Invent Yourself Short-Term Memory

Team Romania

What is Short term memory?

- Short-Term memory (or "essential" or "dynamic memory"), referred from here on out as STM, is the limit with regards to holding, however not controlling, a little measure of data as a top priority in a functioning, promptly accessible state for a brief timeframe. For instance, Short-Term memory can be utilized to recall a telephone number that has quite recently been presented.

What are the limits of STM?

- Short-Term memory is believed to be somewhere around 20-30 seconds, and able to retain anywhere from 5-7 items at once, however in order to prove this we have asked 100 healthy people to complete a couple of simple tasks to see their STM at work.

How did we run our experiment?

- We wrote a game in C++ which showed our participants a number for 5 seconds, then asked them to re-write that number as fast as they could. Going into a little depth on how it was done, we had a C++ program packed in with an executable that had some code for GET requests which were redirected to a simple Apache/PHP server and stored everything nicely in a MySQL database.
- We tested 150 students with the code we wrote.
- They were given 7 numbers (with the number of digits 3 – 9) and given 5 seconds to learn it and then rewrite it.
- We implemented anti-cheats to prevent anyone from cheating, so the results are very accurate.

Things of note:

- We considered anything faster than 1 second to be cheating, which while not entirely true for small numbers, it's very accurate at over 5 digits
- 5 different classes of 30 students each were tested.
- They were all given the same numbers to avoid luck by randomness
- We added at 8 digits a number that is very easy to remember to see if the brain uses some kind of compression to store data. (which will be further elaborated)

What are we predicting?

- We believe that percentages for the first couple of numbers will be high, then they will drop, soar at 8 digits, and be decimated at 9 digits.
- We have tested students from the mathematics, science and philosophy field. We expect the results to be highest for the philosophy students.

What are the results?

Factors that we have observed

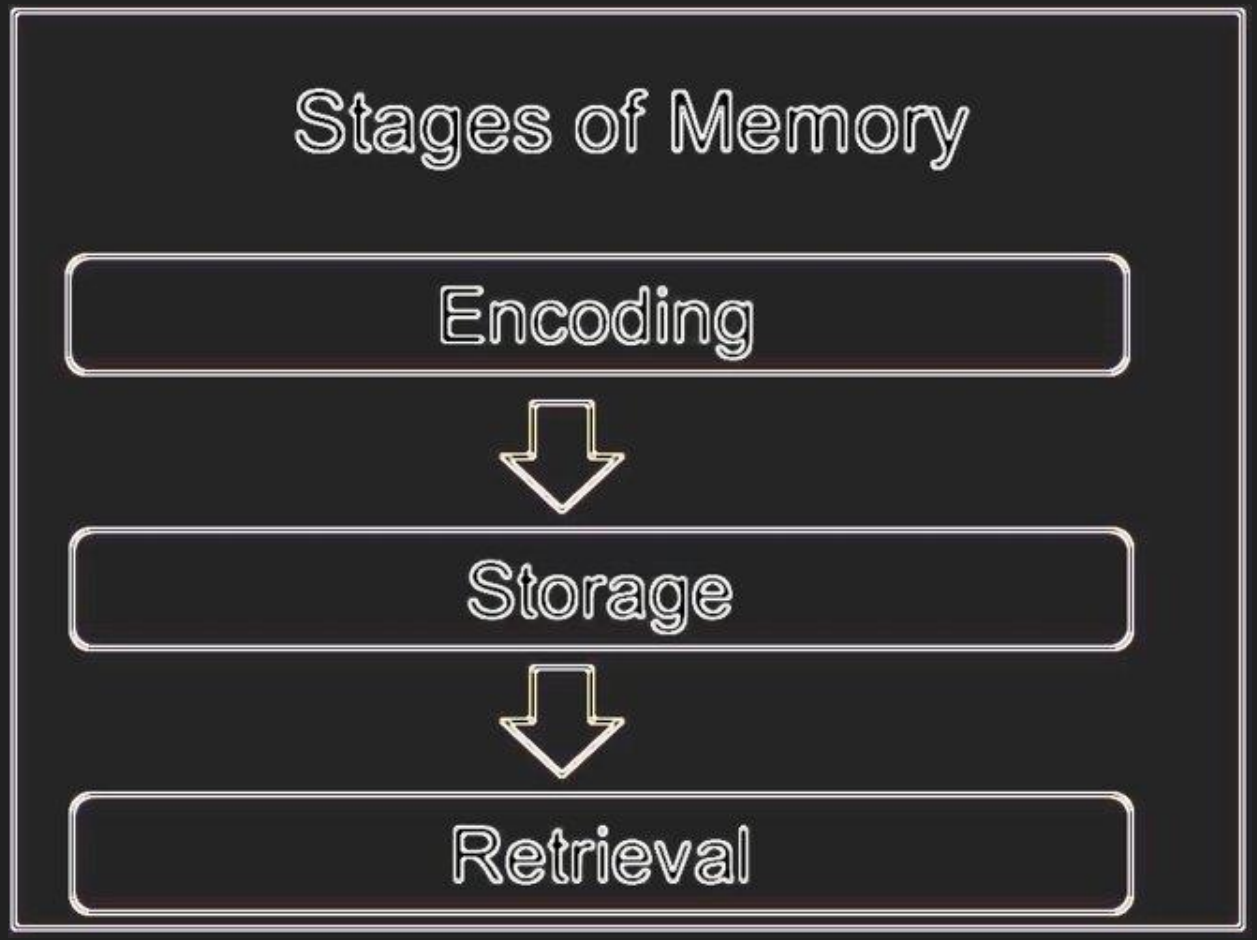
- The philosophy students scored highest as predicted. We believe this is the case due to their brain being constantly subjected to small bits of information which further supports the ideea that the brain can be stimulated to learn these things.
- Noise is also important. In a separate test we took the same participant in a different day, and tested him in a noisy environment, and a quiet one. It should be noted he performed better in the latter.

Compression mechanisms

- Chunking is one of the many compression mechanisms that the brain often uses to optimise the STM it has available. Chunking is where the required sequence is split into numerous chunks, which are easy to remember and are then combined toghether to create the original sequence

123 456 789

How does STM work?



References

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- http://columbianeuroresearch.org/sergievsky/pdfs/agingandmemoryinhumans.pdf

Thank you