

Misinformation Effect on the Visual Semantics: Analyzing the Inverse Approach

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Abstract

Misinformation effect means the impairment in the memory of the past event when a misleading information is provided for that event after its occurrence[1]. The first known study in this area was done by E. Loftus *et al.* After that few studies and experiment have been conducted by the researchers which showed that the results found out gave the notion about the generality of the findings. The information that was given in most of the experiments was either consistent, misleading one or an irrelevant at all. It was observed that misleading information produced more incorrect responses as compared to consistent or irrelevant information[2]. Present study tries to focus on the modified methodology and experiment used by Okado and Stark(2005). Here I have tried to analyse the situation of inverting the approach taken by the original experimenters i.e. first to give the narration information and then to provide the visual information alongwith the original experiment for the comparison. I have tried to find out its significance which also includes the distinction based on the age group. The results obtained, validated the phenomenon and shed some light on the age dependency of this effect. A striking observation was found which was the main goal of doing this project in the first place. The inverse approach showed that the frequency lowered as compared to the normal approach of conditioning.

Keywords: Misinformation effect, memory impairment, misleading information

Introduction

In the late 70s, Elizabeth Loftus and her colleagues performed five similar and exhaustive experiments showing that the information provided after an event shown, influences the memory of the subject for that event. The results found out gave the notion about the generality of the findings. The idea that prevailed in the textbooks that memories when once formed are permanently stored was strongly challenged by these experimental outcomes. The fact that verbal information provided post-event integrated into the visual semantics was very fascinating. Since then a lot of research has been done to find out more about the plasticity and reliability of the memory and its origin. It was found by McCloskey and Zaragoza (1985) that no matter how the tests are done, the result is the same memory report. Also, if there is any absence of impairment, then too people faithfully adopt the misinformation as their own is remarkable[3]. A research was done by Okado and Stark (2005) which tried to find out the neurological basis of this phenomenon with the help of fMRI imaging.

Motivation

The unique similarity in all the procedure of experiments conducted is that all (to the best of knowledge) had been testing the misinformation paradigm on the visual input only by giving deceiving information post visual stimulus. Also, I never came across any experiment which validates these facts for the semantic input i.e. what could be the effect if the verbal information is shown first and then the visual stimulus is presented which can act as miss-cue or misleading information. Will the outcome be similar to that previously observed or will it have a significant difference. This motivated me to do the course project under this topic.

Experiment and Method

I have used the materials provided by Patihis L., a student of Loftus E. who is currently doing a similar study as part of his masters' thesis[4]. The material

consisted of modified version of experiments done originally by Okado and Stark (2005)[5].

The experiment basically consists of showing visuals of a pickpocket robbing a girl on the streets and the narration of the same visuals. The sequence followed was not always as shown here. The other way round was also done on at least half of the subjects of 18-35 age group. The visual slides consisted of 50 image slides and each slide lasted for around 3500ms. The verbal narration slides corresponded to those 50 slides individually and each slide lasted here for nearly 5500ms. A total of 40 subjects participated in this experiment 23 subjects belonged to 18-35 years age group whereas remaining 17 belonged to below 18 years age group. The detailed procedure followed for 18-35 age group is listed below:

a. Experiment picture slides

b. Narrative slides for set A

c. Narrative slides for set B

Group A1 – order of viewing is first (a) then (b) → consisted of 4 subjects

Group A2 – order of viewing is first (b) then (a) → consisted of 2 subjects

Group B1 – order of viewing is first (a) then (c) → consisted of 3 subjects

Group B2 – order of viewing is first (c) then (a) → consisted of 6 subjects

Group X – only (a) → consisted of 8 subjects

The subjects in the below 18 age group were made to follow the procedure of Group A1.

All the subjects were unaware of the basis of the experiment study. Immediately after the conduct of the experiment, subjects were asked to fill up a Google form which consisted of 9 questions based on the image sequence seen and the narration read. Out of that 3 questions were based on the misinformation provided in the narration for both the types of narrations. Group X gave an estimate of the raw control group. The misleading information in Set A was

correct information in Set B and vice-versa. This means that one set became the control group for the other set.

The deceiving information (correct answers) in Set A on which questions were asked are:

1. The girl showed Simpsons (South park) DVD
2. The man kept the wallet in his pants (jacket) pocket
3. The woman had a green (Red) backpack

Same thing in Set B were:

1. Took the wallet with right (left) hand
2. Jane took out a blue (white) cell phone
3. The man who was hiding came out from behind a tree (doorway)

This means that questions 3, 6, 8 tested set A's misinformation whereas questions 5, 7, 9 tested set B's misinformation.

The data obtained was then analyzed using windows MS office software – Excel. The data was collected in its spreadsheet and various bar graphs and charts were formed to study the changes if any that can be found. The numerical value of all correct responses divided by the sum of the correct and misinformed choices is taken for each question for each type of group. And then a graph is plotted to find out the significance or the deviation than normal. This was plotted against the serial number of the conditioned questions.

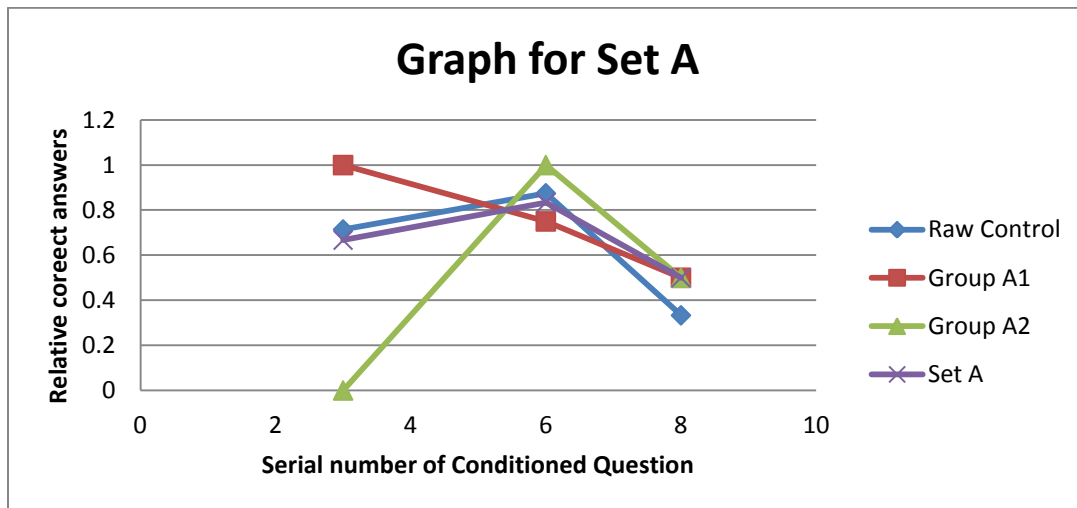
New Approaches and Modifications

As stated before, the material was obtained from Patihis L. which is the modified version of the Okado and Stark's method. Here a major modification which I did was including the testing of the inverse approach which to the best of my knowledge was not done by the authors mentioned in this report. The pictures

slides were shown as it were, but the narration was changed at few instances to suit the requirements and understanding of the subjects in the local context. Also the making of the graph was different slightly. I have assumed that totally irrelevant answers in misinformation testing questions had no role to play and this only considered the actual and misinformed ones. The ratio of the relative correctness for each misinformation testing question is calculated and plotted against the serial number of the question tested.

Results and Discussion

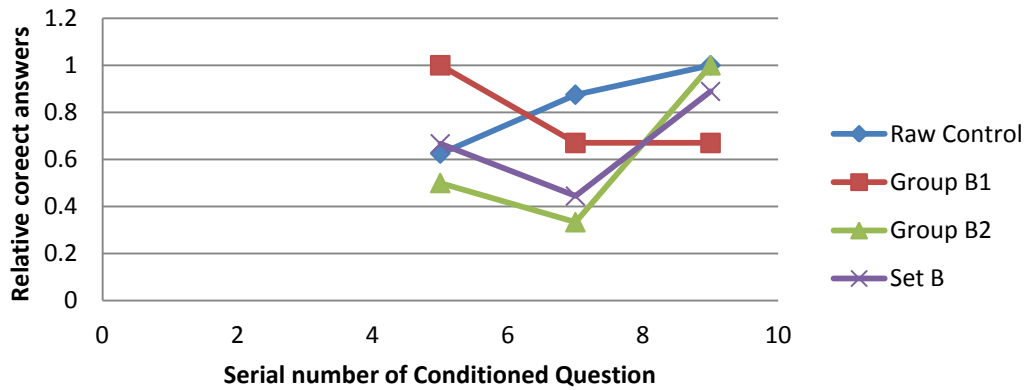
1. Individually seeing the graphs of Set A and Set B gives an idea that overall each set has lower relative correct answer on an average as compared to the 'Raw Control' group. This is in consistence with the findings of the Misinformation effect.



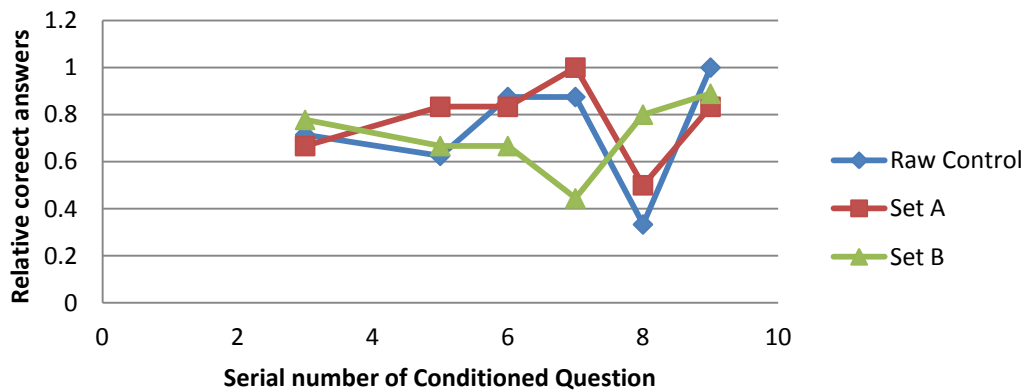
2. It is also found that the errors in Set A for their misinformed questions are more than those in Set B and similarly, in Set B, the errors for their misinformed questions are more as compared to that in Set A.

3. Overall, it is observed that Set A has witnessed more right answers than Set B.

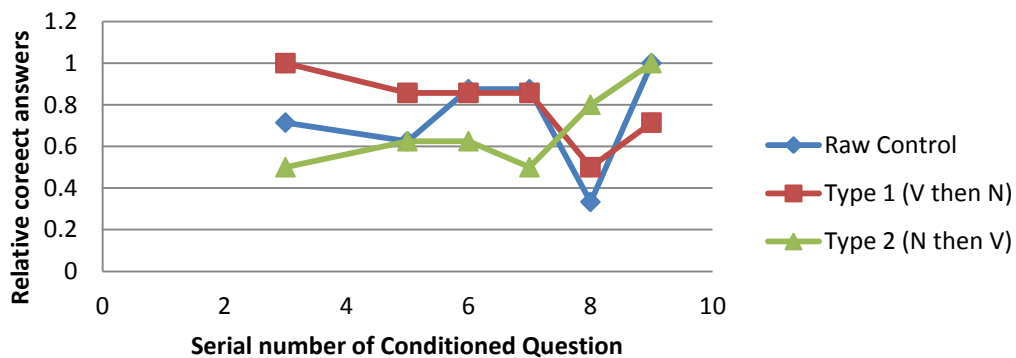
Graph for Set B



Comparison between Set A and Set B

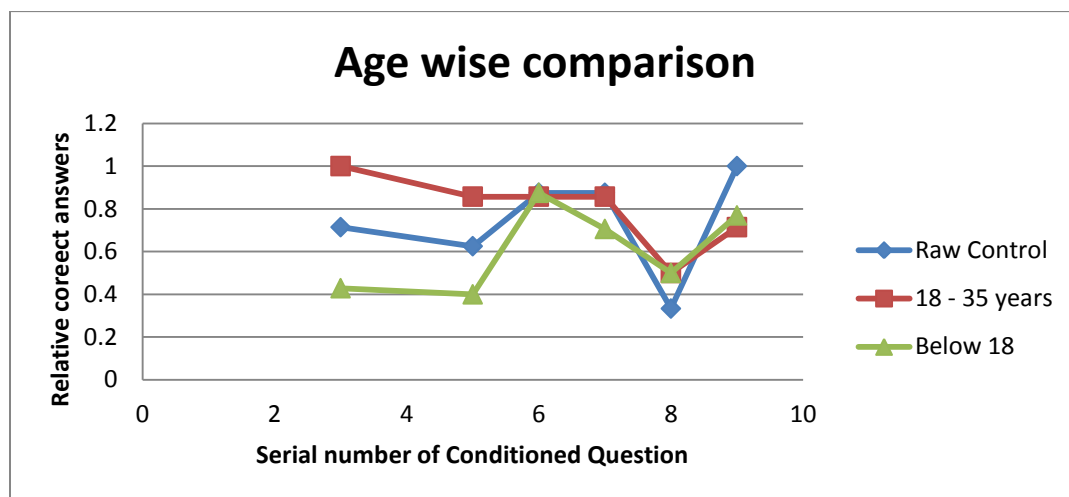


Comparison of Narration(N) and Visual(V) sequencing



4. Coming to the main hypothesis testing i.e. knowing the significance of the sequence of showing, above graph depicts that giving first narrative stimulus and then providing with the visual stimulus results in greater number of errors than the other type for all the possible misinformed questions. This means that traditional way of testing gave lower true positive values and now it can be seen that these value are lower as compared to those traditional results.

5. Seeing the fifth graph, it can be noticed that the age factor also counts for the effectiveness and the extent of this phenomenon to take place. It can be seen that the lower age group has lower frequency of right answer as compared to the adult group. One possible reason for this result is that maybe the subject sample taken for lower age group was weak in comprehending the narrative part and also the sampling was not properly done. For this reason, it cannot be conclusively said that age factor accounts for this effect to take place.



Acknowledgement

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Additional details

All the additional detail and information is provided in the data.zip file present at the site where this report is uploaded. This data contain all the relevant information needed to know for doing this experiment and also the data collected on the basis of which the results are found out.

References

[1] http://en.wikipedia.org/wiki/Misinformation_effect

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[5] Okado Y. and Stark C. Neural activity during encoding predicts false memories created by misinformation. Learn. Mem. (2005)