The Impact Emotion Has On Memory

Candidate name:

Candidate number:

Centre number:

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Method

Design

A laboratory experiment was used to manipulate the independent variable (which was either the emotional or neutral words that the participants have to recall) to observe the effect on the dependent variable (which was the number of emotional and neutral words participants recalled), under controlled conditions. There were two conditions in the experiment. Condition A involved participants being presented with only emotional words and recalling them. Condition B involved participants being presented with only neutral words and recalling them. The design involved was an independent groups design where there were two groups of participants one for each condition. The study contained one recall list sheet and one maths answer sheet, which were used to collect the results of participants. A pilot study was conducted before carrying out the experiment using only 6 participants both males and females. From the pilot study it was found that participants felt that the retention interval for recalling the words was too short. Also participants were more influenced by other participants and sought for cues on how to behave from other participants as all participants took part in the study at the same time and place.

Participants

An opportunity sample of 20 males and females took part in the study. For each condition 10 participants took part. Participants were taken from the sixth form at St Mark's School. The participants' ages ranged from 16 – 20. Those participants who were available at the time took part in the study. Each participant took the experiment individually at convenient times for themselves.

Materials

A list of 20 emotional and neutral words were collected (see appendix for full list of words) for each condition. In both conditions the words were presented separately on a slide on the PowerPoint presentation. The following slides consisted of three simple maths questions. The maths questions were shown as an interference task and after participants were given a maths answer sheet to write down their answers. The maths questions were made sure not to have any cues for guessing the words. All the words were typed in the font Times New Roman and were of the same size at size 16. After completing the interference task participants were given an A4 recall sheet to write the words they could remember. A watch was used to time the participant. The participant was given two minutes to recall as many words as they could remember. The investigator also carried a script they would read to participants before the study and another they would read to participants after the PowerPoint presentation and also a debriefing script.

Standardised Procedures

The experiment was carried out at convenient times for each participant during break times.

1) 20 sixth form students were asked to take part in our study during break times.
2) Participants were approached and asked if they did not mind participating in a psychology experiment for 15 minutes.
3) Each participant was taken to a classroom to take part in the study on their own, away from the distractions of other students.
4) Participants individually heard the standardised instructions (see appendix for full standardised instructions), here informed consent was given and participants could withdraw if they wished to.
5) Participants were shown the PowerPoint presentation, which included on each slide rather an emotional or neutral word depending on which condition they were taking part in. Each condition had 20 words, which were either emotional or neutral words.
6) Once the slides of all 20 words were complete participants were given a maths answer sheet by the investigator and then shown the rest of the PowerPoint presentation that consisted of three simple maths questions.
7) The participants were given five minutes to complete the maths questions.
8) The participants then heard the second set of standardised instructions that were read out by the investigator.
9) The participants were given the recall sheet that had twenty spaces for each of the words. Participants were asked to recall as many of the words from the PowerPoint presentation in any order. They were given two minutes to do this task.
10) After two minutes the investigator collected the recall sheet from the participant.
11) The participants were then given standardised debriefing (full standardised debriefing is in the appendix) also the right to withdraw their data from the investigation and told that their data would remain confidential.

Controls

The study contained several controls. Asking participants to participate individually and not allowing them to see the recall list of others controlled social desirability bias. Confounding variables were kept at a minimum by carrying out the experiment in a classroom. Secondly a single blind design was used to reduce the amount of participant reactivity. The uses of standardised instructions were to provide a minimum of investigator effects. To ensure the study was not gender or cultural biased a wide range of different participants were used both male and female from different cultures to take part in the study.

Ethics

The different ethics in the study that were overcome by informed consent. Participants were given the right to withdraw their data at anytime during the study. Participants

were also informed that their results would stay anonymous. The minor deception within the study was also overcome by debriefing the participants after the experiment had taken place about the nature and purpose of the study. Also other information about the participants was kept confidential. During the study no participants felt the need withdraw or withhold any of their data.

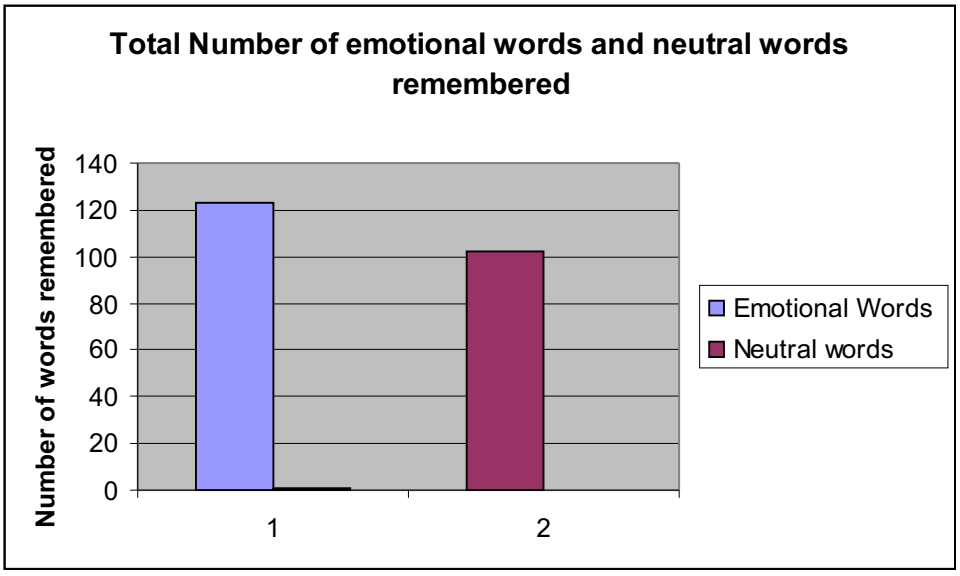
Results

Descriptive Statistics

The table below shows the findings from the study and compares condition A with condition B. The table is a summary of both averages for the emotional and neutral words remembered by the participants in condition A and condition B.

	Average number of emotional words recalled. (condition A)	Average number of neutral words recalled. (condition B)
Mean	6.15	5.1
Median	6	5
Mode	6	5
Standard Deviation	1.35	1.68

The graph below shows the total number of emotional and neutral words remembered by the participants. From the graph it is evident that emotional words had higher recall than neutral words.



Inferential Statistics

From the graph it is evident that after being given an interference task, recall for emotional words was higher than recall for neutral words. This does not support the experimental hypothesis. To decide whether the results were significant an inferential statistical test was used.

Level of Significance

A Mann-Whitney U test was used due to the following reasons:

- The hypotheses predicted a difference between the two sets of data.
- The data used were the number of words recalled which is interval data.
- An independent groups design was used.

The level of significance selected was $p<5\%$. The results show the value of U for this data is set at 22 which is just below the critical value of 27, this shows that the results are significant. This allows the experimental hypothesis to be accepted. The experimental hypothesis is as follows:

There will be a difference between recall of emotional and neutral words.

(See appendix for workings).

Discussion

Discussion of findings

The experimental hypothesis stated that there will be a difference between the recall of emotional and neutral words which has been clearly shown in the graph. These results suggest that emotion may have an impact on the memory. As the null hypothesis has been rejected in favour of the experimental hypothesis this means that emotional words (as shown by a mean of 6.15) are generally better remembered than neutral words (as shown also by a mean of 5.1). The Mann-Whitney U test shows that the study was significant even though there was not much of a difference between the results. Moreover more emotional words were remembered by participants than neutral words showing that emotional words did have some impact on the memory of the participants. However individual differences did occur as some participants did have a high recall of neutral words in comparison to participants' recall of emotional words showing that emotion is not always the trigger for memory. Emotion does seem to have caused better recall for the participants highlighting that there may be a link between the emotion and higher recall. Despite the results not having a great difference there is nevertheless significance in the findings.

Relation to background research

Brown and Kulik (1977) had proposed emotion can cause memory to heighten, causing flashbulb memories. This statement can provide evidence to support the hypothesis and the results of this experiment. As the participants were shown emotional words these may have been encoded straight into the memory causing them to last for recall as the words were emotionally loaded.

The research carried out by Sheingold and Tenney (1882) found people had good memories for a birth of a brother or sister. These accounts remained consistent and even the time and place were remembered. Their research supports this study as it shows proof that the impact of emotion caused memory recall to increase. However it can be argued that the accounts used in Sheingold and Tenney's study have no way of checking whether the accuracy of the accounts given is absolutely true.

Alternatively the levels of processing model of Craik and Lockhart (1972) showed that things were processed in the memory more deeply due to its meaningfulness. It supports the findings as emotion was shown to be able to enhance how deeply the information was processed.

These findings also support Johnson and Scott (1978) conducted a study where participants could hear a fight taking place. Some participants were in a high stress condition and others in a low stress condition. Those in high stress condition had better recall than those in the low stress condition. These findings provide that the emotion caused stress which allowed for stronger memories and better recall.

The results found in the study do contradict findings from Kohler and Wilke (1999) who found a correlation which was drawn up between the emotion score and how well the words were remembered. They found that in both long term and short term memory emotional words were recalled less well.

Bradley and Baddeley (1990) found that immediately after an interference task, recall was less significant for emotional words than neutral words which show contradiction to the findings as they show opposite. However it can be taken into account that Bradley and Baddeley found a repression effect as the retention period in the experiment was up to 28 days, which found emotional words to be better recalled than neutral words. This shows emotional words to impact memory and leave a lasting effect over time, this supports the hypothesis of the study.

Emotion based on these findings and pervious research mentioned leads to enhance and intensify memories. This shows that emotion is still a complex mechanism that has direct impact on memory.

Limitation and modifications

The first limitation to the study would be the population sample used which was an opportunity sample of only sixth form students who were asked to participate in the experiment. This causes a biased sample and does not consider the whole population. The modification to this could be to have a different sampling technique such as random sampling; this would allow every member to have an equal chance of being selected. This would be fair and not potentially biased.

Another limitation would be what the mood the participant was in during the experiment. This may have caused them to remember the emotional words more as they could relate to them at the time depending on the mood they were in. To control this confounding variable the participants could have been given a personality test to calculate their mood before taking part within the experiment.

Lastly a limitation to the study was that only a single blind test was used within the study, this opens the study with investigator effects such as the green spoon effect in which the researcher could have given hints to the participants as they recalled the words. A modification that could be made is to use a double blind study so that neither the participant nor researcher would know the aim of the study.

Further research

The implications of these findings provide evidence that people remember more emotional words than neutral words. It also shows how memory and emotion link together. It explains how events that are personal are kept on a more emotional level leading to better recall. Also it shows that the more memorable the memory the better it will be remembered. The study can also show implications of how the human brain

works. It can help explain that memorable experiences are stored within the human brain. The study can show implications of why and what is needed for memory to become processed. Perhaps some element of emotion or depth is needed to process the memory. An important factor is learning through whether accounts of eye witness testimony are reliable. The more emotionally charged the event the more likely it would be recalled accurately whereas if the event was neutral the witness may pay less attention to the event causing less well recall. The findings could also enhance different learning techniques such as adding more emphasises with emotion while learning certain information.

Further research that could be carried out would be to study the difference that emotional words would have on genders. It would be expected for women to recall more emotional words rather than neutral words due to their sensitive nature and them having a much more sympathetic approach to situations than men. It would be interesting to see if genders have any difference at all in the recall that could be conducted.

Other further research that could be conducted is to see whether different personality types could be better at recalling emotional words or neutral words. Different personality types may be less likely to be affected by emotional words such as hardiness personality rather than type C personalities that would take the emotional words more into account. This could still however suggest individual differences. Further research could also be to test by comparing pleasant emotional words to unpleasant emotional words are remembered. This could give further support to how the human brain works.

Also the difference between younger and older people could be tested to see if the emotional words do affect older people as they may have experienced more of the emotional words in depth than younger people who may take less notice of the emotional words.

In addition further research could challenge the idea of changing the emotional and neutral words to fit within certain cultures. Different cultures may find different words more emotional to them. The emotional words can link with the individual's culture to see if this would cause better or worse recall.

Conclusion

From the study it can be concluded that emotional words have more of an impact on memory than neutral words causing them to be recalled better. The findings support this as it shows that participants in condition A had better recall of the emotional words in comparison to the participants in condition B who were recalling neutral words.