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A Comparative Study on the Effect of Context on Retrieval Between Adolescent Boys and Adolescent Girls

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Abstract

This comparative study delves into the nuanced ways contextual factors impact information retrieval among adolescent boys and girls. The aim is to analyse cognitive processes, memory, and learning preferences unique to each gender. By examining how they navigate and recall information within different contexts, the research aims to contribute valuable insights for educators and policymakers, potentially leading to tailored strategies for cognitive development and education based on gender-specific needs. The sample of the study consists of 30 adolescents (from ages 11-19 years), out of whom 15 were males and 15 were females, who were all literate and free of any psychological ailments. The data was collected using standardised Context and Retrieval Test which consists of 18 cards with an incomplete sentence enclosed in a box and two words printed on the top right and top left corners, out of which one is the context word, and the other is non-contextual. After the samples were collected, the mean percentage of recall of both, contextual and non-contextual words was calculated and compared between the genders. The results showed significant difference between the recall of context words of males and females. It was observed that the recall of contextual words was higher than that of non-contextual words in both genders. It was also noted that the recall of context words was higher in females as compared to males. Context plays a crucial role in retrieval because it provides a framework for organizing and associating information in our memory.

KEYWORDS - Context, Retrieval, Adolescents

Introduction

When we acquire new information or learn we do so in a particular context. Not only while learning, but also when the learnt material is retrieved context plays an important role. Experiments conducted by Estes (1972) show that it is easier to retrieve a particular episode if you are in the same context in which you have encoded it. For example, to retrieve the names of persons who came for your birthday party three years ago, if you can go back in your imagination to that day and where it occurred you would be able to recollect better.

Similarly, your ability to retrieve; say an emotional moment with your grandparent would be greater if you were back in the place where the incident occurred. This may explain why we are sometimes overcome with a torrent of memories about our earlier life when we visit place we once lived. The context in which an event was encoded is itself one of the most powerful retrieval cues. Context is not

always external to the memorizer, such as a physical location or specific face. What is happening inside of us when we encode information - our internal state also becomes part of the context?

Eich et al. (1975), who conducted experiments related to this suggested that memory improves considerably when our internal sates during retrieval matches that during encoding. For example, if one experiences an event while under the influence of a particular drug (say alcohol or marijuana) perhaps he can best retrieve it when he is again in that drug - induced state, in such cases memory would partly dependent on the internal state during learning, this is called state dependent retrieval". Thus, the factor of contextual effect on learning is a significant one. Today, linguists, educators and psychologists make a considerable effort in creating a congenial context while teaching language, skills and other useful information so as to make the learning more effective.

Related Research Work

J. O. Edgin, G. Spano, K. Kawa, and L. Nadel (2015), Remembering things without context: Development matters. Context provides a scaffold for memories, facilitating encoding and serving as a cue for retrieval. In adults, spatial context supports memory retrieval. Context effects on object recognition were investigated in neuro-typical children aged 3 to maturity and in adults with Down syndrome aged 10 to 29 years to understand the evolution of these effects. Participants were given an object recognition task. Despite poor object recognition, some groups showed context effects. Children showed memory flexibility at 4.5 years, but context effects reappeared later in adolescence, indicating nonlinearity in the development of these effects.

Karl-Heinz T. Bauml (2019), Context Retrieval as a Critical Component in Selective Memory Retrieval. Retrieval-induced forgetting is the term used to describe how selective retrieval often impairs memory of non-retrieved objects. The concept of context retrieval, which has been extensively studied in other areas of memory research, postulates that selective retrieval can reactivate the retrieved items' temporal context during study, facilitating recall of other items that had a similar context at study. There may be a connection between the reminding literature and these facilitator effects on recall since they can occur when selective item repetition happens through retrieval as well as restudy. The findings provide new perspectives for investigating and understanding the effects of selective memory retrieval.

Thomas C. Lorsbach, Jason F. Reimer, Mary J. Friehe, Joseph J. Armendarez, and Amy Fair Teten (2015), Controlled Retrieval of Specific Context Information in Children and Adults This study adapted a procedure used by Luo and Craik (2009) to examine whether developmental differences exist in the ability to use controlled retrieval processes to access the contextual details of memory representations. Participants from 3 different age groups were presented with words in 3 study contexts and six recognition tests were then presented that varied in the demands (high or low) placed on the retrieval of specific contextual information. A high-specificity and a low-specificity test list were paired with each test question, with high and low specificity being determined by the nature of the distractors used in a test list. Relative to low-specificity tests, the retrieval conditions of high-specificity tests were assumed to place greater demands on the controlled access of specific contextual information. Analysis of recollection scores revealed that age differences were present on high but not low-specificity tests, with the performance of 9-year-olds disproportionately affected by the retrieval demands of high-specificity tests.

Joel L. Voss, Jonathan T. O'Neil, Maria Kharitonova, Margaret J. Briggs-Gowan, and Lauren S. Wakschlag (2015), Adolescent development of context-dependent stimulus-reward association memory

and its neural correlates expression of learned stimulus-reward associations based on context is essential for regulation of behaviour to meet situational demands. Contextual regulation improves during development, although the developmental progression of relevant neural and cognitive processes is not fully specified. We therefore measured neural correlates of flexible, contextual expression of stimulus-reward associations in pre/early adolescent children and young adults. Subjects were required to respond according to original stimulus-reward associations vs. reversed associations based on trial-specific contextual cues. Children and young adults did not differ in reinforcement learning or in relevant functional magnetic resonance imaging correlates. In contrast, adults outperformed children during contextual reversal, with better performance specifically for inconsistent trials. fMRI signals corresponding to this selective advantage included greater activity in lateral prefrontal cortex (LPFC), and hippocampus for young adults relative to children. Flexible expression of stimulus-reward associations based on context thus improves via adolescent development, as do recruitment of brain regions involved in reward learning and contextual expression of memory.

Purpose of the Study

The purpose of the study on the effects of context on retrieval is to understand how environmental factors influence memory recall. This research sheds light on the cognitive mechanisms involved in information retrieval, which may aid researchers, psychologists, and educators in creating more potent teaching and learning strategies. We can enhance instructional strategies, improve training curriculum, and establish settings that promote greater information retention and application by understanding how context affects memory.

Furthermore, the practical applications of this information include curriculum development, memory enhancement strategies, and educational material design, all of which lead to more effective and customised learning experiences.

Research Methods

Problem

To study the effect of context on retrieval of information

Variables

- Independent Variable: context (the fill in the blank sentences)
- Dependent variable: retrieval (recall of context words)

Hypothesis

Ha: There will be significant difference on the effect of context on retrieval between adolescent males and females, with the recall being higher in females.

Materials Required

- A set of 18 cards/slides having incomplete sentences with context and non-context words.
- Stopwatch (lab).
- Intervening task (arithmetic test)

Description of the Material

Each card/slide has an incomplete sentence enclosed in a box. There will be two words printed on top right and top left corners, out of which one will be the context word and the other will be a non-context word.

Sample

The sample consists of a total of 30 subjects, 15 boys and 15 girls. The subjects are adolescents between ages 10-19 years, all of whom are students residing in Hyderabad, India. In this study, Simple Random Sampling Techniques is used for collecting data.

Procedure

The subject is seated comfortably, and the following instructions are given" I will present to few cards/slides one after the other for a very brief period of time You will see a sentence on each card/slide enclosed in a box and words printed on top of fit. Observe the card carefully".

Each card was presented for 8 seconds and after presenting all the cards an intervening task (an arithmetic sheet) was given to the subject for about two minutes. Later, the subject is asked to recall the words and the experimenter notes them (for 5-8 minutes).

(In a digital mode, the power point presentation is used.)

Precautions

- Cards/slides were presented randomly.
- Ready (audio tone in-case of digital: mode) signal was given before presenting each card.
- Sentences and words were clearly written.

Results

1. The number of context and non-context words was counted, and percentages will be calculated.
2. Table 1 showing the number of context words and non-context words.
3. Table 2 showing the mean of context words and non-context words.
4. Table 3 showing the mean percentage of context words and non-context words.
5. Graph is plotted showing the mean percentage of context words and non-context words.

Table 1 Showing the Number of Context Words and Non-Context Words.

	Females	Males
Contextual Words	101	66
Non-contextual Words	43	47

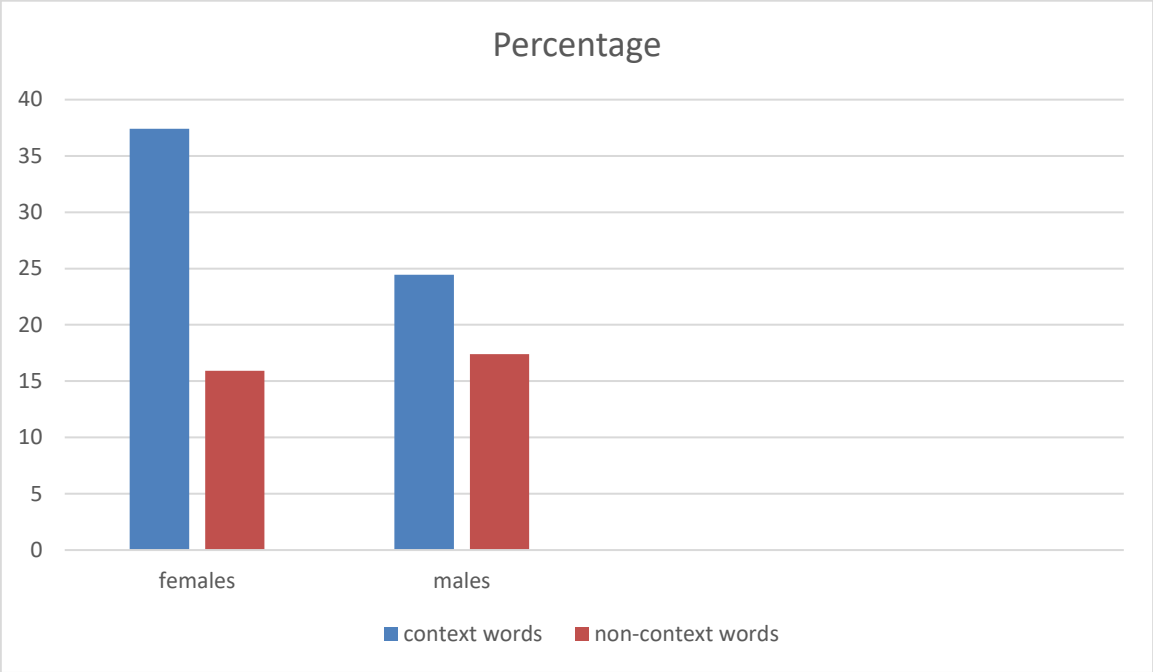
Table 2 Showing the Mean of Context Words and Non-Context Words.

Words	Females	Males
Contextual Words	0.3740	0.2444
Non-contextual Words	0.1592	0.1740

Table 3 Showing the Mean Percentage of Context Words and Non-Context Words.

Words	Females	Males
Contextual Words	37.40%	24.44%
Non-contextual Words	15.92%	17.40%

Figure 1 Graph Showing the Mean Percentage of Context Words and Non-Context Words



Discussion

From table 1 it was found that the number of contextual words recalled was 101 in females while it was 66 in males and the number of non-contextual words recalled was found to be 43 in females and 47 in males. The mean and mean percentage was then calculated, and the results are presented in Table 2 & 3. It can be noted that the mean of contextual words recalled was 0.3740 in females, while it was 0.2444 in males. The mean of non-contextual words recalled was found to be 0.1592 in females and 0.1740 in males respectively.

The mean percentage of contextual words recalled was 37.40% in females, while it was 24.44% in males. The mean percentage of non-contextual words recalled was found to be 15.92% in females and 17.40% in males respectively.

It appears from the results that the percentage of recall of contextual words for males is higher than that of non-contextual words by 7.04% and the percentage of recall of contextual words females is also higher than that of non-contextual words 21.48%. As we can see, females recalled more contextual words than males. However, it is interesting to note that males have a higher recall of non-contextual words when compared to females.

The results also indicate that the level of recall of contextual words was higher in females as compared to males by 12.96%. This shows that female adolescents have a higher retrieval rate to contextual words. However, the level of recall of non-contextual words was slightly higher in males as compared to females by 1.48%.

Conclusion

Context retrieval is a concept that has been fundamental to various memory research strands. It implies that selective retrieval can reactivate the chronological setting of the retrieved items during study, hence aiding recall of more information with similar study contexts. The study concludes that there is significant effect of context on retrieval. It has also been proven that the recall of contextual words was higher in females as compared to males.

In conclusion, this study found that context has a significant influence on memory retrieval in adolescents, with females demonstrating particularly strong contextual recall. This aligns with previous research suggesting female adolescents utilize more elaborate encoding and contextual processing strategies.

The hippocampus plays a key role in binding item and context information during encoding, and its accelerated development in pubescent females may account for their contextual memory advantages. Further research could investigate developmental differences in hippocampal structure and function to better understand the neural mechanisms underlying enhanced contextual retrieval in teenage girls.

These findings have important educational implications, highlighting the benefits that contextual learning strategies could confer on female students. Providing rich semantic and spatial contexts may help facilitate knowledge acquisition and retrieval in young women.

Practical Application

In education, understanding the effect of context on retrieval in adolescents can inform teaching methods. Tailoring lessons to include varied contexts or real-world scenarios can enhance memory recall for students. For example, incorporating practical applications in mathematics problems or historical events related to everyday experiences may improve learning outcomes by aligning with the context in which adolescents typically encounter information outside the classroom. This approach aims to optimize contextual cues, fostering better retention and application of knowledge among adolescents.

The context in which one initially encounters and learns information creates a mental setting that becomes linked to that information. When attempting to retrieve the information later, the context serves as cues, helping them recall details more effectively. This phenomenon, known as context-dependent memory, underscores the importance of considering the environment, circumstances, or situational factors during the encoding process for optimal retrieval outcomes.

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