



Full Length Research Article

GENDER DIFFERENCES IN SHORT TERM MEMORY AND PERCEPTION

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ABSTRACT

Memory and perception are valuable possessions of mankind. But these possessions are influenced by various physical, emotional and environmental factors. So, the present study planned to investigate the influence of gender on memory and perceptual ability. Results revealed that short term memory showed statistically significant increase in females compared to males. Perceptual ability showed an insignificant increase in males compared to females. Thus it could be concluded that women performed well in verbal episodic memory tasks and men excelled in visuo-spatial processing.

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INTRODUCTION

Memory is one of the admirable possessions of man. Memory can be defined as an internal repository of stored information which involves a set of processes like encoding, consolidation and retrieval ([http://www-psych.stanford.edu/~ashas/Cognition %20 Textbook/ chapter5.pdf](http://www-psych.stanford.edu/~ashas/Cognition%20Textbook/chapter5.pdf)) Life without memory is not possible for anyone to make a social living and such a life is unimaginable. Short term memory is the information retained in the brain that can be retrieved over a brief span of time. Short-term memory based events are forgotten quickly and they last for a maximum duration of an hour or two. It is controlled by the temporal lobe of the brain (Wong, 1997). Perception is the brain's process of organizing and interpreting sensory information and understanding its meaning. The brain processes and designates meanings of visual images from eyes by virtue of visual cognitive skills. This visual information processing is performed through the visual pathway from retina to the cerebral cortex (http://www.mheducation.ca/college/santrock/graphics/santrock1pcs_information/1pcs_sam ple.pdf).

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Many researchers have reported the influence of various factors like health, exhaustion, menstrual cycles, body temperature, alertness and stress tolerance on memory and perception (Bauer et al., 2002). However, scientific experiments studying the relationship between gender and perceptual capacity as well as memory and cognitive disorders were not reported much. To fill the lacunae the present study planned to investigate the effect of gender on short term memory and perceptual ability among student population.

Experimental procedure

Normal young and healthy male and female students (20 each) with the anthropometrically matched variables were chosen for this study from Sathyabama Dental College and Hospital, Jeppiaar Nagar, Rajiv Gandhi Road, Chennai. After explaining the experimental procedure and making the subjects fully aware of their role in the project, informed consent was obtained from them.

Short term memory task

To test the short-term memory of the subjects, we created an experiment in which the subject would be asked to recall a list of ten items. These items were non-gender specific, unrelated terms like bag, tree, computer, tooth brush, car, lamp, door, paper, etc.

Each person was given one minute to memorize the ten terms. Then they had one minute to recall the items they visualized and wrote them in a paper.

Table 1. List of items in short term memory task

lamp	shoe	dog
flower	camera	sun
ship	book	fish
bus	phone	Balloon
Bed	car	apple
tree	house	bear

Evaluation of Perceptual ability

The subjects were shown commercially available weirdomatic illusions in a computer screen in which the hidden object(s) varied in complexity. The subject was asked to identify the number of possible hidden images from the illusions and the rate at which they were identified. Based on their answers, scores were given.

Statistical Analysis

Data were expressed in mean \pm SEM and the changes in short term memory performance and perceptual capacity in both genders were analyzed using student t-test. Significance level was fixed at $p < 0.05$.

RESULTS AND DISCUSSION

Short term memory showed statistically significant increase in females compared to males. Perceptual ability showed an insignificant increase in males compared to females.

Impact of gender on changes in Short and Perceptual ability

Variables	Male (scores)	Female (scores)	p value
Short term memory	15.2 \pm 0.05	16.6 \pm 0.06	P =0.001789
Perceptual ability	10.42 \pm 0.07	9.54 \pm 0.06	P =0.130487

Values are expressed as mean \pm SEM. Units are measured as scores obtained.

The short term memory testing was based on verbal learning and vocabulary skill test. Our results showed that females were able to respond with a good short term memory. From an early age of 16 months, girls tend to outpace boys in their language development, demonstrating a larger vocabulary (study.com/academy/lesson/how-environmental-variables-other-factors-influence-perception.html; Bauer et al., 2002). This could be the possible reason for a better performance of female subjects.

It has been reported that women have been shown to outperform men on semantic tasks like verbal fluency and synonym-generation. The declarative term memory system is tied to semantic knowledge in women and has been localized to the hippocampus (Huttenlocher et al., 1991; Mishkin et al., 1984; Schacter and Tulving, 1994) whose function is known to be enhanced by estrogen (Squire and Knowlton, 2000). It has also been reported that women tend to rely on the declarative memory system for retrieving past-tense verb forms, while men tend to rely on the procedural memory for the same task (Steinhauer and Ullman, 2002).

In the present study, Females were more field dependent and showed slower responses to the identifying the possible number of hidden images from the illusions than males. Although females reported more prior experience with this form of art, males were about four times faster at identifying the illusions at all levels of difficulty. But the statistically insignificant changes in perceptual capacity may be due to the reason that the sample size chosen for the study was low. A larger sample size could allow for greater statistical power when stratifying a sample by gender. A larger sample size can increase confidence in data interpretation and decrease the possibility of Type I error. Thus it could be stated that women performed well in verbal episodic memory tasks, such as remembering words, objects, pictures or everyday events, and men excelled in remembering symbolic, non-linguistic information, known as visuo-spatial processing.

Conclusion

Females definitely have better short term memory than males. Therefore, it can be concluded that gender does play a role in the short term and perceptual ability.

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REFERENCES

- Bauer, D.J., Goldfield, B.A. and Reznik, J.S. 2002. Alternative approaches to analyzing individual differences in the rate of early vocabulary acquisition. *Applied Psycholinguistics*, 23:313–335.
- Doi.<http://study.com/academy/lesson/how-environmental-variables-other-factors-influence-perception.html>
- Encoding and retrieval from long term memory. Chapter 5. [http://www-psych.stanford.edu/~ashas/Cognition%20Textbook/chapter 5.pdf](http://www-psych.stanford.edu/~ashas/Cognition%20Textbook/chapter5.pdf)
- Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M., Lyons, T.1991. Early vocabulary growth: Relation to language input and gender. *Developmental Psychology*. 27:236–248.
- Mishkin, M., Malamut, B. and Bachevalier, J. 1984. Memories and habits: Two neural systems. In: Lynch G, McGaugh JL, Weinburger NW, editors. *Neurobiology of Learning and Memory*. New York: Guilford Press pp. 65–77.
- Schacter, D.L. and Tulving, E. 1994. editors. *Memory Systems*. Cambridge, MA: MIT Press.
- Sensation and perception.chapter 4 .Sanrock , PSYCHOLOGY. Doi.http://www.mheducation.ca/college/sanrock/graphics/santrock1pcs_information/1pcs_sample.pdf
- Squire, L.R., Knowlton, B.J.2000. The medial temporal lobe, the hippocampus, and the memory systems of the brain. In: Gazzaniga MS, editor. *The New Cognitive Neuroscience*.Cambride, MA: MIT Press; pp. 765–780.

Steinhauer, K. and Ullman, M.T. 2002. Consecutive ERP effects of morpho-phonology and morpho-syntax. *Brain and Language*.83:62–65.

Wong, C.W. Two circuits to convert short-term memory into long-term memory. *Medical Hypotheses* .Volume 49, Issue 5, November 1997, Pages 375–378. DOI: [http://dx.doi.org/10.1016/S0306-9877\(97\)90082-7](http://dx.doi.org/10.1016/S0306-9877(97)90082-7)
