

# The effects of leading questions on memory



The aim of this experiment was to investigate the effect of leading questions on memory. This was done by showing a photograph of a car accident towards two treatment groups, and then make the participants answer a questionnaire(s). The difference between the questionnaires were the verbs used (IV; “ crash” and “ contacted”). The answer was regarding the speed estimation (IV) of the cars when the accident occurred. This experiment was a replication of the one Loftus and Palmer conducted in 1974. The results from this experiment did not favour Loftus and Palmers results. Due to certain limitations and changes from the original study this report concluded that the possibility of leading questions altering memory should not be disregarded, but rather further studies using other methods should be conducted since the topic is important.

This study is a simpler replication of the Loftus and Palmer 1974 study. The aim of the original study was to investigate the possibility of altering the memory of people who had been eye witnesses to car accidents. The car accidents were presented through short movie clips. Afterwards the participants were given a series of questions where only one question was critical; at what speed was the car travelling? The question was presented using different verbs concerning the collision itself, e. g. about how fast were the cars going when they collided with/smashed into/bumped into/hit/contacted each other?

Loftus and Palmer found out that the stronger verbs resulted in higher mean value estimates of speed:

Smashed

40. 8 miles per hour (65 km/h)

Collided

39. 4 miles per hour (63 km/h)

Bumped

38. 1 miles per hour (61 km/h)

Hit

34. 0 miles per hour (55 km/h)

Contacted

31. 8 miles per hour (51 km/h)

They concluded that the different strength of verb are likely to influence the estimated speed, that when the subject is uncertain whether to say 30 mph or 40 mph (...) the verb smashed biases his response towards the higher estimate[1]. Another bias was that the subjects would just make up an answer.

The effect of leading questions is very important to this day in people's everyday lives e. g. in juridical courts and during witness testimonies. The essence is not to make use of them, but rather to detect them and be able to defend against them and expose them. This deals with how language affects our minds and changes human behaviour, like stating a higher speed estimate.

The aim of this study is: To investigate the effects of leading questions on the memory of car accident eye witnesses.

## Method

### Design:

The independent samples design was used. This was because both groups were going to be treatment groups, receiving slightly different ending questions. If all participants were given both questionnaires they would notice the difference between the sheets and would guess the investigating factor, the IV. This would be an order effects bias.

The Independent variables were the verbs used; « crashed» and « contact».

The Dependent variable was the participants speed estimation (km/h).

The two groups were given the two different IVs separately, and any difference in the DV in the findings was being closely looked for.

The photograph[2]presented was non violent and portraying only 2 deformed cars standing close to each other (copy in appendices). It was in no way harmful toward the participants.

Before each experiment began, the participants were told that they would be shown an image and that they were to use their memory as well as possible for the 15 seconds that the image would be shown. This was the briefing[3]. After each experiment the participants were debriefed[4], showing them the IV which would be changed for the next group. Both briefing and debriefing

was done orally. Also, the different groups did not have possibility to interact between the experiments.

#### Participants:

There were in all 70 participants, divided into two groups, 35 in each. The participant sampling was created using opportunity, since it was easiest. The participants were all Norwegian 1st and 2nd grade High School students, between 16-17 years old, and the gender distribution was approximately 50/50. Two teachers were asked if the experiment could be conducted in their classes. The allocation was random since it was just decided that the first teacher's class would be given the first questionnaire, and the other class the other questionnaire. As mentioned above all participants were allocated to treatment groups. Due to age and gender distribution the groups were equivalent. No pupils aging less than 16 were allowed to take part, since this would require the permission from parents. The questionnaires were written in Norwegian, but copies of translated questionnaires are included in the appendices[5].

#### Materials:

All materials are found in the appendices.

Questionnaires

Briefing note

Debriefing note

Photograph

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## Procedures

First the the two questionnaires were created digitally, printed out and copied. Number of questionnaires were adequate to participant number. The question sheets contained three questions. Only participants being 16 (+) years old were given questionnaires[6]. 35 of the participants were given questionnaires including the word “ contact” in the 3rd question, while the other 35 participants were given questionnaires with the word “ crashed” also in the 3rd question. The experiment was performed in two different rooms, two different classes. After the oral briefing[7]with explanation of what to do, both groups were shown the photograph[8]for 15 seconds and each participant answered his/hers question sheet individually in 2 minutes. Afterwards the debriefing[9]consisted of telling what the aim of the study was. The experiment lasted 10-15 minutes with each group, approx. 30 minutes totally.

## Results

Group 1, the “ contact” group, averagely estimated a higher kilometre per hour speed than Group 2, the “ crashed” group, did. This is basically the result that the aim was looking for in order to answer; do the leading questions/verbs affect the memory and thus the recorded speed by the accidents witnesses? The results did also, however, overlap to a great extent. This can be shown using error bars. Similarly to Loftus and Palmer:

Group verb

Mean speed estimated

Standard deviation

Range

“ Contacted”

65km/h (+/-1)

20

90

“ Crashed”

61km/h (+/-1)

17

60

This graph also shows how the results overlap significantly:

Discussion

Both the results from this study and Loftus and Palmers study show differences between the different groups estimations. This could signal that the leading questions actually change the memory of the participants. In the Loftus and Palmer results the word “ smashed” produced the highest speed estimate (65 km/h) verses the weakest verb “ contacted” (51 km/h).

However, this study presented a higher speed estimate when using the verb “ contact” (65 km/h) than when using the verb “ crashed” (61 km/h). This study can therefore not reach the same conclusion as Loftus and Palmer did

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in 1974. Furthermore, these results are not consistent on the fact that while the Loftus and Palmer results created a 14 km/h difference, this study showed only 4km/h difference. This might mean that the Loftus and Palmer conclusion should be disregarded. On the one hand, the results of this study differ significantly from the results of Loftus and Palmer. On the other hand, the methods of both studies are to some extents very different. These differences could explain why the results contradict.

First of all, Loftus and Palmers subjects were shown different video clips presenting car accidents. In this study only a photograph was shown for 15 seconds. The impression of such a movie clip is probably stronger than the photograph used in this study, where one did not even see the contact or crash itself. This stronger memory is perhaps more adaptable to leading questions than a short memory of two deformed cars, and could thus affect the answer. A change is proposed; to use video clips in this study as well.

Secondly, the age difference between the college students of Loftus and Palmer compared with the 1st and 2nd High School students. The older ones would try to be more serious, and the range between the estimates would be lower due to probably more car driving experience. The younger students are therefore more uncertain when answering, creating a range of 90 and 69 km/h. A change would be to use older participants.

Thirdly, Loftus and Palmer included 5 different verbs verses the 2 verbs used in this study. The significance of this limitation is however difficult to see, but still the replication would be even more faithful to the original study. Using 5 verbs in the replication study is proposed.



The 3 suggested modifications should be implemented in future studies. This would disable the limitations discovered. Further studying and even more similar replications could be conducted to find better answers to the aim of the study. Totally different procedures and studies could be used. Presenting a photograph or video clip of a couple kissing and then asking questions as to the tenderness or love that they have for each other using different verbs would be interesting.

In conclusion; perhaps the results from this study do not disprove the hypothesis of the original study after all. Leading questions can perhaps still alter memory to some extent. The overlapping of the results makes their stand on a quite uncertain ground. Of course, if this discussion could have known the error bars from Loftus and Palmer as well then it would be interesting to see if they overlap to the same extent. Also, any implications towards their results could then be suggested stronger.

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## **References**

<https://webfiles.uci.edu/eloftus/LoftusPalmer74.pdf> 30. 12. 2009 8. 24 p. m

Appendices

Appendix 1: Questionnaires

Crash:

Psychology experiment on memory

1) Which colour were the cars?

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\_\_\_\_\_ and \_\_\_\_\_

2) How many cars were in the picture?

\_\_\_\_\_

3) At what speed do you think the cars were travelling at when they contacted?

\_\_\_\_\_ Km/h

Contact:

Psychology experiment on memory

1) Which colour were the cars?

\_\_\_\_\_ and \_\_\_\_\_

2) How many cars were in the picture?

\_\_\_\_\_

3) At what speed do you think the cars were travelling at when they crashed?

\_\_\_\_\_ Km/h

Appendix 2: Briefing note

« You are about to take part in a study on memory. We will show you a picture of a car crash, and we want you to pay attention to it. If you should want to withdraw from the study, it can be done at any time. You should also know that all contributions will be anonymous. During the experiment, it is vital that you do not talk to each other.»

### Appendix 3: Debriefing note

« This was a study on how leading questions affected your memories. The first two questions were not of importance to the study, however, some of you were given a questionnaire where the last question asked « At what speed do you think the cars were travelling at when they crashed?» and some of you were given a questionnaire with the question « At what speed do you think the cars were travelling at when they contacted?». Are there any questions?»

### Appendix 4: Photograph of car accident