

# Assessment of Short Term Memory by the Word and Object Test in Young Adults

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## ABSTRACT

Short term memory is highly vulnerable to distraction, requiring attention and vigilance to maintain the content. It is often tested at the bedside by asking the patient to recall several digits forward and backward.

**Materials and Method:** Fifty (50) young healthy adults age group of 17 to 24 years in Ajmer were randomly selected for this study (50 males and 50 females). In our study we have used free recall tasks of word and object. We have asked the subjects to recall the displayed words and pictures of objects. Number of correct items were measured. Descriptive statistics included computation of percentages, means and standard deviations. Level of significance was set at  $P \leq 0.05$ .

**Results:** The result of present study suggests that statistically decrease in short term memory status in higher tasks of test. Short term memory status for object test was significantly greater than word test. Statistically significant gender difference was observed in object test in which female having better short term memory. There was significant improvement in memory status after applying of memory enhancing methods in all subjects and more so in females.

**Conclusion:** In present study progressive decrease in memory status in higher tasks of word test is due to increase in number of items more than seven as an individual can hold 7+2 bits of information. In our study we have observed that females are having more short term memory for object test due to high attention, participation in tasks. Short term memory for object test was significantly higher than word test which may be due to good sight.

**Keywords:** Short term Memory, object test, word test.

## INTRODUCTION

Memory is the ability to recall past events at conscious or unconscious level. It is relatively permanent retention and storage of learned information<sup>1</sup>.

Memory is a complex function of the brain that has fascinated philosophers and scientists for centuries. Memory is currently viewed as a mental process using several storage buffers of differing capacity and

duration. Sensory memory lasts for about 250 ms in the visual mode (iconic memory) and 1 to 2 s in the auditory mode (echoic memory). Immediate (short-term or primary) memory has a duration of about half a minute and a limited capacity of approximately 5 to 10 items. Immediate memory is highly vulnerable to distraction, requiring attention and vigilance to maintain the content. It is often tested at the bedside by asking the

patient to recall several digits forward and backward. Recent, or secondary, memory has been called both "short-term" and "long-term." It has a duration of minutes to weeks and exhibits a larger storage capacity than immediate memory. On entering this buffer, the information undergoes a process of consolidation of variable duration. Recent memory is commonly tested in the clinical setting by asking a patient to recall three words after 3 to 5 minutes. Remote, or long-term, memory stores information lasting weeks to a lifetime and contains most of our personal experiences and knowledge. Some information appears to be stored accurately for an indefinite time, whereas other items fade or become distorted. Memory function includes registration (encoding or acquisition), retention (storage or consolidation), stabilization, and retrieval (decoding or recall). Registration and retrieval are conscious processes.<sup>2</sup>

Therefore the present study was undertaken to observe normal short term memory status in young adults.

## MATERIALS & METHODS

The present study was conducted in Department of Physiology, J.L.N. Medical College, Ajmer (Rajasthan). Fifty (50) young healthy adults of either gender of age group of 17 to 24 years in Ajmer were volunteers for this study.

In our study we use free recall task of words and pictures of objects in six sessions.

At the beginning we take their general Information Age, gender and do they have any neurological disorder or brain injury.

For testing short term memory of the subjects, we performed our study in three sessions.

In First session we displayed three words and picture of three objects was shown to subjects for 15 seconds.

In second session we displayed six words and picture of six objects was shown to subjects for 20 seconds.

In third session we displayed nine words and picture of nine objects was shown to subjects

for 30 seconds. Numbers of the correct items recalled were measured in percentage.

After 20 minutes of rest we used same tests which repeated with different sets of words and picture of objects after asking them to applying some standard methods for enhancing short term memory.

Firstly asked the subjects to make a groups of words (2 or 3) like a group of body parts for example eye, ear, lips etc. this is called grouping method which is used for enhancement of word test.

Now we used linking method for enhancement of object test. In which we asked the subject to link the objects with each other and try to recall better, for example the following objects- cup, ice cream, apple, chair, spoon links each other like a child take a cup of ice cream and spoon, apple on chair.

## STATISTICAL ANALYSIS

Descriptive statistics included computation of percentages, means and standard deviations. Level of significance was set at  $P \leq 0.05$ .

## RESULT

TABLE 1 MEMORY STATUS BEFORE AND AFTER APPLYING OF MEMORY ENHANCING METHODS IN WORD AND OBJECT TEST

	Before Mean + SD	After Mean + SD	t test, p value & significant
Word Test	72.79 ± 15.77	84.17 ± 12.51	t = 3.99, p value 0.0001 Highly Significant
Object Test	81.19 ± 12.54	88.51 ± 10.87	t = 3.118, p value 0.0024 Very Significant

In the above study while comparison of memory status before and after applying of memory enhancing methods in Word test it was found that in the results were highly significant, while in Object test the results were very significant in the present study.

TABLE 2 COMPARISON OF MEAN VALUES OF WORD TEST AND OBJECT TEST IN MALE AND FEMALE

	Word Test		Object Test	
	MS Mean ± SD	MSMEM Mean ± SD	MS Mean + SD	MSMEM Mean ± SD
Male	71.72 ± 16.02	81.35 ± 11.51	74.66 ± 10.36	82.11 ± 12.51
Female	73.86 ± 15.97	86.88 ± 13.07	87.73 ± 11.16	94.90 ± 6.20

The mean of memory status before applying of memory enhancing method in Word test was found to be in males  $71.72 \pm 16.02\%$  and in females  $73.86 \pm 15.97\%$ . The mean of memory status after applying of memory enhancing method in Word test was found to be in males  $81.35 \pm 11.15\%$  and in females  $86.88 \pm 13.07\%$ .

The mean of memory status before applying of memory enhancing method in Object test was found to be in males  $74.66 \pm 10.36\%$  and in females  $87.73 \pm 11.16\%$ . The mean of memory status after applying of memory enhancement method in Object test was found to be in males  $82.11 \pm 12.51\%$  and in females  $94.90 \pm 6.20\%$ .

## DISCUSSION

The result of present study suggests that statistically decrease in short term memory status in higher tasks of test. Short term memory status for object test was significantly greater than word test. Statistically significant gender difference was observed in object test in which female having better short term memory. There was significant improvement in memory status after applying of memory enhancing methods in all subjects and more so in females. Our study is supporting the research work of Zeba A et al. (2017)<sup>4</sup> the mean $\pm$ SEM of memory status in all the subjects was  $68.41 \pm 14.47\%$ . The memory status found to be less than object test, however this decreased memory status of words test was not significant statistically when compared to objects test.

Ansari S et al (2019)<sup>3</sup> found the memory status in all the subjects to be increased and was statistically highly significant ( $p < 0.001$ ) when compared to the memory status before application of memory improvement methods. The memory status in males was found to be increased which was statistically highly significant ( $p < 0.001$ ) when compared to memory status before application of memory improvement methods.

Limitations of Study: Our sample size was relatively small.

## CONCLUSION

In present study progressive decrease in memory status in higher tasks of word test is due to increase in number of items more than seven as an individual can hold  $7+2$  bits of information. In our study were have observed that females are having more short term memory for object test due to high attention, participation in tasks. Short term memory for object test was significantly higher than word test which may be due to good sight. More study is required to study the dimorphism of the brain to understand the reason for these differences.

## Declaration by Authors

**Ethical Approval:** Approved

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**Conflict of Interest:** The authors declare no conflict of interest.

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