

## **AGE AND GENDER AS FACTORS IN VISUAL PHOTOGRAPHIC MEMORY**

MAHFUZA KHANAM\*

*Department of Psychology, University of Dhaka, Dhaka-1000, Bangladesh*

*Key words:* Visual photographic memory

### **Abstract**

Exploring the role of gender and age in visual photographic memory were the objectives of the present study. A sample of 60 boys and 60 girls, aged between 11 to 16 years, participated in the current study. Results indicated that boys outperformed girls in visual photographic memory task. Age also found to be a significant variable. Significant mean differences have been observed among the respondents of 13, 14, 15, and 16 year with 11 year; 12 with 16; 13, 14, 15 with only 11 and finally 16 with age 11 and 12. Results revealed that there exists a significant mean difference between age 11 and 16. Findings also showed that visual memory increases with increasing age. But the rate of development is not same through all the years.

### **Introduction**

Visual memory is a form of memory which preserves some characteristics of our senses pertaining to visual experience. The experience of visual memory is also referred to as the mind's eye through which we can retrieve from our memory a mental image of original objects, places, animals, or people. "Photographic Memory" is the ability to recall images, sounds or objects in memory with extreme positions. It is also referred to as "Eidetic Memory". Photographic memory as it's compared to our brain "taking a snap-shot" of the moment, which it is able to refer back to when recalling memories. The term "photographic memory" is more often used to describe "eidetic imagery"<sup>(1)</sup>. Similarly, eidetic memory is sometimes called "Photographic Memory" because individuals who possesses eidetic memory can reproduce information from memory exactly the format in which it was provided during encoding"<sup>(2)</sup>. "Iconic memory may help to explain the remarkable phenomenon of eidetic imagery, popularly called photographic memory"<sup>(3)</sup>. Photographic memory only focuses on the visual information stored in our brain. Photographic memory is more complex than simply being able to recall everything. It ignores the sounds or movements involved.

Some researcher examined the effect of varying detail on memory<sup>(4)</sup>. Results suggest that old and young adults profit from visual embellishment and that memory for meaningful pictures remains relatively intact with age. Study result showed that repeated visual search can lead to improve in performance over seconds to minutes<sup>(5)</sup>. In

---

\*E-mail: <mahfuzakhanam007@yahoo.com>.

an experiment, pictures were shown to young and old subjects that differed in visual details (complex vs. simple) and propositional content (concrete vs. abstract)<sup>(6)</sup>. The results indicated that age differences in picture memory emerge if the pictures are either deprived of visual detail or reduced in propositional content. A study screened 500 elementary school-age children and found that as many as 50% of children possess eidetic memory<sup>(7)</sup>. Some of the researchers assessed the rate of forgetting standardized line drawings of common object in groups of young (M age=22 years) and older (M age =70.5 years) subjects<sup>(8)</sup>. The results indicated that aging does not affect retention of pictures when differences in learning retrieval abilities are controlled. Another study observed that individuals with ASDs performed worse than the normal group on visual memory task<sup>(9)</sup>.

Recent studies have found gender differences in episodic memory tasks favoring women, irrespective of whether verbal or visual material<sup>(10-12)</sup>. It is assumed that gender differences in episodic memory might, at least to some extent, depend on the type of task. So, it is not surprising that women excel when asked to verbally recall events from the past due to their superior verbal ability. If visual information could easily be verbalized, women might be able to utilize their advantage in verbal ability and perform better<sup>(13)</sup>. Similar gender differences have been found in relation to age from early childhood to puberty<sup>(14-15)</sup>.

The ability to remember episodes of past events is not only important for learning and personality development but also plays a decisive role in appropriate social functioning. Nevertheless, how gender specific advantages or disadvantages in memory performance are related to age has not been explored till now. Moreover, all the studies mentioned above have been conducted in western countries. Literature review did not yield a single study from our country to investigate the effect of gender and age on visual photographic memory test. Therefore, the present study would have some applied value as well as new insight. This present study shall thereby help to identify the difference between male and female students of different ages on visual photographic memory and will help to measure the quality of one's photographic memory test. In the light of above discussion, the objectives of the present study were:

- To investigate the difference, if any between male and female students of different age groups in visual photographic memory.
- To find out whether visual photographic memory increases with age.

### **Materials and Methods**

Sample of the present study were consisted of 60 students from High School. Among 60 students 30 were boys and rest 30 were girls. They were selected from two boys and two girls school. The age range of the students was 11-16 years and they were the students of class six to class ten. Non-probability sampling (Purposive Sampling &

convenience sampling) techniques was followed during the selection of sample. Most of the samples belonged to middle-class family.

The instruments that used for the present study were the following:

- Pictures of the booklet. There are six items of picture in the booklet. Five questions were asked from every picture item. So, in total, there were thirty questions. For every correct answer one mark was provided. The range of the scores was 0-30. Higher scores indicated higher level of visual photographic memory.
- Answer sheet, stop watch, pencil etc.

In the present study a cross sectional field experiment design was used. After taking permission of school authority and with the help of the class teacher, 60 students of whom 30 were boys and 30 girls were selected as participants. The sample was selected from 2 boys and 2 girls school. At first, the participants were given an oral instruction. Then a picture (Item No 1) was given to each student and only 30 seconds were provided to see the pictures. The respondents were needed to memorize these pictures. After 30 seconds, they returned back the picture to the administer and then an answer sheet for item no 1, was given to them and requested them to answer every question in the way that will be most true for them and to express their opinions by giving a tick mark in corresponding boxes by 1:30 seconds. The participants were provided all 6 pictures one after another in similar way and their responses were collected. The respondents were assured that the information given by them would be kept confidential and used for research purposes only. After the completion of the task, participants were thanked and given incentives (chips, chocolates and wafers) for their cooperation.

### Results and Discussion

To investigate the role of gender and age in visual photographic memory, the data were analyzed by 2x6 Analysis of Variance. Mean and standard deviation were also calculated. The results are presented in Tables 1, 2 and 3.

**Table 1. Summary of the analysis of variance in visual photographic memory according to gender and age.**

	Sum of squares	Df	Mean square	F	Sig.
Gender	49.408	1	49.408	6.31	0.013
Age	333.542	1	66.708	8.519	0
Gender x Age	44.342	1	8.868	1.133	0.348

While investigating the gender similarities or differences, many studies have found gender differences in memory tasks favoring women<sup>(10-12)</sup>. Because women typically show higher level performance than men on tasks assessing verbal ability. It can be assumed

that gender differences in episodic memory might, at least to some extent, depend on the type of task. A few studies found that men outperformed women in visual episodic memory tasks, whenever external verbal information and verbal processing was significantly reduced<sup>(17-18)</sup>. The findings of the present study revealed a significant gender difference in visual photographic memory tasks (Table 1). Results indicated boys have significantly more visual photographic memory (M=22.15) than their girls counterpart (M=20.7). The task of the recent research was to verbally recall the pictures; no external verbal information was given.

**Table 2. Mean and SD of the scores of visual photographic memory in different age and gender group.**

Gender	Age	Mean	Std. deviation	N
Boy	11	18.2	2.53	10
	12	21.6	3.41	10
	13	22.9	2.92	10
	14	23.0	3.56	10
	15	22.9	2.81	10
	16	24.3	2.67	10
			22.15	
Girl	11	18.4	3.03	10
	12	20.5	3.06	10
	13	19.8	2.49	10
	14	20.4	2.32	10
	15	22.1	2.23	10
	16	23.0	2.16	10
			20.7	

**Table 3. Mean and SD of visual memory scores according to age.**

Age	Mean	Std. deviation	N
11	18.3	2.72	20
12	20.55	3.15	20
13	21.35	3.08	20
14	21.7	3.21	20
15	22.5	2.50	20
16	23.65	2.45	20

Girls did not get the opportunity to utilize their advantage in verbal ability. All the participants concentrated more on visual details and less likely to verbalize while observing an image. This could be the reason behind boys performing better than girls. This finding is also consistent with the findings of some researchers<sup>(19)</sup>. They found that male adults showed higher level performances on visual working memory measures.

Results of the Table 1 indicated a significant age difference in visual photographic memory. The findings showed that the visual photographic memory increases with increasing age (Table 3). As age was found to be a significant variable, to investigate age differences post HOC test were calculated. The findings are presented in Table 4.

Results of the Table 4 Showed that mean scores of 11 years old participants differed significantly from the participants of age 13, 14, 15 and 16 years. 12 year old participants significantly differed from 16 year old participants. 13, 14 and 15 year old respondents have significant difference with only 11 year old participants and 16 years old have with 11 and 12 years.

Though the findings in Table 3 revealed that visual memory increases with increasing age, the rate of increment of memory was not same through all ages. At age 11, the level of memory span was 18.3 and at 16 year it was 23.65. A noticeable mean difference was found between these two groups. But, an up and down movement was revealed among age 12 to 15 year. It would be easily understand if we look at the Fig. 1. Some researchers concluded that age differences in picture memory emerge if the pictures are either deprived of visual detail or reduced in propositional contents<sup>(6)</sup>. These types of factors were not present in this research. So, these were not the reasons of age differences. A previous study found that aging does not affect retention of pictures when differences in learning retrieval abilities are controlled<sup>(8)</sup>. Here the abilities were also not controlled. It might be that the content of the pictures were more accessible to the older respondents than younger ones, which needs further exploration.

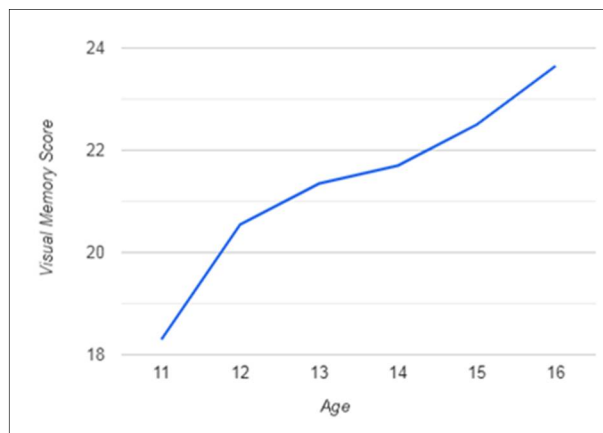


Fig. 1. Mean visual memory scores according to age

**Table 4. Post Hoc results of mean scores according to age.**

(I) Age (years)	(J) Age (years)	Mean Difference (I-J)	Std. Error	Sig.
11	12	-2.250	0.908	0.220
	13	-3.050*	0.908	0.016
	14	-3.400*	0.908	0.004
	15	-4.200*	0.908	0.000
	16	-5.350*	0.908	0.000
12	11	2.250	0.908	0.220
	13	-0.800	0.908	1.000
	14	-1.150	0.908	1.000
	15	-1.950	0.908	0.507
	16	-3.100*	0.908	0.013
13	11	3.050*	0.908	0.016
	12	0.800	0.908	1.000
	14	-0.350	0.908	1.000
	15	-1.150	0.908	1.000
	16	-2.300	0.908	0.190
14	11	3.400*	0.908	0.004
	12	1.150	0.908	1.000
	13	0.350	0.908	1.000
	15	-0.800	0.908	1.000
	16	-1.950	0.908	0.507
15	11	4.200*	0.908	0.000
	12	1.950	0.908	0.507
	13	1.150	0.908	1.000
	14	0.800	0.908	1.000
	16	-1.150	0.908	1.000
16	11	5.350*	0.908	0.000
	12	3.100*	0.908	0.013
	13	2.300	0.908	0.190
	14	1.950	0.908	0.507
	15	1.150	0.908	1.000

The result of the present study showed a non-significant interaction between age and gender. This finding is consistent with the findings of existing studies<sup>(19, 20)</sup>. They failed to find any age-by-gender interaction in memory relate studies.

In conclusion, it might be said that as visual photographic memory increases with age, providing relevant pictures with reading materials parents and teachers can facilitate to improve the performance of the children.

### Acknowledgement

The author gratefully acknowledges the Centre for Advanced Studies and Research in Biological Sciences for providing financial assistance to carry out the research work.

### References

1. Dennis C 2005. Psychology: A Modular Approach to Mind and Behavior. Cengage Learning. p. 310.
2. Taylor AK 2013. Encyclopedia of Human Memory (3 volumes) p. 951.
3. Scott L, JL Steven, N Laura, WG Nancy, M Anthony and S Virginia 2014. Psychology from Inquiry to Learning.
4. Park DC, JT Puglisi and AD Smith 1986. Memory for pictures: Does an age-related decline exist?. *Psychology and Aging* **1**(1): 11.
5. Vo M L H, and Wolfe JM 2012. When does repeated search in senses involve memory? Looking AT versus looking FOR objects in senses. *J. Exp. Psychol. Hum. Percept. Perform.* **38**: 23-41. Doi:10.1037/a0024147.
6. Smith AD, DC Park, K Cherry and K Berkovsky 1990. Age differences in memory for concrete and abstract pictures. *Journal of Gerontology* **45**(5): 205-210.
7. Haber RN and RB Haber 1964. Eidetic imagery: I. Frequency. *Perceptual and Motor Skills* **19**(1): 131-138.
8. Rybarczyk BD, RP Hart and SW Harkins 1987. Age and forgetting rate with pictorial stimuli. *Psychology and Aging* **2**(4): 404.
9. Salmanian M, MT Doost, MG Motlagh, Z Shahrivar 2012. Visual Memory of Meaningless Shapes in Children and Adolescents with Autism Spectrum Disorders. *Iran J. Psychiatry* **7**: 104-108.
10. Bloise SM and MK Johnson 2007. Memory for emotional and neutral information: Gender and individual differences in emotional sensitivity. *Memory* **15**(2): 192-204.
11. Herlitz A and JE Yonker 2002. Sex differences in episodic memory: The influence of intelligence. *Journal of Clinical and Experimental Neuropsychology* **24**(1): 107-114.
12. Lewin C, G Wolgers and A Herlitz 2001. Sex differences favoring women in verbal but not in visuospatial episodic memory. *Neuropsychology* **15**(2): 165.
13. Voyer D, A Postma, B Brake and J Imperato-McGinley 2007. Gender differences in object location memory: A meta-analysis. *Psychonomic bulletin and review* **14**(1): 23-38.
14. Davison KK and EJ Susman 2001. Are hormone levels and cognitive ability related during early adolescence?. *Journal of Behavioral Development* **25**(5): 416-428.

15. Quinn PC and LS Liben 2008. A sex difference in mental rotation in young infants. *Psychological science* **19**(11): 1067-1070.
16. Astur RS, ML Ortiz and RJ Sutherland 1998. A characterization of performance by men and women in a virtual Morris water task:: A large and reliable sex difference. *Behavioural Brain Research* **93**(1-2): 185-190.
17. Postma A, R Izendoorn and EH De Haan 1998. Sex differences in object location memory. *Brain and Cognition* **36**(3): 334-345.
18. Pauls F, F Petermann and AC Lepach 2013. Gender differences in episodic memory and visual working memory including the effects of age. <http://dx.doi.org/10.1080/09658211>.
19. Lemaître H, F Crivello, B Grassiot, A Alperovitch, C Tzourio and B Mazoyer 2005. Age and sex-related effects on the neuroanatomy of healthy elderly. *Neuroimage* **26**(3): 900-911.
20. Salat DH, RL Buckner, AZ Snyder, DN Greve, RS Desikan, E Busa and B Fischl 2004. Thinning of the cerebral cortex in aging. *Cerebral Cortex* **14**(7): 721-730.

*(Manuscript received: 7 February, 2021; accepted: 27 July, 2021)*