

An investigation into the Affect of Organisation on memory.

This study is concerned with the cognitive approach, in particular the area of memory, and how the arrangement of data into organised and disorganised categories affects memory and the ability to store and recall data.

Research

Short-term memory is believed to have a capacity of 7 ± 2 'chunks' of information, which can remain there for approximately 20 seconds without rehearsal.

Chunking is a process that apparently increases the capacity of short-term memory by relating and combining the incoming information to knowledge that we already possess in long term memory. In chunking we organise information giving it a structure and meaning that it did not already have, so although we can only recall around 7 chunks a meaningful chunk can be very large

Previous research has been done by other psychologists into the affect of organisation on memory.

In 1953 Bousfield asked participants to try and learn 60 words consisting of 4 categories, (animals, people's names, professions and vegetables) with 15 examples of each all mixed up. Bousfield found that when participants free recalled (recalled in any order) they tended to cluster similar items, Eg: if someone recalled 'onion' it was very likely that other vegetables followed. Although participants had not been told of the categories, the fact they recalled in clusters suggested that they had tried to organise the data. Bousfield called this trend 'categorical clustering'.

Another study took place in 1967 by Mandler, where subjects were given lists of random words and asked to sort them into a given number of categories (between 2 and 7). Once sorted the participants were asked to recall as many of the words as possible. The results showed that recall was poorest for those who used 2 categories and increased steadily by about 4 words per extra category. Those with 7 categories recalled approximately 20 more words than those who used 2. Mandler argued that the greater number of categories used, the greater amount of organisation was imposed on the list.

However my particular study is inspired and based on a later one by Bowers et al in 1969, in which data was organised by conceptual hierarchy. In this study participants were required to learn a list of words which were arranged in a hierarchical structure. See appendix 1.

The participants studied were split into 2 groups, one group were given the list in the correct hierarchical form, the other group were given the same words in a similar structure however the words were mixed up.

Rationale

The results of Bower's study showed that the list organised by conceptual hierarchical order did indeed promote a higher recall of words than the list arranged in a random order. The organised list proved to have an average of 65% words recalled correctly whereas the disorganised list only recalled an average of 19% correctly.

My study is based on the above 'conceptual hierarchy' model. My model will mimic Bowers by having a main heading which splits into several subheadings in a hierarchical form, these headings will then have a list of appropriate words underneath.

However, as Bower used the theme of minerals, splitting into categories such as alloys and metals etc. I am going to use the general theme of food splitting in fruits, salads and vegetables.

Aim

The aim is to investigate the affect of organisation on memory by finding out if people remember more words from an organised list than they do from a disorganised list of words.

Hypothesis

As there has been previous research into the affects of organisation on memory I will do a 1 tailed hypothesis.

∴ People will remember more words from an organised list of words than from a disorganised,

Null hypothesis

∴ There will be no difference between the number of words recalled from the organised list compared with the disorganised list. Any difference will be due to chance.

Method

Design

For this type of study into memory I will use an experimental method in the style of a laboratory experiment because I feel it is the most suitable method. It allows the precise control of variables and enables it to be replicated easily.

It is the aim of this study to find out which variables are responsible for affecting memory. Its is only by the experimental method we can alter and control these variables.

The design will be independent measures, which means that it consists of 2 groups of different individuals

Therefore it is an independent measures design because we will obviously need 2 separate groups of individuals - those who do the organised list and those who do the disorganised. The task takes place in the recreational centre in the college. This is in the participants own settings rather than in a laboratory. This should reduce the stress and pressure of the situation and promote natural behaviour.

Variables

The variables are controlled - whether the participant is given the organised list or the disorganised list to memorize.

.. Independent variable

The independent variable is the factor which I have manipulated and controlled. In this case it is whether the list of words is organized into categories or whether it is disorganized.

.. Dependant variable

The dependant variable is what is affected by the independent variable, it is also measurable. This is how successfully people remember. I can measure the dependent variable by recording how many words are recalled.

*The two lists contain the same words, Universal words were chosen for the lists so that no one would have any expertise or advantage over anyone else. The theme of food is a universal topic that everyone has certain degree of knowledge about, less obvious 'everyday' foods were also used to prevent people simply guessing at common foods.

Sample and Participants

In order to conduct my research I will need some people to study. The participants used are called a sample. The type of sample I have chosen to use is called an opportunity sample. This means that I will use anyone that is available at the time the experiment is conducted providing they are over the age of 16.

I chose this method because it is the most convenient; I will study a total of 40 people. 20 will do the organised list (consisting of 10 male and 10 female) and the other 20 will do the disorganised list (also consisting of 10 male and 10 female). The participants will all be students of Stafford College, therefore should be of similar ages and social background.

Apparatus

.. Organized list - Appendix 2

- .. Disorganized list - Appendix 3
- .. Blank paper
- .. Pen
- .. Stopwatch

Ethics

- .. Participants must be over 16 years of age.
- .. Participants should give informed consent to take part.
- .. Confidentiality is of the utmost importance - no names will be recorded
- .. Subjects are free to withdrawn from the study at any point, even after it has been completed they can request their results are not used.
- .. To avoid any psychological harm or damage to self-esteem, participants should be praised and thanked for taking part.
- .. Subjects will be fully debriefed to the true nature of the study after completion.

Procedure

The study is carried out in the recreational area of a college. Myself and my fellow researcher will approach students and by following the standard instructions (Appendix 4) will ask them if they would mind participating in the study. If they agree then they will be provided with either an organised list or a disorganised list of words to memorise.

The participants are given 2 minutes to study the list of words, this is then taken off them and another 2 minutes is given for them to free recall and write down as many words as they can remember on a blank piece of paper.

When this time is up each participant is fully debriefed. Each potential participant is approached addressed & debriefed the same way using the prepared standardized instructions (appendix 4)

This is so that what I say to each person doesn't have an influence on their behaviour or their ability to recall data.

Controls

All variables excluding the independent variable must be controlled and kept consistent for each participant. This will ensure the results obtained are as accurate and reliable as possible.

- .. Each participant is given the same duration to memorize and recall the data, namely 2 minutes
- .. The task will be carried out in the recreational area of the college for each participant.
- .. The researcher will communicate with the participant using the prepared standardized instructions so all participants are treated the same.
- .. Each participant will be debriefed and thanked in the same manner using the standardized instructions.

Table of Results

The tables below show the number of words recalled by each participant for both the organized and disorganized list.

Organized List Disorganized List

Participant No.	Words recalled	Participant No.	Words recalled
1	16	1	6
2	16	2	6
3	17	3	7
4	14	4	7
5	17	5	5
6	15	6	6
7	14	7	6
8	16	8	5
9	15	9	6
10	16	10	7
11	16	11	6
12	12	12	5
13	15	13	6
14	16	14	4
15	14	15	5
16	17	16	7
17	14	17	6
18	13	18	7
19	18	19	7

20	16	20	6

Measures of Central Tendency

	Organized List	Disorganized List
Mean	15.35	6
Median	16	6
Mode	16	6
Range	6	3

15.35

$\frac{3}{4} = 0.697 * 100 \setminus 70\%$ is the average number of words recalled from the organized list.

22

6

$\frac{3}{4} = 0.272 * 100 \setminus 27\%$ is the average number of words recalled from the disorganized list.

22

Results Analysis

The results displayed in the table clearly show that when words are arranged in an organized structure it does improve memory and the ability to store and recall information.

The average number of words recalled from the organized list is 15.35, that's 70% of all the words recalled. Whereas the list arranged in a random order only recalled an average of 6 words, that's only 27% of the total words recalled.

These figures show what an obvious effect organization imposes on memory. It seems to apparently increase memory capacity.

Short-term memory has a limited capacity of approximately 7 ± 2 slots of information. This is supported by the fact that an average of 6 words were recalled from the disorganized list.

However an average of 15 words were recalled from the disorganized list, this is much more data than can be stored in short term memory. This is evidence that a process called 'chunking' took place. Chunking is a process which involves relating and combining information to knowledge already stored in long term memory. This apparently increases the capacity of short term memory by giving data a structure and meaning it did not already process therefore increasing the size of a meaningful chunk. So although we only have the ability to store 7 ± 2 slots of information in STM, A slot can be very large.

In the case of the organized list, chunking would most likely occur by relating and combining the information into the already structured groups of salads, fruits and vegetables.

From the results I have obtained I can confidently conclude that my hypothesis can be accepted that a greater number of words are indeed recalled from an organized list compared with the same list of words in a random order.

I can therefore reject my null hypothesis that the results produced were not due to chance but due to the structure that organization imposes.

Discussion

.. Implications of the study

My results support the hypothesis that people do indeed recall more words from an organized list than from a disorganized list. The average number of words recalled from the organized list was 15.35 compared to just 6 from the disorganized list, so this is clearly true.

My study was based on a previous study by Bowers in 1969; The results I produced are comparable to those obtained by Bowers.

Table comparing the result of my study and Bowers study

	My Study		Bowers Study	
	Average words recalled	% of Words	Average words recalled	% of Words
Organized	16.35	70%	16.9	65%
Disorganized	6	27%	4.94	19%

The results are quite similar although my results have a higher percentage of words recalled for both the organized and disorganized list compared to Bowers results, however it must be taken into account that more words were involved in Bowers list: - 26 compared to the 22 words used on my list. This will have an affect on memory as the participant is challenged to remember more words. Also different themes were used, Bower used that of minerals

Whereas mine involved food. This could affect the ability to recall especially if some of Bowers' participants had more specialized knowledge then others, the same can be said for the theme of food.

With these factors in mind, on the whole my results are similar to those obtained by Bowers. This dissertation from

.. Validity

The study does show that organisation can aid how effectively we remember data and can be regarded as accurate and reliable. However the experimental method that was used lacks

in ecological validity. Although the study took place in a recreational area, so therefore in the participants own settings, it is not however a natural everyday scenario to need to remember words in this manner, it is an artificial situation. Apart from these factors I did attempt to make the test as valid as possible. For example I tried to use everyday universal words that people would be familiar with and no one would have any particular advantage or knowledge over anyone else. Also I tried to make the variables as clear as possible because variables can affect peoples memory ie. - Whether they are given the organised or disorganised list, However it is crucial that they weren't told what the list is as it'd give the participant some insight into the true nature of the experiment and give them an advantage. Overall, I think that my study is a good representation of the affect organisation has on memory.

.. Improving Validity

To improve the validity of this research it needs to be performed in a more realistic scenario, an idea of this would be to change the method to make it more valid. I could do this by doing my research in the form of exam revision so it would be more like a field experiment. I could do this by creating a situation in which 2 groups are given one week to study for a small test. One group is encouraged to revise using an organised method, structured into categories and subheadings, whereas the other group are left to their own methods.

Another idea is to use the same method used by Rubin and Olsen. They tried to create a valid test by asking university students to recall professor and they subjects they taught by giving one group an organised list to study and the other a list in random order.

.. Reliability

I used the experimental method in the style of a laboratory experiment. This method is usually very reliable and accurate as it allows manipulation and full control over the variables (i.e. Whether the participant is given the organized or disorganized list) I can be fairly sure that if I repeated my research I would get very similar results to what I have obtained.

I had strict controls and kept factors constant, such as time to memorize and recall, this should ensure that results recorded are accurate. I also used a set of standardized instructions and procedure which I followed when asking a student to participate, this was to make sure that what I said to each person didn't have any effect on their ability to recall words. However, the sampling method used called opportunity sampling can be seen as biased because the researcher chooses who to take part and who doesn't.

.. Improving Reliability

To improve reliability I could have used the sampling technique of 'matched groups'. This consists of 2 groups of people which are matched by age gender background etc. i.e. - for every person there is someone to match them in the opposite group,

Also I could use a wider range of participants of different ages and people from different parts of the country (they would still need to be matched for the other group)

Also I could test a larger number of people than 20 per list.

.. Generalization of Findings

A generalization could be made from my results that organization does indeed prove to increase the capacity of memory and the ability to recall. However it needs to be taken into account that the study was conducted in one small area and participants were all students of similar age and social background, so it can be argued that it is unreasonable and inaccurate to generalize and apply the results to everyone. For example, it would not be reasonable to apply the results of a small select group of young adults to the older generation.

The study on the whole was not a natural scenario so it isn't reasonable to conclude that it is how people would behave in real life.

.. Application to Everyday Life

This study could be applied to help people in everyday life. Some ideas of how it could be used is to aid in exam revision for example, by revising from notes arranged in an organised manner should organize the data in the brain and promote better recall in exams and therefore better exam results.

Another idea is that it could help people with learning difficulties, if they learn from material arranged in an organized and structured format using subheadings etc it will give it a structure and meaning it did not already have and it should be easier to learn and store the information.