

Investigation of Reconstructive Memory

IB SL Psychology IA

Sample 1

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Abstract

According to Loftus and Palmer's (1974) study on reconstructive memory, it is possible to manipulate one's memory by the intensity of a word when estimating the speed of a car in an accident. The aim of this study was to investigate the effect of leading questions on estimation of speed in a car accident. We used an independent samples design, and the participants (N=23) were chosen by the opportunity sampling method. The independent variable was the intensity of the verb in the critical question; either using *bumped* or *smashed*. The dependent variable of the experiment was the participants' speed estimates (km/h) of the cars in the accidents. The participants from both groups were asked to watch a video clip of the same car accident, and then answer a questionnaire with a different critical word in the leading question. Our results do not support the results from the original study since the participants estimated the highest speed estimates when the verb *smashed* was used in the critical question, in comparison to using the verb *bumped*. However, in our study the results show higher speed estimates when the verb *bumped* was used instead. This portrays that the word intensity does not affect speed estimates of a car in an accident; hence schema doesn't influence recall, and thus not even reconstructive memory.

Word Count: 219

A. Introduction

At cognitive level of analysis memory is not completely reliable. Memories are not accurate records of our experiences since they can be influenced by other factors, due to memory being reconstructive. According to Bartlett (2009), memory is reconstructive and schemas influence recall. One of the methods he demonstrates reconstructive memory is through serial reproduction, thus duplicating the process by which rumors and gossip are spread, or legends that are passed down through generations. Through research, he concluded that people reconstruct the past by trying to fit it into existing schemas. The more complicated the story, the more likely parts of the story will be distorted or forgotten. Bartlett proposes that memory is an imaginative reconstruction of experience. Loftus also promotes the idea of reconstructive memory. She argues that some recovered memories may simply be created by post-event information. Through research and experiments, she supports the case that it is possible to manipulate people's memory. Furthermore, she states that leading questions that are suggestive and post-event information reinforce the theory of schema processing which may influence accuracy of recall.

This was demonstrated in an experiment by Loftus and Palmer (1974) where they investigated the affect of changing one word in a certain critical question and how it would influence speed estimates. The experiment involved 45 students as participants, who watched the same seven film-clips of traffic accidents. Following every clip, the participants were asked to write an account of the accident from the film. Then they were asked questions about the accident but the critical question involved the speed of the vehicles in the collision. There were five conditions in the experiment, and the independent variable was manipulated by the wording of the questions. The critical question was "how fast were the cars going when they *hit* each other?" in other trials the word *hit* was replaced by other verbs including: *smashed*, *collided*, *bumped* and *contacted*. The results of the experiment was that the participants estimated the highest speed estimates when the verb *smashed* was used in the critical question, in comparison to using the verb *contacted*. The researchers believe that this was because of a distortion in the memory of the participant. The memory of how fast the cars were travelling in the film could have been distorted by the verbal label which had been used to characterize the crash. The experiment illustrates that different verbs activate different schemas in memory. The second interpretation of this study is that the results were affected by response-bias factors, meaning that the participants adjust their speed estimate in order to fit with the expectations of the questioner. The conclusion was that the nature of questions affects recall.

The aim of this study is to investigate the effect of leading questions on estimation of speed in a car accident. The target population of this study is the students at the International School of Prague, who are multi-cultural and multi-lingual, and their age varies from age sixteen to eighteen.

B. Design

We used an independent samples design for this experiment because we tested two different conditions; if we would have used repeated samples for the design, we wouldn't be able to compare the effectiveness of the two words in the critical question on the speed estimates because by using the same participants, they would learn what to remember in the first trial and thus this would effect the second trial. To avoid confounding variables a selection of variables were controlled throughout the experiment. The video clip of a car accident was kept constant for both groups, as was the standardized instructions, to avoid any undesirable interference in the accuracy of the results. The independent variable was the intensity of the verb in the critical question using either *bumped* or *smashed*. The dependent variable of the experiment was the participants' speed estimates (km/h) of the cars in the accidents. Ethical guidelines were met, by giving the participants informed consent, which informs the participants about the nature of the study that they either agree or disagree to participate in. Moreover, the participants were debriefed at the end of the study, by revealing the study's aim and results, and allowed to withdraw their data.

C. Participants

Our sample included two different groups: the *bumped* and *smashed* group, with a total number of 23 participants - 12 females and 11 males. The *bumped* group consisted of a total of 11 participants, two females and two males who were native English speakers, and four females and three males who were not English native speakers. The *smashed* group consisted of 12 participants, including one male English speaker, and six females and five males who were not English native speakers. The participants were 16 to 18 years old from an international high school; hence they were multi-lingual and multi-cultural. We used opportunity sampling since it is an easy sampling method. We were assigned two classes on which we could test our two conditions. The disadvantage is that it may not be representative of the target population. The participants were allocated to either the *bumped* or *smashed* group by a tossing a coin.

D. Procedure

Loftus and Palmer's (1974):

1. Two groups of participants were used in the experiments.
2. The participants were allocated to the groups *bumped* or *smashed* by flipping a coin.
3. The standardized instructions were read out to the participants by one of the members of the group (see appendix iii).
4. The participants filled out a letter of consent (see appendix i).
5. Participants watched the video clip.
6. After watching the video clip, the participants filled out a questionnaire (see appendix iv).
7. Steps were repeated to other group, who had the different questionnaire.
8. After both groups finished the experiment, the results were analyzed and the participants were debriefed (see appendix ii).

Materials:

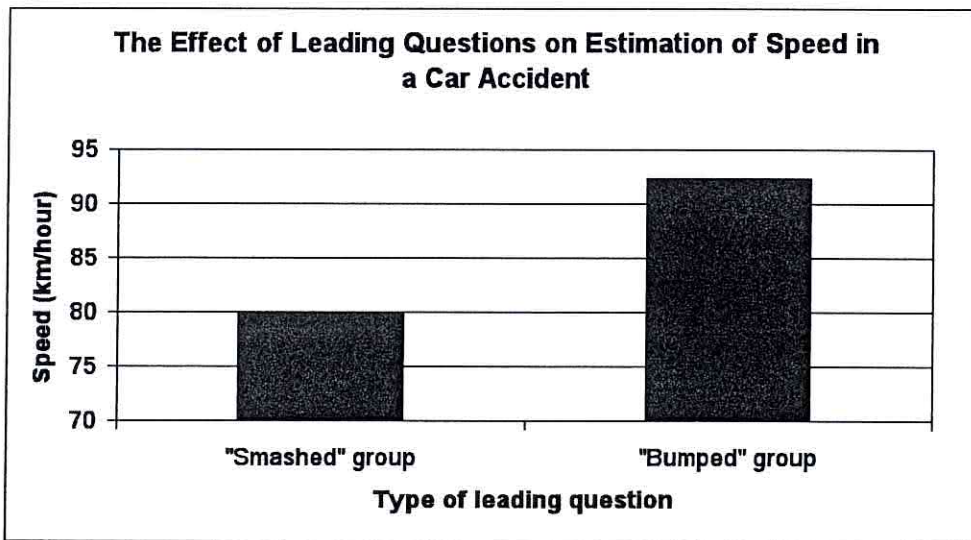
- Video clip retrieved from:
School Bus and Car Crash Head On Near Tucson Arizona [Motion picture].
(2009, September 23). United States. Retrieved from Youtube database.
- Standardized instructions (see appendix iii)
- Debriefing notes (see appendix ii)
- Two questionnaires (see appendix)
- Letter of consent (see appendix i)

E. Results

Table 1: The standard deviations and means of both groups

"Smashed" group Speed Estimate (km/h)	"Bumped" group Speed Estimate (km/h)	
80.0	92.4	Mean
26.1	16.7	Standard deviation

Figure 1:



The mean speed estimate for the *smashed* group was 80km/h, while the *bumped* group had a mean of 92.4km/h. The standard deviation demonstrates the variation of the data, and how far do these values fall from the mean. The standard deviation was higher for the *smashed* group (26.1) than the *bumped* group (16.7); the standard deviation is higher for the *smashed* group due to outliers, while the *bumped* group had a smaller range of data. The raw data may be found in appendix v.

F. Discussion

The results for the original study showed that the participants estimated the highest speed estimates when the verb *smashed* was used in the critical question, in comparison to using the verb *bumped*. However, in our study the results don't support the original study's findings since our results show higher speed estimates when the verb *bumped* was used.

The reason why we could have gotten these statistics may be due to the fact that we had to exclude some data as a result of language issues of the participants. These participants didn't answer the questionnaire with a speed estimate value, therefore, decreasing the amount of data we received from the *smashed* group. After disposing the unusable data, we were left with only six usable data values, in comparison to the *bumped* group with 11.

An issue with the design and procedure was the questionnaire, since some of the participants didn't interpret the question the way that was expected. Consequently, if this experiment would be repeated I would suggest carrying out a pilot study to ensure that the instructions and questionnaires were usable, eliminating or at least reducing the confusion based on language-based factors.

In conclusion, based on our data and statistics, leading questions do not affect ones memory since the *smashed* group estimated lower speed estimates of a car in an accident than the *bumped* group. This portrays that the word intensity does not affect speed estimates of a car in an accident; hence schema doesn't influence recall, and thus not even reconstructive memory.

Works Cited

Crane, J., & Hannibal, J. (2009). *IB Diploma Programme: Psychology Course Companion*. Oxford: Oxford University Press.

Loftus, E.F. & Palmer, J.C. (1974) Reconstruction of auto-mobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behaviour*, 13, 585 -589 Retrieved October 24, 2010, from AS Psychology holah.co.uk

School Bus and Car Crash Head On Near Tucson Arizona [Motion picture]. (2009, September 23). United States. Retrieved from YouTube database.

Appendix i: Informed Consent Letter:

In this experiment, we will investigate reconstructive memory. The experiment takes less than ten minutes, and you may stop participating or withdraw your data at any given time. There are no dangers involved and your data will be kept anonymous and confidential. When the experiment is done, and the data has been compiled and analyzed, you will be debriefed about the results.

I, _____, understand the above statement, and understand that I can stop participating in the experiment at any time in addition to withdrawing my data.

We also ask that you answer the following questions:

Are you a native English speaker (Yes/No)? _____

Gender (F/M): _____

Student Signature: _____

Date: _____

Appendix ii: Debriefing notes

Dear participants,

We would like to thank you for participating in our experiment. This experiment was based on Loftus and Palmer's research on reconstructive memory. Their study investigated how the intensity of the operative verb in a leading question affects speed estimates of the car crash.

We used two different classes (one was your class), and we showed both classes the same video of a car crash. We then gave one class a questionnaire asking you to estimate how fast the cars were going when they bumped into each other. The other class had the same questionnaire, except they were asked to estimate the speed of how fast the cars were going when they smashed into each other. As you can see, by changing the intensity of the critical word, we expected to see a change in speed estimations. Our hypothesis was that the "smashed" group would have higher estimations of speed because "smashed" is a more intense verb than "bumped" and it would activate a different schema than bumped. We asked whether you were a native English speaker or not because we wanted to control our variables in the experiment. This is important because we attributed most of our to language comprehension.

By looking at our results for both groups, the average speed estimates for "bumped" were actually higher than the average speed estimates for "smashed", which refuted our initial hypothesis, as well as Loftus and Palmer's findings. We would like to remind you that your data will remain confidential and your privacy is protected.

Thank you for participating in our study, and we appreciate your help.

Appendix iii: Standardized Instructions:

1. You will be participating in an experiment testing your memory of a video clip, and we kindly ask that you refrain from talking starting now.
2. Before we begin the experiment, we ask you to please remove all items from your desk except for a pen or a pencil.
3. We also ask that you please sign the consent form that we are about to distribute and we will collect it after you're done.
4. We will now distribute a questionnaire and we ask that you turn it over after you have seen the video clip.
5. You now have two minutes to fill out the questionnaire, using numbers, and we will inform you when time is up.
6. (2 minutes later) We will now collect the questionnaires and the experiment is finished.
7. Thank you for your participation and we will come back to debrief you.

Appendix iv: Questionnaires:

- Questionnaire for *bumped* group:

About how fast (km/h) were the cars going when they bumped into each other?

- Questionnaire for *smashed* group:

About how fast (km/h) were the cars going when they smashed into each other?

Appendix v: Raw and Processed Data

Raw Data:

Smashed group Speed Estimate (km/h)	Bumped group Speed Estimate (km/h)
90	97
120	100
40	100
80	80
80	89
70	70
	60
	100
	120
	100
	100

Processed Data:

	Mean	Standard Deviation
Smashed group Speed Estimate (km/h)	80.0	26.1
Bumped group Speed Estimate (km/h)	92.4	16.7

