

Immediate Memory Span and Its Relation with Socio-Economic Variables

Geetika, Praveen Kaur and Meena Daulta

INTRODUCTION

Since the day psychologists began to explore the human mind and scale the mental abilities, memory studies gained priority and popularity. Memory is the most essential ability without which no learning can take place. In fact, memory refers to retaining, revival and recollection of the past events. People vary in its speed and width. All the tests of cognition or intelligence give it prime importance. Memory is generally categorized as temporary and permanent. It is also labeled as short term or long term. Both have separate stores. The short term store is a record of current contents of consciousness which may be lost rapidly. On the other hand, once the material has been transferred to long term store, little are the chances of its loss. Though memory, like intelligence has been found genetically determined, various organismic, environmental and stimuli related factors affect it. To measure memory as unaffected by associations with past experience Ebbinghaus (1885) invented the use of nonsense syllables – random sequence of letters or digits. Assessment of short term memory through immediate memory span has been in practice since long. The same is useful in educational guidance and vocational success. Immediate memory span is the length of material a person can grasp well enough to recall and reproduce it without error after hearing or seeing only once. This ability increases with age and reaches its peak of 8 digits between 15-30 years. Liben (1982), Nagaich (1986) and Banamali and Dash (1997) found it increasing with age because of developmental changes in use and awareness of strategies one applies while remembering. Misra and Dash (1996) found it related to speech rate. Faster articulation of the older children facilitate memory span. Misra and Dey (1988) found task relevant knowledge and task relevant strategies related to better retention. Nayar and Sen (1981), Ellis et al. (1989) and Bjerklie and Harton

(1992) found memory span correlated with intelligence. But it is also essential to know how it varies in different socio-economic family environments. Hence the present study attempts at studying the Immediate memory span for digits among the school children and various familial factors associated with it.

METHODOLOGY

A sample of 204 respondent children in the age of 8-10 years was drawn from various schools of Hisar city, giving fair representation to various socio-economic strata of society. The composition of the drawn sample is presented below.

Table 1: Sample composition

Age	8-9 years		9-10 years	
	Male	Female	Male	Female
Sex				
Income status				
Low	17	17	17	17
Middle	17	17	17	17
High	17	17	17	17
Total	51	51	51	51

The respondents were tested individually for memory span with the help of PGI Memory Scale (Pershad and Wig, 1976). Information on other aspects was obtained through personal interview with the help of pre-prepared questionnaire schedule.

RESULTS AND DISCUSSION

Table 2 shows that the span of immediate memory for digits varies among individuals belonging to various strata of society. The overall mean span is 5.68 for the children of 8 to 10 years. However, the younger ones in the age of 8-9 years had 5.62 average memory span and 9 to 10 years had 5.74 which shows that Immediate memory span increases with age, though the change is very slow and gradual. The two other

studies conducted on 10-12 and 12 to 14 years old; children further show its widening with age (Meenal, 1998; Mandakini, 1998). The same has been reported 6.05 for 10 to 12 and 6.21 for 12 to 14 years old children. The results show the tendency of its increase. There have been number of studies which report steady and progressive increase with age, rapid till adolescence, slower in early adulthood, stable during adulthood and diminishing in old age. Chang (1980), Liben (1982), Stern (1985), Nagaich (1986), Banamali and Das (1997) and many others obtained similar results. However, Dash (1988), Ellis et al. (1989) and Bjerklie and Horton (1992) did not find significant correlation between age and memory span.

Table 2: Mean digit span for various categories of respondents

S.No.	Variables	Categories	Digit span	Mean
1.	Age	8-9 years	5.62	5.68
		9-10 years	5.74	
2.	Sex	Male	5.63	5.73
		Female	5.73	
3.	Income	Low	5.24	5.94
		Middle	5.94	
		High	5.87	
4.	Caste	Low	5.03	5.75
		Middle	5.75	
		High	5.82	
5.	Education (Father)	Illiterate	5.16	5.98
		High school	5.18	
		Graduate	5.77	
		Post-graduate	5.98	
6.	Education (Mother)	Illiterate	5.41	6.42
		High school	5.78	
		Graduate	5.84	
		Post-graduate	6.42	
7.	Occupation (Father)	Labourer	4.24	5.83
		Trader	5.14	
		Business	5.77	
		Service	5.83	
8.	Occupation (Mother)	Labourer	4.50	5.95
		Business	5.16	
		Service	5.95	
		Housewife	5.64	
9.	Family type	Nuclear	5.68	5.92
		Joint	5.51	
		Extended	5.92	
10.	School environment	Low	5.15	5.51
		Medium	5.51	
		High	5.92	

As regards sex differences, the results of the present study show that females have slightly wider span of immediate memory than their male counterparts. The same has been obtained by Chang (1980), Kakar (1983), Konovalov et al. (1987) and Misra and Dey (1988). The sex differences are not striking has been reported by Nagaich (1986). Table 3 elucidates the association between memory span and various variables. Age (within the range) and sex has not shown statistically significant relationship. Family environment in which child is brought up may facilitate or set limit for this ability of the child. Family income, education, caste and occupation all speak of the psychological environment of the family. Limited resources deprive the child from opportunities for stimulation and growth of mental powers. In middle and high income families children get better opportunities for focusing attention and developing memorizing function. The present results show that Digit Span for immediate memory is comparatively less in low income families than the middle or high income families. Educated parents also take full care of their children's growing mental abilities by providing sufficient opportunities and conducive environment for mental growth hence their children have better memory score.

Children of uneducated parents, in general, waste their talents and their potentialities which sink or fade without blooming. The results have shown positive trend in memory scores as per the education of the father as well as that of the mother. So is the case with occupation, more visible trend with father's occupation than

Table 3: Association between memory span and socio-economic and developmental variables

Variables	d.f.	χ^2 - value
Age	2	1.095
Sex	2	5.145
Income	4	17.167**
Caste	4	10.679*
Education of father	6	28.486**
Education of mother	6	13.143**
Occupation of father	6	39.072**
Occupation of mother	6	9.371
Family type	4	3.603
Type of school	2	1.309
School environment	4	38.180**
Medium of instruction	4	41.585**

*Significant at .05 level

**Significant at .01 level

mother's. The same is confirmed with the results obtained through chi-square. Caste may not be a direct factor contributing towards child's memory. It is only due to the fact that the low caste people are generally, less educated and economically less resourceful. High caste people are educated, in better occupations and financially better-off, which all together put their children at advantageous position. The same is reflected in their higher memory score. They have obtained higher memory score whereas lowest is obtained by the children belonging to low castes. Income and caste have been proved significantly associated with memory (Table 3). Ray and Dutta (1997) by using standardized partial regression analysis found education as relatively stronger predictor of short term visual memory span. Formal schooling has been found associated by Cole and Scriber (1977) and Rogoff (1981). Banamali and Dash (1997) found the positive effect of SES but Kashinath and Gudi (1997) did not find significant differences in advantaged and disadvantaged children.

Family system whether joint or nuclear again speak of opportunities, training and discipline which is more favourable in nuclear or extended families rather than in joint families. Like home environment, school environment has also been found positively associated with memory. Medium of instruction refers to level of educating system. Definitely the English medium schools are privately run, charge higher fees and hence, only middle and higher income families can afford it. Moreover, they provide better facilities and opportunities to children. Memory like other domains of intelligence has unique and flexible schedules that are affected not only by age but also by the quality of the environment.

Results of the present study stress upon the need of creating favourable environment in schools and home for facilitating memory ability of the children and also to educationists to develop appropriate strategies for disadvantaged children.

KEY WORDS Memory. PGI Memory Scale. Socio-economic Variables.

ABSTRACT The immediate memory span for digits has been found to be 5.68 among 8-10 years old children with

some variations within groups. Girls scored higher than boys and 9-10 years scored higher than 8 to 9 years old children. Income, caste, education and occupation, family type and school environment also showed variation in mean memory span. However, the statistical analysis could prove the significance of association for income, caste, father's education and occupation and school environment.

REFERENCES

- Banamali, M. and Dash, A.: Effect of socio-economic status and age on working memory and spelling competence of children. *Psycholinguistics*, 27: 1-9 (1997).
- Bjorklie, G.L. and Harton, A.: Demographic and intellectual correlates of the short term memory test. *Psychological Reports*, 70: 113-114 (1992).
- Borode, R.R.: Age, sex and examination grades as a function of immediate recall. *J. Gujarat Research Society*, 2: 108-117 (1964).
- Chang, F.R.: Active memory process in visual sentence comprehensive clause effects and pre-nominal reference. *Memory and Cognition*, 5: 58-64 (1980).
- Cole, M. and Scriber, S.: Cross-cultural studies of memory and cognition. In: R.V. Kail, J.W. Hagen (Eds.). *Perspectives on the Development of Memory and Cognition*. Erlbaum, Hillsdale N.J. pp 239-271 (1977).
- Dash, U.N.: Influence of age and schooling on memory. *Indian Psychologist*, 5: 15-20 (1988).
- Ellis, N.R., Woodley, Z.A. and Dulancy, C.L.: Memory for spatial location in children and adults. *American Journal of Mental Retardation*, 93: 521-526 (1989).
- Ebbinghaus, H.: Measurement of memory. In: Swift, W., Porter (Eds.). *General Psychology*. McGraw Hill Book Company, N.Y. (1985).
- Fehrmann, Paul, G., Timothy, Z., Keith, Reimers, Thomas, M.: Home influence on school learning: Direct and indirect effects of parental involvement on high school grades. *Child Develop.*, 80: 330-337 (1987).
- Kakkar, S.B.: Sex difference in retaining quantitative material. *J. Indian Education*, Sept. Issue, 33-38 (1983).
- Kononov, V.F., Zhouravliov, G.I. and Gerikov, J.S.: Quality of simple and complicated forms of memory as a function of age and sex. *Questions of Psychology*, 4: 139-144 (1987).
- Kashinath, H.M. and Gudi Jayashree, B.: A comparative study of Guilford's Memory abilities among advantaged and disadvantaged students. *The Progress in Education*, 71: 152-154 (1997).
- Liben, L.S.: *Developmental study of children's memory*. Review of Human Development. Wiley, New York (1982).
- Mandakini.: *Performance, Intelligence, Memory Span and School Achievements Among 10-12 Years Old Children*. M.Sc. Thesis. H.A.U., Hisar, India (1988).
- Meenal.: *Performance, Intelligence, Memory Span and School Achievement Among Young Adolescents*. M.Sc. Thesis. H.A.U., Hisar, India (1998).
- Misra, Sushasni and Dash, U.N.: Sources of span differences. Relation among memory span, naming time and speech rate. *Psychological Studies*, 41: 41-44 (1996).
- Misra, R.C. and Dey, R.R.: Developmental and sex differences in children's spontaneous recall. *Indian Journal of Current Psychological Researches*, 3: 83-89 (1988).

- Nagaich, N.K.: The effect of age and sex on immediate memory span. *Asian J. Psychology and Education*, 17: 1-6 (1989).
- Nayar, R. and Sen, A.: Developmental trends in intelligence and memory span. An Empirical Study. *Indian J. of Psychology*, 56: 61-77(1981).
- Pershad, Dwarka and Wig, N.N.: *PGI Memory Scale. In Handbook for PGI Memory Scale (A Clinical Test)*. Psychological Corporation, Agra (1976).
- Ray, Debdulab and Dutta, N.: Resisting decline in short term memory span. Effect of age and education. *Psychological Studies*, 42: 151-154 (1997).
- Rogoff, B.: Schooling's influence on memory test performance. *Child Development*, 52: 260-267 (1981).
- Stern, L.: *The Structure and Strategies of Human Memory*. L.L. Darey Press, Homewood (1985).

Authors' Address: Geetika, Praveen Kaur and Meena Daulta, Department of Child Development, CCS Haryana Agricultural University, Hisar 125 004, Haryana, India