

Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram

Lalnunpuii^{1*}, Zokaitluangi²

ABSTRACT

Cognitive psychology is the scientific study of mental processes including memory which is a numerous biological device. The present study examines the levels of immediate and delayed Recall memory among 320 High School Students, comprised of equal representation of high and low academic achievers to find any significant difference between high and low academic achievers using the PGI-Memory Scale constructed by Pershad and Wig (1977 & 1988). Results highlighted a significant difference between a high academic achiever and low academic achievers on immediate and delayed recall, positive correlation between the immediate recall and delayed recall; and the effect of level of academic achievement effect immediate and delay recall memory. The findings suggested that the importance of immediate and delayed recall memory impact on children's educational resulting in academic achievement.

Keywords: *Memory, Immediate, Recall, Delay, Students, Cognitive*

One of the most crucial cognitive processes in organisms, memory which is considered frequently to predicts corollaries to academic achievement. Evidence from specialised research supports this claim that the relationship between memory and academic performance also exists in the context of schooling. Tulving & Craik (2000) define memory as how we retain and draw on our past experiences to use that information in the present (Tulving, 2000; Tulving & Craik, 2000). As a process, memory refers to the dynamic mechanisms associated with storing, retaining, and retrieving information about the experience (Bjorklund et al., 2003; Crowder, 1976). The large quantity of relevant research that concentrates on the teaching and learning process shows how important students' memory recall is (Pantziara & Philippou, 2015). Students with difficulties with retention, however, can have trouble recalling lectures in class. Recall, on the other hand, is used to gauge the student's memory in examination. It involves accurately reproducing what has already been taught. Thus, memory serves as a mental workspace for many crucial learning tasks and is a true indicator of a student's learning capacity. Additionally, memory deficiencies affect learners' ability to study and their ability to make slow academic progress (Gathercole & Alloway, 2008). An ample of research has investigated the relations between academic achievement and working memory with students (Rogers et al., 2012). Therefore,

¹Ph D research scholars, Department of Psychology, Mizoram University, Aizawl, India

²Professor, Department of Psychology, Mizoram University, Aizawl, India

*Corresponding Author

Received: May 29, 2023; Revision Received: June 04, 2023; Accepted: June 7, 2023

Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram

this present paper is concerned with immediate and delayed memory recall in particular with academic performance among high school students. Since research on the linkage between the levels of Immediate and Delayed memory on academic performance in adolescence is rare, our conceptualization of risk is motivated by research in related fields. It is, for this reason, we conducted this study for the students to better able to detect the possible memory impairment and highlight the potential correlation on academic achievement with immediate and delayed memory recall to improve academic performance and ensure more effective learning by keeping good memory retention skills.

Aim of the study

This research aimed to explore the link between Academic achievement (low and high academic achiever) and memory (immediate vs. delayed recall).

Objectives of the study

- To examine the level of immediate recall and delayed recall between low and high academic achievers of a high school student.
- To identify the correlation between the dependent variables of immediate and delayed recall among the samples
- To examine the independent effect of “academic achievement” on the dependent variables of immediate and delayed recall for the samples.

Hypothesis

- It was expected that there will be a difference in the level of immediate recall and delayed recall between low and high academic achievers of a high school student.
- It was expected that there will be a significant correlation between the dependent variables of immediate and delayed recall among the samples
- It was expected that there will be a significant independent effect of “academic achievement” on the dependent variables of immediate and delayed recall among the samples.

METHODOLOGY

Sample

The study targets to collect data 320 high school students [160 High academic achievers {80 Urban (40 male and 40 female) and 80 rural (40 male and 40female)} and 160 Low academic achievers {80 Urban (40 male and 40 female) and 80 rural (40 male and 40female)}] with the help of socio-demographic profiles constructed by the researcher and Statistical handbook of Mizoram (2011).

The tool used

The PGI-Memory Scale Constructed by Pershad and Wig (1977; 1988). The Post Graduate Institute Memory Scale gives a valid clinical evaluation of memory functions. It also confirmed the four hypotheses set to demonstrate its validity: a) Content Validity (b) Face Validity (c) Construct Validity. The PGIMS contained 10 sub-tests, but the present study employed the two subscales - (i) Delayed Recall- There are lists of five names each of common objects. The name of the common objects is read from list 1 and then asked the subject to recall the name of common objects after the expiry of the one-minute post-presentation period. In the same manner, the second list is also administered. Each ticked word is counted in two lists and one point for each score. The maximum score would be

Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram

5+5=10. ii) Immediate Recall- There are three sentences of increasing length, the first sentence has three clauses, the second has four clauses and the third has 5 clauses. Immediately after the presentation, the subject is said to recall. Each correctly recalled clause is scored one and the maximum score would be 3+4+5=12.

Research Design

The design was comparative which compared the two groups- High and low academic achievers on memory (immediate and delayed recall) and examined the strength of the relation between academic achievement and memory (immediate and delayed recall)

Procedures

The study starts with the identification and selection of samples as per objectives. Procurement of necessary permission from school authorities was taken for the study. After the samples were identified, necessary permission was taken, and oral and written informed consent was procured from each study sample. The purpose of the study was explained to all the study participants. Clearly explained that the participants may withdraw from the study at any time without any penalty. Assurance was given to the participants that confidentiality would be maintained throughout the study. The participants were clearly informed about what they had to perform during the conduction of the scale. The demographic questionnaire was administered to all participants and assisted in the identification of confounding variables that could affect the data. The administration of the PGI-MS was done to the selected samples with due care of instructions as given in the manual and APA Research Ethical Code (2002). Checking of the Psychometric properties with the conduction of Pilot study; Each student was tested individually in a well-illuminated quiet room at the participating school. The essential items required for the test were placed on the table before calling the participants into the room. The participant was called in and was made comfortable and rapport was established. A casual conversation was started and also motivated to do their best without any unnecessary pressure for each participant. The researcher made sure that the participants understood the test and after the necessary instructions were given and understood by the participant, the test began. The procedure was repeated for each student.

RESULTS

The raw data was checked for missing an outlier to be free from substandard data. The data was analyzed for descriptive statistics to depict the mean differences in immediate recall and delayed recall between high and low academic achievers. Results evinced that high academic achievers scored higher on immediate recall ($M= 4.00$) than low academic achievers ($M= 3.00$) which can be explained as high academic achievers were better in immediate memory than low academic achievers among the samples. In delayed recall, results also highlighted that high academic achievers scored higher on delayed recall ($M= 3.00$) than low academic achievers ($M= 2.00$); a significant difference between low and high academic achievers on immediate memory recall ($t=6.17^*$; $p<.01$) and delayed memory recall ($t=-4.45^*$; $p<.01$) which showed high academic achievers better in delayed memory recall than low academic achievers among the samples; which accepted the first hypothesis of the study.

The results also determined a positive significant relationship between immediate memory recall and delayed memory recall ($r=.38^*$; $p<.01$) which was accepted the second hypothesis of the study.

Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram

Results showed that Academic achievement showed an independent effect on immediate memory recall ($F= 67.48$; $p<.01$; $\eta^2 = .50$) having 50 % effect on immediate memory recall, and the same trend was also found on delayed memory recall ($F= 56.08$, $p< .01$; $\eta^2 = .48$) having 48% effect. Results of the study have confirmed academic achievement differences on immediate memory recall and delayed memory recall which accepted the third hypothesis. The findings of the study supporting earlier studies that the assumed role of working memory in many complex cognitive activities and in learning new information proved by high correlations between students' academic achievement scores and their working memory test scores (Du Plessis & Maree (2019). Alloway and his colleagues (2004) and Rogers and his colleagues (2012) investigated the relations between academic achievement and working memory with adolescent students. These studies found support for a relationship between verbal working memory and academic achievement among students (Rogers et al., 2012), and relationship between verbal working memory and phonological processing in younger students (Alloway et al., 2004).

Table 1 Showing Mean, SD, SEM, Normality, Reliability, Homogeneity, t-test, ANOVA, and Correlations on Immediate and Delay recall among the samples

Stats	Academic High Achievers		Academic Low Achievers		Total Samples	
	Immediate	Delay	Immediate	Delay	Immediate	Delay
Mean	4.00	3.00	3.00	2.00	3.50	2.50
SD	1.50	0.60	0.70	0.50	0.73	0.75
t-test	the t-test between High and Low Acad achievers on Immediate Memory is $t=6.17^*$			the t-test between High and Low Acad achievers on Delay memory is $t=-4.45^*$		
Academic achievement effect on Immediate and Delay (ANOVA)						
	Immediate Memory			Delay Memory		
Statistics	F ratio	Sig	Eta sg	F ratio	sig	Eta sg
Gender effect	67.48	.00	.50	56.08	.00	.48
Correlations between Immediate and Delay Recall is $r=.38^*$						

*= significant at .01 levels (2 tails)

**= significant at .05 levels (2 tails)

Limitations

The study has a limitation that the sub-areas of memory of the PGI Memory scale were not included only two areas were observed, and many factors of memory were not covered except much tempting academic achievement effects. It is suggested that future researchers should attempt to replicate these findings in a broader range of populations with more areas of memory.

Significance of the study

The study highlighted the potential academic achievement correlates to the differences in memory function, which extend to immediate memory recall and delayed memory recall. Poor immediate and delayed memory recall may lead to failures in performing daily classroom activities such as remembering classroom instructions and in learning (Lamont et al., 2006). Without early intervention, working memory deficits cannot be made up over time and will continue to compromise a child's likelihood of academic success (Alloway, 2009).

Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram

Implications

Students must be screened to identify the strengths and weaknesses of their memory profile for effective management and support to bolster learning. As Yuan and colleagues (2006) highlighted, improving Working memory capacity holds the promise of providing students with more cognitive resources for both knowledge acquisition and application. It may not only improve student's current achievement but more importantly, also enhance their lifelong learning.

REFERENCES

- Alloway, T. P., Gathercole, S.E., Willis, C., & Adams, A. (2004). A structural analysis of working memory and related cognitive skills in young children. *Journal of Experimental Child Psychology*, 87, 85-106.
- American Psychological Association (2002). "Ethical principles of psychologists and code of conduct" (PDF). *American Psychologist*. 57 (12): 1060–1073.
- Bjorklund, D. F., Schneider, W., & Hernández Blasi, C. (2003). Memory. In L. Nadel (Ed.), *Encyclopedia of cognitive science* (Vol. 2, pp. 1059–1065). London: Nature Publishing Group.
- Crowder, R. G. (1976). *Principles of learning and memory*. Hillsdale, NJ: Erlbaum.
- Du Plessis, S., & Maree, D. (2019). Auditory Short-Term Memory, Visual Sequential Memory and Inductive Reasoning Matter for Academic Achievement. *Edulearn19 Proceedings*. <https://doi.org/10.21125/edulearn.2019.0711>
- Gathercole SE, Alloway TP (2008). *Working memory and learning: A practical guide for teachers*. London: Sage Publications.
- Lamont, E., Gathercole, S. E., & Alloway, T. P. (2006). *Working memory in the classroom*. In S. Pickering (Ed.), *Working memory and education* (pp. 219- 240). Oxford, UK: Elsevier.
- Pantziara, M., & Philippou, G. N. (2015). Students' motivation in the mathematics classroom. Revealing causes and consequences. *International Journal of Science and Mathematics Education*, 13(2), 385-411.
- Pershad, D., & Wig, N. (1988). *Handbook for PGI Memory Scale Clinical Test*. National Psychological Corporation, Agra.
- Pershad, D., & Wig, N. N. (1977). P.G.I. Memory Scale: A normative study on elderly subjects. *Indian Journal of Clinical Psychology*, 4(1), 6–8.
- Pershad, D., & Wig, N.N. (1976). A battery of simple tests of memory for use in India. *Neurology India*, 24 (2), 86-93.
- Pershad, D., & Wig, N.N. (1977). *The Construction and Standardization of Clinical Test of Memory in Simple Hindi*. Agra: National Psychological Corporation.
- Rogers, M., Hwang, H., Toplak, M., Weiss, M., & Tannock, R. (2012). Inattention, working memory, and academic achievement in adolescents referred for attention-deficit/hyperactivity disorder (ADHD). *Child Neuropsychology*, 17(5), 444-458.
- Sherwood L (1 January 2015). *Human Physiology: From Cells to Systems*. Cengage Learning. pp. 157–162. ISBN 978-1-305-44551-2.
- Tulving, E. (2000). Memory: Overview. In A. Kazdin (ed.), *Encyclopedia of Psychology*, Vol 5 (pp. 161-162).
- Tulving, E., & Craik, F. I. M. (Eds.) (2000). *The Oxford handbook of memory*. New York: Oxford University Press.
- Yuan, K., Steedle, J., Shavelson, R., Alonzo, A., & Oppezzo, M. (2006). Working memory, fluid intelligence and science learning. *Educational Research Review*, 1, 83-98

Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram

Acknowledgement

It was highly recognized the students and teachers of the selected school who have helped to collect data for this research, with help only this research completed.

Conflict of Interest

The author(s) declared no conflict of interest.

Declaration

This article is taken out from the work of the Ph.D. research of the main author, not published anywhere in any form of publication.

How to cite this article: Lalnunpuii & Zokaitluangi (2023). Academic Achievement and Levels of Immediate and Delayed Recall among High School Students of Mizoram. *International Journal of Indian Psychology*, 11(2), 1847-1852. DIP:18.01.189.20231102, DOI:10.25215/1102.189