like (Bartlett, 1932) also demonstrate how memories is not totally accurate record of our experiences, though we would like to think so. Bartlett's study aimed to examine how the memory of a story is affected by prior knowledge. He wanted to study whether people's cultural backgrounds would drive to distortion of memory while recalling the information. People left out details and filled in with gaps or simplified detail. According to Bartlett, memory is an imaginative reconstruction of past experience of the person's life while the person reconstructs it by trying to fit into present existing schemas.

A study was done by *Loftus and Palmer (1974)* named "Automobile Reconstruction" stated that memory could be altered by just changing a verb in the question.

The main focus was to see the influence of misleading information in terms of both visual imagery and phrasing of questions with eyewitness testimony. Loftus' findings appear to show that memory for an event that has been witnessed is hugely flexible. If one is exhibited to new knowledge during the period between seeing the event and recalling it, this further information may have marked effects on what they remember. The first memory can be modified, changed, or supplemented.

The experiment was a partial replication of Loftus and Palmer's (1974) study. An opportunity sample of 16 participants (N=16) participated. Participants were divided into groups and were informed about their rights in the study. Each group had different verbs in question, along with some other questions. In the follow-up session after a week, participants were tested if they remember other details that were not true.

The finding of the experiment showed that the estimated speed was affected by the verb used. The verb implied information about the speed, which systematically affected the participant's memory of the accident. The conclusion of the research suggested that memory is easily distorted by questioning technique, and information acquired after the event can merge with original memory causing inaccurate recall or reconstructive memory i.e. the answer was influenced by the existing knowledge in schemas.

Aim: To test the hypothesis that the word used in eyewitness testimony and the verbs in the question can change the memory of the eyewitness and so have a confabulating result, as the report would become distorted by leads provided in the question.

The research hypothesis is the changed verb that will result in a change in speed estimate. The more robust the verb, the higher will be the speed estimate.

The null hypothesis is that there will be no impact of manipulating the independent variable and that if any observed difference will be the result of chance.

The experiment used in the sample design, the *Independent variable (IV)*, is the wording (verb) of the question; and the *Dependent variable (DV)* is the speed reported by the participants. All of the participants were divided into groups, and each group was given a question with a different verb in it that would test the change the memory of the eyewitness.

Exploration

Experimental Designs

Repeated Measures design is used in our experiment, it is an experimental design where the same participants take part in each condition and level of the experiment. Which means in each condition we used the same group of participants in each condition of the experiment.

Sampling Technique

The participants were found by “*opportunity sampling*” and were divided into four groups and were informed of their rights in the study. A consent form was sent to all and gathered.

Choice of Participants

The target population was students studying, who had never studied either Psychology. The target population was IBDP students with fluency in English. A total number of 16 participants were used, of which 11 were male, and 5 were female. The age range was between 16 and 17 years old. Participants were randomly divided into groups and were informed about their rights in the study. The participants were found by “*opportunity sampling*,” as this was the most convenient method. The different groups were asked the question, “About how fast were the cars going when they (smashed/collided/bumped/ hit) each other?” Each group had a different verb in the question to test the effect of misleading questions.

Control Variable

- Only Participants who had good access to internet chosen.
- Briefing and Debriefing Instructions was standardised and were read in same way for all.
- Duration of the experiment and the sample volume

Choice of Materials

- Informed Consent Form (signed by participants before conducting the experiment).
- Standardised Briefing and Debriefing Note.
- Electronic Device to host meetings (Google meet) and to collect data.
- Video of Car crash taken from the internet.
- Various Questionnaire (Google forms).

Procedure

- The participants were made comfortable first and then an online meeting was conducted on Google meet and was briefed on the experiment, Then groups were then shown a video of MVA's (Moving vehicle accidents).
- They were then sent questionnaires which had four questions, along with the main question to test the speed of the vehicles. The participants had to answer the question, “About how fast were the cars going when they (smashed/collided/bumped/hit) each other?” Later the sample groups were debriefed for the day and were then informed about a follow-up procedure which would take place after seven days.
- The sampled groups were invited again after seven days and were briefed for the next stage of the study. This time the groups were not shown any video of MVA's. They were then sent questionnaires. The forms had constant questions, along with the change in the main question. To check the falsification of memory over time, they were asked to answer “Did you see any broken glass?” After the submission of the forms, the groups were then finally debriefed about the whole study. The data were again analysed from the answers taken from the google forms.

Analysis

Descriptive Statistics

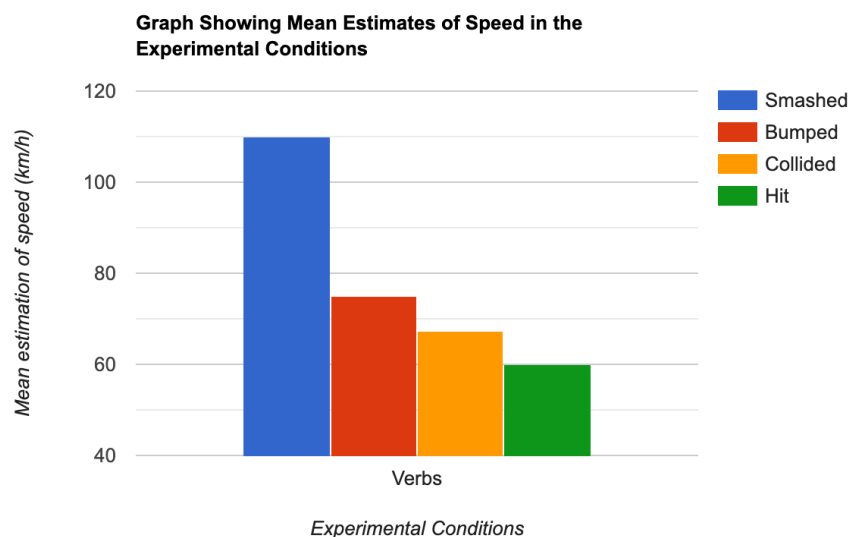
The questionnaires were classified into four groups depending on their experimental condition (leading verbs). To provide a more vibrant interpretation of the data collected by replicating the experiment, we not only collected the speed depending on the intensity of the verb but also conducted a post week session to see if schema can alter the memory, we asked the question of broken glass to the post-week and collected the data for that too.

Under *Descriptive Statistics*, in condition 1 (Smashed), the speed estimation varied between 60 km/hrs and 150 km/ hrs, adding 440km/hrs. In contrast, the range in other conditions was significantly lower – the speed estimation In condition 2 (bumped), the speed estimation varied between 60 km/hrs and 90 km/hrs, adding 300km/hrs. In condition 3 (Collided), the speed estimation varied between 60 km/hrs and 80 km/hrs, adding 270km/hrs. In the last condition 4 (Hit), the speed estimation varied between 30 km/hrs and 100 km/hrs, adding 240km/hrs. The mean scores describe the average estimation of speed by the participants, whereas standard deviation describes the numerical measure of the spread of data. The data is given below in Table 1.

TABLE 1: Speed estimated by the participants of the Experiment according to their verb

LEADING VERBS	SPEED (km/hrs)				TOTAL
Smashed	60	80	150	150	440 km/hrs
Bumped	70	60	80	90	300 km/hrs
Collided	60	80	60	70	270 km/hrs
Hit	80	100	30	30	240 km/hrs

LEADING VERBS	MEAN ($\bar{x}$)	STANDARD DIVIATION
Smashed	110	46.9
Bumped	75	12.9
Collided	67.5	9.5
Hit	60	35.5



The original study stated that memory is easily distorted by questioning techniques like leading verbs and information acquired after the event can merge with original memory causing inaccurate recall or reconstructive memory. Our results showed that nearly 40 percent of participants answered yes, which is almost half of the population. There was no broken glass, but almost half of the participants assumed there was broken glass due to the schema. The data is given below in Table 2.

TABLE 2: Post week session answer to see confabulating results.

DID YOU SEE ANY BROKEN GLASS?	YES	NO
TOTAL	6	10

Inferential Statistics

When processing the data, the statistical test used to analyse the data for this investigation was Wilcoxon signed-rank test. This is a non-parametric statistical hypothesis test used to compare two related samples, matched samples, or repeated measurements on a single sample to assess whether their population mean ranks differ. Thus concluding that changing the verb (critical word) in the leading question affects recall of the event when giving estimations of speed. Our hypothesis was accepted.

Evaluation

As per the results of our experiment, they are entirely into account with Loftus and Palmer's original study, i.e., it implies that the meanings of a verb in the question (schema) can change the response returned by the participant. After the participants were introduced to a misleading question, they behaved as expectedly. As per the results, the mean estimated speed denoted significantly higher during the word with dramatic meanings, "smashed," was used than while that less dramatic word "collided" was the verb, which implies that individuals process knowledge-based on their existing knowledge, i.e., schemas. The influence of language(words) on memory is highly connected in eyewitness testimonies as it can lead to the erroneous recalling of seen events. This theory was distinctly illustrated in our experiment and the original study carried by Loftus and Palmer. The hypothesis was accurate. Viewing at the results above, we can determine that the estimated speeds given vary as the verb in the question changes, validating the leading verb's hypothesis.

After a week, when the dependent variable was measured, and the question of broken glass was asked, "Did you see any broken glass? Yes or no?" When there was no broken glass on the original video. The results show that majority of participants report not seeing broken glass. This study initially suggests that memory is simply distorted by questioning technique, and information collected can merge with original memory causing incorrect recall or reconstruction of memory. The study suggests that this result is not only due to a response-bias because leading questions indeed altered the memory a participant had for the event.

Repeated measures design was used in our experiment, which means in each condition we used the same group of participants in each condition of the experiment.

Our research's main *Strength* is the capability to control the experimental variables since all interfering variables are avoided to most possibilities in a closed experimental condition. The independent variable (verb) was clearly manipulated and produced differing dependent variables in the experiment.

However, some *limitation* could not be well controlled because of the nature of our sample. The *convenience sample* indeed resulted in some kind of sample bias since there was a lack of reach towards the participants. Plus, some individuals insisted on chatting with each other during the conduction of the experiment as also it was conducted online, so there was not much that could have been done. Thus *alterations* might be there as a result of conformity. Another *limitation* was that the experiment is conducted in a simulated environment. In actual life, the individuals would observe the situation more dramatically and might hold some engagement in the case or the characters involved, making them pay more attention to the situation. Therefore it is hard to postulate these conclusions to real life.

For *future moderations and studies*, a more representative sample group could be used, i.e., the sample individuals should portray the population as a whole and not only the IB students or a restricted people type. Secondly, To avoid undesired interaction between participants at the time of the experiment, they could be placed in separate rooms or different times could be considered.

The *conclusion* is that this experiment supports the theory of false memory and misleading questions, also supports the claim that memory is an unreliable form of evidence. The addition of false aspects to a memory of an incident is applied to as confabulation.

Works cited

McLeod, S. (1970, January 01). Loftus and Palmer. Retrieved January 04, 2021, from <https://www.simplypsychology.org/loftus-palmer.html>

Cooper, N. (2011, July 2). Loftus and Palmer Replication Crash Footage. Retrieved May 17, 2015, from <https://www.youtube.com/watch?v=Rg5bBJQOL74>

The Research and Null Hypothesis. (n.d.). Retrieved January 04, 2021, from <https://pamojaeducation.com/blog/the-research-and-null-hypothesis/>

Loftus and Palmer (1974). (n.d.). Retrieved May 17, 2015, from <https://a2psychology101.files.wordpress.com/2010/07/2-8-loftus-and-palmer-1974.pdf>

Loftus, E., & Palmer, J. (1974). Reconstruction of Automobile Destruction : An Example of the Interaction Between Language and Memory'. Retrieved May 17, 2015, from <https://webfiles.uci.edu/eloftus/LoftusPalmer74.pdf>

Loftus, E., & Palmer, J. (1995, December 1). The Formation of False Memories. Retrieved May 17, 2015, from https://webfiles.uci.edu/eloftus/Loftus_Pickrell_PA_95.pdf

Bernstein, D., Laney, C., Loftus, E., Morris, E., & Wakefield, B. (2008). The Life and Achievements of Dr. Elizabeth Loftus. Retrieved May 17, 2015, from <http://biographyofelizabethloftus.weebly.com/published-work.html>

Lunsingh Tonckens, Nicolette. (2017). Loftus and Palmer (1974): Reconstruction of Automobile Destruction. 10.13140/RG.2.2.32782.79684.

Appendix 1: Letter of consent

Informed Consent Form

Study Title: Reconstruction of memory.

Experimenter(s): Aekum Kumboj & Romharsh Mittal.

In order to participate in this research study, it is necessary that you give your informed consent. By signing this statement, you are indicating that you understand the nature of the research study and your role in that research and that you agree to participate in the research. Please consider the following points before signing:

I understand that I am participating in psychological research.

I understand that the purpose (s) of this research is to test the recalling abilities of humans, the expected duration of my participation will be 8 days (2 sessions), I will engage in these tasks: Watching videos and answering questions based on them.

I understand that my identity will not be linked with my data and that all information I provide will remain confidential.

I understand that my participation in this research project is voluntary, that my refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled, and that I may discontinue participation at any time without penalty or loss of benefits to which I am otherwise entitled.

I understand that I will be provided with an explanation of the research in which I participated and be given the name and contact information of an individual to contact if I have questions about the research. In addition, I understand that I may contact the Psychology Teacher at GD GOENKA WORLD SCHOOL (school), if I have questioned concerning my rights as a participant in psychological research or to report a research-related injury.

I understand that certain facts about the study might be withheld from me, and the researchers might not, initially, tell me the true or full purpose of the study. However, the complete facts and true purpose of the study will be disclosed to me at the completion of the study session.

By signing this form, I am stating that I am 16 years of age or older, that I understand the above information, and that I consent to participate in this study being conducted.

I WILL BE PARTICIPATING IN THE EXPERIMENT WITH MY CONSENT

☐ Yes

☐ No

Enter Today's Date:

Date

dd/mm/yyyy 

Full Name:

Your answer

Appendix 2: Question forms for groups (After showing the video)

Psychology Question Form	Psychology Question Form
Based on the video you have seen, answer the following questions.	Based on the video you have seen, answer the following questions.
How many cars did you see in the video?	How many cars did you see in the video?
Your answer _____	Your answer _____
What was the color of the car that was hit and was in rest state?	What was the color of the car that was hit and was in rest state?
Your answer _____	Your answer _____
What was the color of the car which was in motion?	What was the color of the car which was in motion?
Your answer _____	Your answer _____
About how fast were the cars going when they collided with each other?	About how fast were the cars going when they smashed each other?
Answer in terms of kilometres per hour (km/h)	Answer in terms of kilometres per hour (km/h)
Your answer _____	Your answer _____
Did you see anyone getting hurt?	Did you see anyone getting hurt?
☐ Yes	☐ Yes
☐ No	☐ No
Submit	Submit

Psychology Question Form	Psychology Question Form
Based on the video you have seen, answer the following questions.	Based on the video you have seen, answer the following questions.
How many cars did you see in the video?	How many cars did you see in the video?
Your answer _____	Your answer _____
What was the color of the car that was hit and was in rest state?	What was the color of the car that was hit and was in rest state?
Your answer _____	Your answer _____
What was the color of the car which was in motion?	What was the color of the car which was in motion?
Your answer _____	Your answer _____
About how fast were the cars going when they hit each other?	About how fast were the cars going when they bumped with each other?
Answer in terms of kilometres per hour (km/h)	Answer in terms of kilometres per hour (km/h)
Your answer _____	Your answer _____
Did you see anyone getting hurt?	Did you see anyone getting hurt?
☐ Yes	☐ Yes
☐ No	☐ No
Submit	Submit

Appendix 3: Question forms (Post week)

POST WEEK SESSION QUESTIONS

Answer the questions based on the video you saw last week

How many cars did you see in the video?

Your answer _____

What was the color of the car that was hit and was in rest state?

Your answer _____

What was the color of the car which was in motion?

Your answer _____

Did you see any broken glass

☐ Yes

☐ No

Submit

Appendix 4: Raw data

TABLE 1: (After showing the video)

LEADING VERBS	SPEED (km/hrs)				TOTAL
Smashed	60	80	150	150	440 km/hrs
Bumped	70	60	80	90	300 km/hrs
Collided	60	80	60	70	270 km/hrs
Hit	80	100	30	30	240 km/hrs

LEADING VERBS	MEAN ($\bar{x}$)	STANDARD DIVLIATION
Smashed	110	46.9
Bumped	75	12.9
Collided	67.5	9.5
Hit	60	35.5

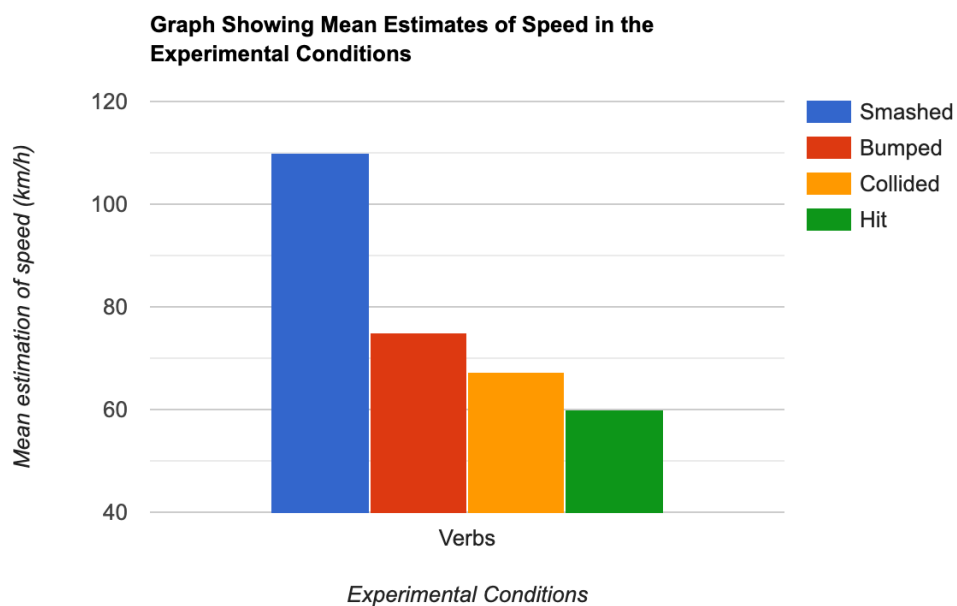


TABLE 2: (Post week)

DID YOU SEE ANY BROKEN GLASS?	YES	NO
TOTAL	6	10

Appendix 5: Briefing and Debriefing

EXPERIMENT 1

Briefing instructions:

Good Morning to one and all present here! We want to thank everyone here for taking the time out to participate in our study. We would like you to inform you this call will be recorded for analytical purposes. We want to inform you all that you all have been divided into different groups. As we are going to begin our experiment soon, we would like to remind you that we have sent out a consent form in the WhatsApp groups, which was created earlier, and you all will be needing to read it and fill it out. Please carefully read through it before you submit the form to use. This consent form will guarantee your anonymity, confidentiality, as well as your right to withdraw from this study at any given moment.

(*Post Submission of the consent forms*)

As you have filled out the consent form, we will like to begin with our experiment. We would be showing you a video, and based on that, you will need to answer the following questions by filling out the google form, which will be sent to you in your respective groups. Before doing that, we would like to describe the study to you for your understanding.

(*Post presenting the video to everyone*)

Now, we will be sending a google form to each group, which will contain a few questions. Each participant has to answer the questions individually. The google form has few questions in it which don't require any prior information on your side, so you may not need to worry. We would like you to answer the question in the form. If you have any questions, you are free to ask?

Debriefing instructions:

Thank you all for filling out the form and answering all the questions. As you all will be aware that we all will be meeting for a follow-up session in the next few days, and we will discuss further processing in that session. That is all for now that we can tell you. We would want you all not to share any information relating to this experiment with anyone else. Thank you, and have a great day! See you all in the next session.

EXPERIMENT 2

Briefing instructions:

Good Morning everyone! Thank you all for again taking out time and joining us in the follow-up session. We would like you to inform you this call will be recorded for analytical purposes. As you all are already aware that you all are divided into groups, we would now like to proceed further. We will like to begin with our experiment. We would be sending out a google form to you all in your respective groups, and you will need to answer the questions in the form. Each participant has to answer the questions individually. The google form has few questions in it, which is bases on the video you saw last week with us. We would like you to answer the question in the form. We have sent you the form, and we would kindly request you all to fill it. If you have any questions, you are free to ask?

Debriefing instructions:

Thank you all for filling out the form and answering all the questions.

The questions you all just answered were to investigate a concept known as the reconstruction of memory. This experiment was initially to see if memory could be influenced by changing the prescribing verb in the question. Memory is the sum of what people think or what they have been told and what they believe.

So, last week in experiment 1, a situation was presented in front of you where you had been shown a video of a car crash. After the video, we had sent you a google form that had few questions in it. Along with a few questions, one of them was asking the following. The question was asking, **"how fast were the cars going when they _____ into each other?"** The blank was filled with different verbs like **(smashed/hit/collided/contacted)** for different groups. As you can tell, some of the verbs vary in how aggressive they are. In this situation, the manner in which a question is framed is hypothesised to alter one's memory. Each group had different verbs in the question.

Now in experiment 2, this week, a question was asked, **"if you had seen any broken glass?"** This question was kept constant for all the groups. We also recorded the time you took to make the decision and respond to the form, something that we modified in the original study. That is all for now that we can tell you, but once we perform the analysis of the data, if you are interested, we can share the final results. We would want you all not to share any information relating to this experiment with anyone else. Thank you all for patiently dealing with the whole procedure, have a great day!

Appendix 6: Important links for the conduction

LOFTUS & PALMER

LOFTUS AND PALMER CAR CRASH VIDEO :-

<https://www.youtube.com/watch?v=Rg5bBJQOL74>

CONSENT FORM LINK :-

<https://docs.google.com/forms/d/e/1FAIpQLSeEVbBZmcO3Nqe6HiStb7JpN8VQByOZerdAw61-7UrZiyaBA/viewform>

GROUP QUESTION FORMS LINKS :-

https://docs.google.com/forms/d/e/1FAIpQLSdh9i52_F7O8qIXbD0UIIRGY2hi6Qu7Kz3acdDycJvhjgQMkw/viewform

<https://docs.google.com/forms/d/e/1FAIpQLSfi69naaGAMMpw9bxOM1CfY94mxBdKaVm5qQc5OcrKz5T0a9Q/viewform>

https://docs.google.com/forms/d/e/1FAIpQLSeKla_TDLARZM2833vleEhkGexftWdt3BpSIUPFs0hs1YK2jA/viewform

<https://docs.google.com/forms/d/e/1FAIpQLSfiVY2EVfBeQyPMxkw6HzvatfkRsPIEuxjSOQMWasQCPZ5p8A/viewform>

POST WEEK SESSION FORM LINK :-

<https://docs.google.com/forms/d/e/1FAIpQLSdAooKVQ83MPfYvuX-YiSxArpSUcJaSm11xRS9O1IK8ehzv6g/viewform>

IA CONDUCTION GOOGLE MEET LINK :-

<https://meet.google.com/wmz-rkop-wtb>

WHATSAPP GROUPS (WERE CREATED FOR PARTICIPANTS TO SEND THE FORMS TO THEM AS THE CONDUCTION WAS DONE ONLINE):-

GROUP 1 :- HIT

<https://chat.whatsapp.com/EArgEmHQ1RMDRIHY4jpyxi>

GROUP 2 :- BUMPED

<https://chat.whatsapp.com/LIDd1ikva1DGTubpXIXHgq>

GROUP 3 :- COLLIDED

<https://chat.whatsapp.com/EaWRbaIXc0qDFYCBWf7MQw>

GROUP 4 :- SMASHED

<https://chat.whatsapp.com/K3ADqlaxhy6CYOlasyaEjUI>