Short-Term Working Memory: Techniques and Influencing Factors

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Introduction
- Short-term working memory tests
- Factors influencing memory: artistic background, level of physical activity, amount of sleep, biological (gender)
  - Brain regions involved in music processing are also required for other tasks, such as memory or language skills.
  - Prior studies performed on rats have shown a positive correlation between exercise and memory.
  - Lack of quality sleep negatively impacts our short-term memory because the "brain's ability to store memory during waking hours is reduced and information isn't retained long enough."
- Males comprehend material better than females when recalling and answering questions about data
- Individuals utilize certain memorization techniques depending on the type of test given
  - Hypothesis: Acrostic or association method is preferred for the word test, chunking for the number test, and visualization for the picture test.

Research Questions:
- Which method was used most often/least often for each test?
- Which method was most/least helpful for each test?
- What are the relationships between memory and memory, gender, and lifestyle?

Memorization Techniques
- Mnemonic/Acrostic: An invented sentence or poem with a first letter cue: The first letter of each word is a cue to an idea: Please Excuse My Dear Aunt Sally (FEMDAS)
- Rehearsal: A method of learning through repetition; benefit of being able to quickly recall an item shortly after seeing it.
- Chunking: Taking individual items and grouping them into larger units; e.g. chunking telephone area codes: 773 847 312708 → 773 847 3127 08.
- Visualization: Using your imagination to create vivid images of items; e.g. visualizing the memory test
- Association: Mentally associating items to each other
- Method of loci: Each location serves as a hook, to which you visually connect whatever you want to remember to an image/scene.
- Combination: Any combination of the above-listed methods

Procedure
1. Three tests were created and administered – a randomly generated list of words, numbers, and pictures.
2. Convenience sampling: FYRE students living in Simpson Floor 2 who were willing to participate in the study.
3. Each test was administered on a different day, specifically to see if the amount of sleep affected the scores.
4. Participant was given thirty seconds to memorize the test and, immediately after, a minute to recall (write down) everything he/she remembered.
5. After the test, we asked a short series of questions pertaining to the participant’s background: any history of neuropsychological issues, any history of psychiatric issues.
6. After each test, the data was analyzed for trends and relationships.

Word Test
- Most commonly used methods: rehearsal and chunking
- Highest-scoring methods: visualization and association
- The method of loci also received high scores, but because only a couple people used this method it cannot be said with confidence how well this method works overall.

Number Test
- Most commonly used method: chunking and rehearsal
- Highest-scoring methods: association and visualization
- However, only a small handful of students utilized them

Picture Test
- Most commonly used methods: rehearsal and visualization
- Highest-scoring methods: chunking and rehearsal
- People who used the method of loci and acrostic method scored well, but only a small handful utilized these methods

Conclusion
- Hypothesis disproven
  - No correlation between memory and arts involvement, physical activity, and sleep
  - Females scored higher on average
  - Rehearsal alone → less advantageous for short-term memory
  - Association and visualization help remember more effectively
  - Relate something to what we already know; conceptualize image
  - Combination of methods may prove to be more beneficial than one alone
- Future research
  - Gender and memory
  - More extensive experiment with random sampling
  - Neuropathology: which part(s) of the brain is involved in different type of tests
  - Factors influencing memory vs. long-term memory
  - Miller’s Law → Why picture test exceeded expectations

References