

Psychology

Chunking

Abstract

In this report I have investigated Miller's chunking theory and whether that increases the amount of information that can be stored in the short term memory. The aim of this experiment is to investigate whether chunking does improve the amount of memory the short term memory can hold. The hypothesis is in a test of short term memory recall involving 10 participants who had to remember and recall 5 chunked mobile phone numbers and 5 un-chunked mobile phone numbers. Participants who used the chunking method will score higher than participants who didn't use the chunking method. My research method is an experiment. I was able to accept my hypothesis and as a result I can say that Ebbinghaus was in fact wrong in saying that the short term memory can only hold six or seven pieces of information because with the chunking method it can hold more than that. So Miller was right the short term memory can hold 7 ± 2 pieces of information. Generally people find information easier to remember if it is in smaller chunks rather than great streams of information.

Background information

Erika Cox wrote that memory has three main processes. Registration is where the sense organs identify information and enter it into the memory system.

Storage is the process by which information is kept in the memory and finally

retrieval is the process by which information in memory can be recovered.

Atkinson and Shiffrin (1968,1971) developed the multi-store memory model. This is made up of the sensory memory, short term memory and long term memory.

Firstly information is detected by the senses and entered into the sensory memory and can be kept here if rehearsed. If we attend to this information it is then entered into the short term memory which According to Miller can hold 7 ± 2 items and can hold the information unrehearsed for up to 30 seconds. If that information is then rehearsed it can then be entered into the long term memory. If rehearsal does not occur than the information is forgotten

Long before Atkinson and Shiffrin developed the multi-store memory modal Ebbinghaus (1885) maintained that the short term memory is limited to six or seven pieces of information.

Miller (1956) disagreed with this. He developed a chunking method. Miller having reviewed earlier studies of the short term memory said that it could hold 7 ± 2 pieces of information. So Miller said that it can hold between five and nine pieces of information. The short term memory can hold a certain number of slots in which items can be stored. Miller suggested that the amount of information held in each slot could be increased by chunking the information.

For example if you had this set of letters – QPALZMWOSKXNEID – Miller would say that 15 letters is too much for the 7 ± 2 slots of short term memory to hold. But if we chunk the letters into smaller groups – QPA LZM WOS KXN EID – it gives five chunks of information which is within the range of the short term memory.

In summary Atkinson and Shiffrin (1968,1971) introduced the idea of the multi-store memory modal with its three main processes. Much earlier than this Ebbinghaus discovered that the short term memory could hold six or seven

pieces of information. Miller said the short term memory could hold 7 ± 2 pieces of information and took this further to say that the short term memory could hold more items of information if that information had been chunked. So Miller disagreed with Ebbinghaus's earlier idea that the short term memory could only hold six or seven pieces of information.

The **aim** of this experiment is to see whether chunking does improve the amount of information the short term memory can hold. In this investigation I am supporting Miller's theory of the chunking method.

The **hypothesis** is that participants will recall more information using the chunking method than without the chunking method.

The hypothesis is in a test of short term memory recall involving 10 participants who had to remember and recall 5 chunked mobile phone numbers and 5 un-chunked mobile phone numbers. Participants who used the chunking method will score higher than participants who didn't use the chunking method.

The null hypothesis is in a test of short term memory recall involving 10 participants who had to remember and recall 5 chunked mobile phone numbers and 5 un-chunked mobile phone numbers. Participants who didn't use the chunking method will score higher than participants who did use the chunking method.

Method

Design

The nature of my research is an experiment.

The independent variable is whether the mobile numbers are chunked or un chunked. Chunked means that the mobile numbers will be read out in smaller groups rather than all eleven numbers at once. So I will be reading the numbers out in 1 group of 5 and 2 groups of 3. There will be slight pauses in between each group of numbers. Un-chunked means that the numbers will simply be read out without any breaks in between each number. The dependant variable is how much of the mobile number is recalled in the right order.

The extraneous variable is that when I read the numbers out to the participants my voice might change pitch between each participant. I might not be able to keep exactly the same amount of time between each number as I read them. I will control this by recording my voice speaking all 10 chunked and un chunked numbers and then playing this recording back to each participant. They will all hear the same recording which means there will be no change in pitch, tone of voice and time in between each number.

Participants

The target population is 16-18 year old students studying A levels. The sampling method I will be using is opportunity sampling which means that the sample is selected on the basis of who is available at the time of testing and willing to take part. I am using this sampling method because it is the quickest and easiest way to take a sample. I will simply ask people who are available to do my experiment. I will use this sampling method because it is convenient, low cost and fits my situation as I am doing a school coursework experiment not an official experiment.

Task and Materials

Materials I will need for my experiment are:

- ✓ 1 pen – For me to record results on my record sheet
- ✓ Record sheet – For me to record the results
- ✓ Tape recorder – To record and play back my voice speaking the mobile phone numbers.

The participants have the task of recalling 11 digit mobile phone numbers. 5 of these mobile phone numbers will be chunked and another 5 will be un-chunked. They have to listen to the voice recording of the mobile phone numbers being read out one at a time and then try and recall the numbers in the correct order aloud after each one is read out.

Procedure

Each participant was sat down on a bench in an empty patio outside. This was the only available space to conduct my experiment where there were no other people. I then briefed the participant on what they would have to do in the experiment. Participants were assured of confidentiality, see briefing in appendix. I then began the test by first playing the 5 un-chunked numbers one after the other with gaps in between each mobile number so the participants could say their answers. Then I played the chunked numbers one after the other with gaps in between each mobile number so the participant could say their answers. I wrote down their answers as they said them. At the end of the test I thanked the participant and asked them if they had any questions. After that they were free to go.

Confidentiality – Before each participant does the experiment I will explain that their results will be taken attached to their results. I will also say that if at any time they decide to withdraw from the forward in confidence and none of their

personal details e.g. name, date of birth, will be at experiment then they can do so and their results will be destroyed.

There was an ethical brief and debrief before and after my experiment. The wording for the brief and debrief can be found in the appendix along with instructions for the task.

Results

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The two line graphs display the results of the chunked and un-chunked mobile phone numbers. As shown on average the chunked results show a higher amount of correctly recalled digits than the un-chunked. The mean score for un-chunked results was 21.3 and the mean score for chunked results was 25.5. Therefore the chunking method was more successful. Although participant 2 scored better in the un-chunked mobile phone numbers than the chunked but this could be down to boredom or loss of concentration as the chunked numbers were done second.

My hypothesis can be accepted there was a better level of recall when the numbers were chunked rather than un-chunked. So I succeeded in my aim of investigating whether chunking can improve the amount of information the short term memory can hold and found that it does. I have supported Miller's theory. My results prove Ebbinghaus was wrong with his idea that the short term memory could only hold six or seven pieces of information as some of the participants in my experiment held more than that. My experiment also supports Atkinson and Shiffrin's idea that information is not rehearsed then it is forgotten.

Summary and Conclusions

My research could be taken on and used in the real world. For example

A limitation of my experiment was that I only tested British people between the age of 16-18. Therefore my results haven't got a very broad variety of different ages or cultures and are not very representative. These results only represent a very small group of people.

I could have improved my experiment by drawing from a wider variety of different people. Testing people of all different ages and ethnic persuasions would have

given me a broader and more representative set of results.

Further research you could carry out following my experiment is whether recall was better when hearing a recording of a woman's voice as opposed to a man's voice. This would be interesting research as participants 1,2,4,5 and 10 on average got lower scores on both chunked and un-chunked than participants 3,6,7,8, and 9. Participants 1,2,4,5 and 10 were male and participants 3,6,7,8 and 9 were female. So on average the girls got higher test results than the boys. Maybe this was because the girls found listening to a man's voice more appealing and therefore found it easier to remain focused. Maybe the male participants found the man's voice less appealing as opposed to a woman's voice and therefore found it more difficult to remain focused. So would the male participants overall recall improve and the females recall overall deteriorate if it was a recording of a woman's voice?

References

- AS Level Psychology for AQA specification B - Erica Cox.
- Psychology, The science of the mind and behaviour, Fourth edition – Richard Gross.

Appendices:

Brief

Thank you for agreeing to take part in my experiment. It is a simple memory test on mobile phone numbers. I will play you a voice recording of ten different 11 digit mobile phone numbers. After each mobile phone number is played there will be a pause for you to recall and speak as much of the mobile phone number as you can remember. I will then record your results on this sheet. No personal details will be attached to your results and they will be treated with strict

confidentiality. If at any time during the test you would like to withdraw from the experiment you can do so and your results will be destroyed.

Instructions

You will hear ten 11 digit mobile phone numbers one after the other. In between each mobile phone number I will stop the tape to give you time to recall and speak as many of the digits you can remember in the correct order. As you speak the digits I will record your results onto a results sheet. When I have finished writing your results down I will restart the tape and the next mobile phone number will be played.

Debrief

Thank you for taking part in my experiment. Do you have any questions?