

# COGNITIVE CAPABILITIES AND LANGUAGE SKILLS OF PRESCHOOL CHILDREN WITH HEARING IMPAIRMENT

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## ABSTRACT

The purpose of this study is to find out the correlation between the cognitive capabilities and language skills among preschool children with Hearing Impairment. The sample of the study constituted 30 CwHI studying in Preschool. The data was collected on different aspects of cognitive capabilities and language skills in a preschool for children with hearing impairment with Padmini Cognitive Capability Test (PCCT) Pre-school Version-1 and Language Assessment Test (LAT) adapted version of Grade Level Assessment Device (GLAD). The scores of PCCT and LAT were compared and tested for correlation. Data was analyzed statistically to find out the correlation between PCCT and LAT scores and also compared the PCCT scores of Preschool CwHI and hearing children with the existing available data. Pearson correlation  $r=0.796$  was obtained for correlation between PCCT and LAT scores are significant at 0.001 level indicates positive correlation between cognitive capabilities and Language skills. And comparison of PCCT scores of Preschool CwHI and normal hearing children with same age group reveals that there is no difference in the performance of cognitive capabilities in both Preschool CwHI and Children with normal hearing.

**Keyword :** - Preschool Children with Hearing Impairment, Cognitive Capabilities, Language Skills.

## 1. CHILDREN WITH HEARING IMPAIRMENT (CwHI) - COGNITIVE DEVELOPMENT AND LANGUAGE SKILLS

Preschool education is the most important stage in school education because this is a stage when significant physical, cognitive, emotional & social developments takes place. Preschool education is the provision of education for children before the commencement of formal education. Several preschool programs for children with hearing impairment have promoted a cognitive/linguistic approach to learning [6,19,12,13]. In such an approach, language and thinking skills are emphasized in synchrony. Preschool is desirable for all the children, no doubt but it is necessary for disadvantaged and handicapped children. Preschool programs for CwHI strive to provide the child access to communicative competence through comprehensive habilitation including amplification, parent guidance, perceptual and cognitive skill development and aggressive language intervention. Parents are primarily responsible for the child's integration into the family, neighborhoods, school and community. The training, that families require can best come from professionals at an infant or preschool program [24].

Cognitive development is an important aspect of overall child development. The term cognition or cognitive development is a highly generic term covering almost every aspect of behavior. It is a continuous process that begins at birth and increases when tasks are in child's zone of proximal development level where child can almost accomplish task independently [18]. Thus cognitive development is the development of ways & capabilities of understanding one's world, representing it and dealing with it. Cognition develops through social interaction around problem solving abilities. Cognitive development involves progressive changes in children's perception, language, knowledge, understanding, reasoning and judgments [22].

Development of the cognitive process enables the child to deal with language, numerical concepts. Children's cognitive development affects how they learn, understand, store knowledge, characterize and interpret information, see relationships between and among ideas retain and retrieve information, use prior knowledge to gain new knowledge, and utilize knowledge in functional contexts. Among the developmental pre-requisite are object permanency, seriation, classification and conservation of quantity [16]. The children with hearing impairment are not basically different in their innate psychological potentialities from the hearing child. The mental growth of children with hearing impairment is different in many ways from that of the hearing child; nevertheless, there are also certain points of similarity between them; they have the same intellectual endowment and the same desire to communicate. They want to be like other people and they also possess the same feelings and emotions. The only difference is that they lack the ability to hear and consequently suffers from language handicap. However, it is essential for the parents and teachers of children with hearing impairment to have an insight in understanding the psychological factors that are intimately related with their academic and communication skills [4]. There is no reason to suspect limited mental ability because of impaired hearing itself, unless it is coupled with some deterioration or malfunctioning of the brain, which may also occur in other disability conditions. Language is the important tool for communication, which adversely affects the school life of Children with hearing impairment. So, it is important that language development plays a vital role in the life of CwHI. As cognitive development have a relation with language development [12,13]. Hence, a need was felt to study correlation between cognitive capabilities and language skills among CwHI.

Some researches [5,1] found that language development is very important for cognitive development, and there are indications that for the most part, children with hearing impairment develop normally cognitively. In an another study by [15] studied the cognitive development of Primary schools students she concluded that the cognitive development man effect by Socio-economic status, intelligence, institutional difference. And high cognitive capabilities might generally make for good academic achievement of the students, and vice versa. To this extent, cognitive development status can be useful predictor of academic achievement. Primary school programs emphasized on optimum utilization and further development of the cognitive abilities of children, among other dimensions of development.

## **2. OBJECTIVES OF THE STUDY**

1. To study the cognitive capabilities among preschool CwHI in the age group of 4-6 years.
2. To study the language skills among preschool CwHI in the age group of 4-6 years.
3. To examine the correlation of cognitive capabilities and language skills of preschool CwHI in the age group of 4-6 years.
4. To examine the correlation of cognitive capabilities between preschool CwHI and normal hearing children in the age group of 4-6 years.

## **3. HYPOTHESES**

1. There is no significant correlation between cognitive capabilities and language skills of CwHI in the age group of 4-6 Years.
2. There is no significant difference between the scores of cognitive capabilities of CwHI and normal hearing children.

## **3. METHOD**

### **3.1 Research Design**

This study employed descriptive research.

**3.2 Sample**

Thirty children with hearing impairment, age ranging from 4 to 6 years, studying in Special School at Coimbatore were selected. Children with any other significant associated disabilities were not included in the study.

**3.3 Tools used for the study**

(1) To assess the cognitive capability of pre-school CwHI, Padmini Cognitive Capability Test (PCCT), Pre-school Version-1 [15] was made use for this study. Padmini cognitive capability test has been developed and standardized by [15], Department of studies in Education, Mysore University. PCCT preschool version-1 consists of four tests as a) Length seriation b) Shape completion c) Action through signs d) Classification of picture. The test covers and evaluates a wide range of cognitive concepts appropriate to children of 4-6 years of age. (2)To assess the language capability(language skills) of pre-school CwHI, Language Assessment Test (LAT) was used in this study. It is the adapted version of Grade Level Assessment Device-GLAD [14]. LAT was adapted by the Department of Hearing Impairment, RKMVU-FDMSE to assess the language readiness of children in the age group of 4-6 years.

**4. DATA COLLECTION & ADMINISTRATION OF PCCT & LAT**

As the PCCT & LAT were individual performance readiness tests without time restriction, each child had to be given all the tasks of the PCCT & LAT. Administrations of all tasks were carried out in a play way method and each child was given instruction, in their mother tongue to complete the task. The researcher collected data from 30 pre-school CwHI studying in Special school at Coimbatore.

**5. RESULT**

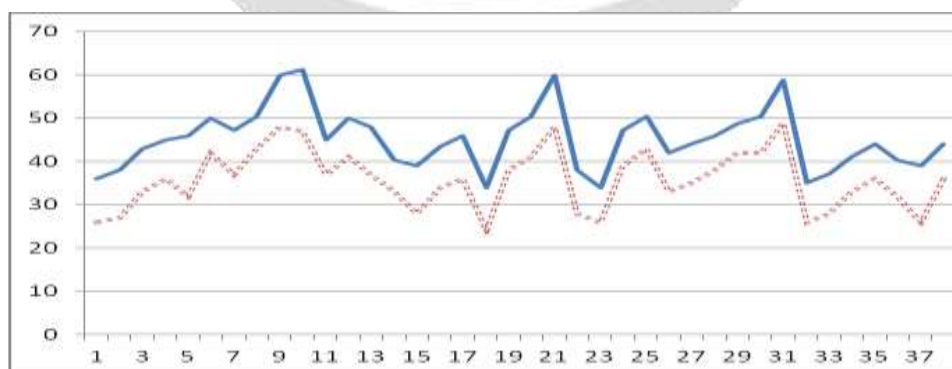
Data was analyzed statistically to find out the correlation of PCCT and LAT scores and the same scores were compared and tested to find out the significant difference, if any. The mean performance of PCCT scores were compared among Preschool CwHI, Kindergarten and Anganwadi normal hearing children from an earlier study [8] and tested for significance.

To find out the correlation if any between cognitive capabilities and language skills of children with hearing impairment, Pearson Correlation statistical test applied and the details are explained in the following table(1) and chart(1).

**Table -1** Correlation between PCCT and LAT Scores

Correlation		PCCT score
LAT score	Pearson Correlation	r = 0.796**

\*\* . Correlation is significant at the 0.001 level.



**Chart -1** Correlation between PCCT and LAT Scores

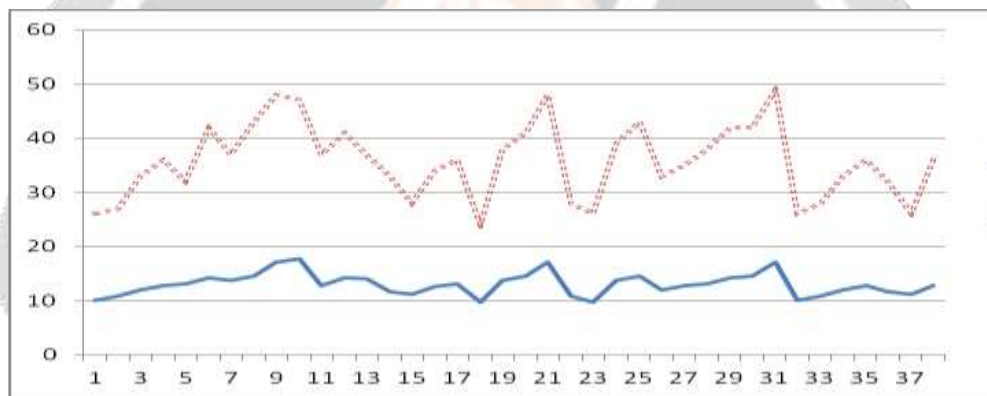
The correlation  $r = 0.796$  is significant at 0.001 level. This clearly indicates that there is a Positive correlation between PCCT scores and LAT scores. Hence hypothesis no.1, there is no significant correlation between cognitive abilities and language skills of children with hearing impairment in the age group 4-6 years is rejected. The results revealed that there is a positive correlation between cognition capabilities and language skills. The chart clearly shows that as the cognitive scores improve, so does language scores.

To find out the correlation if any between PCCT subtask scores and LAT scores of children with hearing impairment, Pearson Correlation statistical test applied and the details are explained the following table(2) and chart(2,3,4 &5).

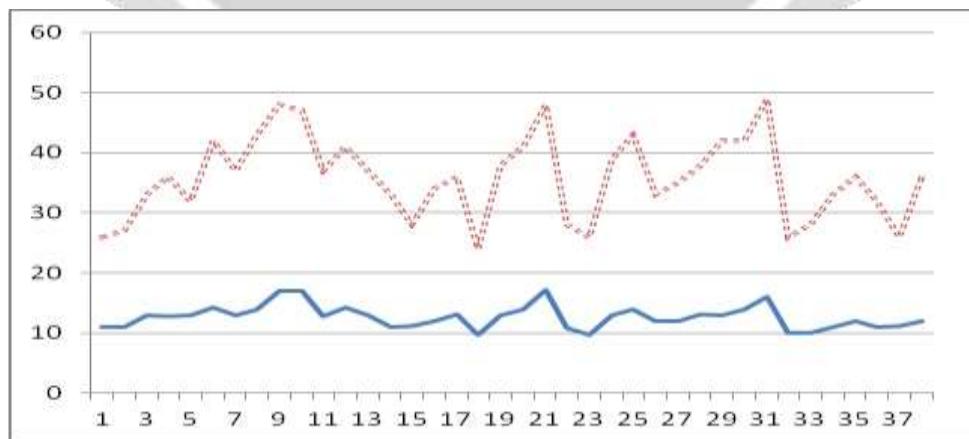
**Table -2** Correlation between LAT Score and PCCT Subtasks Scores

		PCCT subtasks Scores			
LAT score	Pearson Correlation	Shape Completion	Length seriation	Action through signs	Classification of pictures
		$r = 0.817^*$	$r = 0.735^*$	$r = 0.586^*$	$r = 0.748^*$

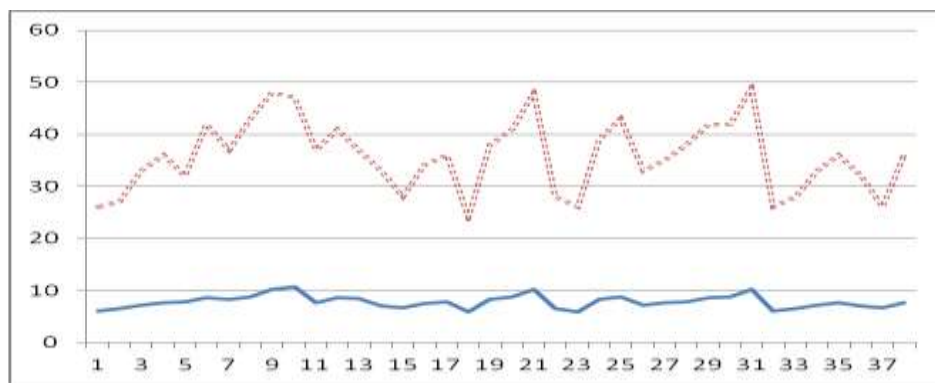
\* Correlation is significant at the 0.001 level.



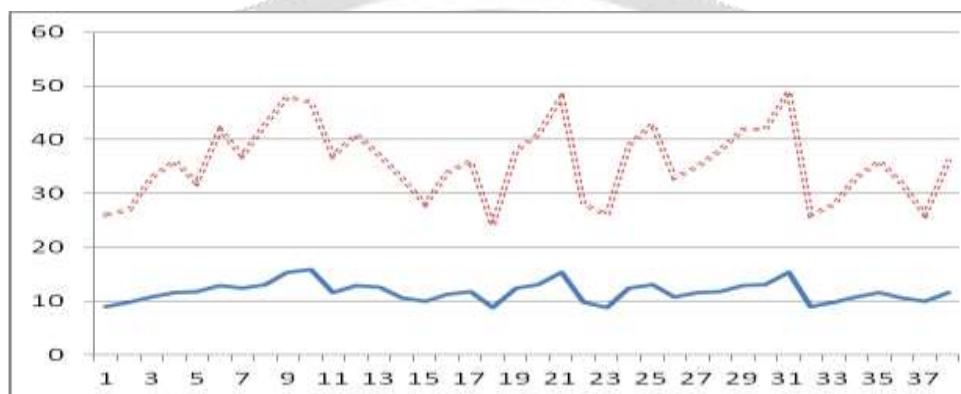
**Chart -2** Correlation between PCCT-Shape Completion and LAT Scores



**Chart -3** Correlation between PCCT- Length Seriation and LAT Scores



**Chart -4** Correlation between PCCT- Action through Signs and LAT Scores



**Chart -5** Correlation between PCCT-Classification of Pictures and LAT Scores

The above mentioned charts(2,3,4&5) shows the correlations  $r = 0.817$ ,  $r = 0.735$ ,  $r = 0.586$ ,  $r = 0.748$  are significant at 0.001 level. This clearly indicates that there is a positive correlation between PCCT subtasks scores (Shape Completion, Length Seriation, Action through signs and Classification of Pictures) and LAT scores. It can be inferred that as the cognitive capability increases, there is improvement in language skills too.

To find out the significant difference if any between the scores of cognitive capabilities of CwHI and normal hearing children. The data collected in the present study was compared with the data collected by [8] for normal hearing children in two different preschool setups. The table 3 as mentioned below gives the details:

**Table -2** Comparison PCCT Scores of CwHI with Normal Hearing Children

PCCT SCORES /SubTasks	CwHI		Anganwadi		Kinder Garten	
	Mean	SD	Mean	t-ratio	Mean	t-ratio
1. Shape Completion	15.15	3.84	4.30	17.870*	10.78	7.197*
2. Length Seriation	13.95	4.01	6.50	11.762*	11.75	3.473*
3. Action through Signs	14.73	3.23	3.95	21.168*	8.78	11.625*
4. Classification of Pictures.	8.50	2.47	5.05	8.833*	10.75	5.760**

\* t-value significant at 0.01 level in favor CwHI

\*\* t-value significant at 0.01 level in favor of normal hearing children.

No uniform trend is observed in the above table(3) in favor of either CwHI or normal hearing children. Hence hypothesis no.2, there is no significant difference between the scores of cognitive abilities of CwHI and normal hearing children is accepted. The results revealed that there is no difference in the cognitive capabilities of hearing and hearing impaired children studying in various pre-school set-ups such as Anganwadi, Kinder Garten and Special school.

## 6. DISCUSSION

The results of this study inferred that there is a significant positive correlation between PCCT scores and LAT scores of CwHI, as it is observed that the cognitive abilities improve language skills. Similar trend is observed by [3,10,23,2]. It is noticed in the present study, that all the four subtasks namely length seriation, shape completion, action through signs, classification of pictures of the cognitive ability assessed have correlation with language skills. This is also indicated in the current study that there is a significant correlation between PCCT subtask scores and LAT scores of CwHI. No uniform trend is observed in the study in favor of either CwHI or normal hearing children. However, the following observations were made which suggest the importance of enriched environment in preschool training to enhance cognitive capabilities.

1. In the Shape completion task, Length Seriation task and Action through signs task CwHI performed better than children attending Anganwadi and Kinder Garten.
2. In the task of Classification of Pictures alone Kinder Garten students performed better than children attending Anganwadi and Special School(CwHI).

Several studies [9,25,11,20,17,15,21] highlight the need for enriched environment, systematic and organized intervention in preschool, hands on experience to promote better cognitive abilities among children attending preschool. [5] observed that during the earlier years, CwHI and normal hearing children performed similarly on cognitive tasks. [19] noticed that difficulties of CwHI on certain cognitive tasks could be due to lack of experience.

## 7. EDUCATIONAL IMPLICATIONS

The findings of the present study, present a detailed picture of the current status of cognitive abilities and language skills of preschool CwHI. Hence there is an enormous scope to identify the strengths and weakness of preschool CwHI. Educational implications of the study are as follows:

1. This study gives an insight into relationship between cognitive capabilities of CwHI & its correlation in learning language skills, which can be utilized in teaching of language and other subjects which have more language exposure.
2. The findings of this study indicates the need to include activities to foster cognitive development in the pre-school curriculum for children with hearing impairment.
3. The findings of this study suggests that cognitive development must be deliberately taken up for children with or without disabilities.
4. Curriculum is a tool to help teachers to focus on child development. So special attention should be given to develop cognitive capabilities in the pre-school curriculum for both hearing and hearing impaired children.
5. Specific activities can be suggested for teachers and parents to enhance cognitive development in the early years of development.
6. Social interactions have a great educational value for cognitive development. When children interact socially with peers they can know the right answer of a problem, hence they should be encouraged to interact with their age mates, which can lead language development.
7. The children should be allowed to discover things on their own.

## 8. CONCLUSION

In the light of the above findings it is concluded that there is a momentous relationship between cognitive abilities of CwHI & its correlation in learning of language skills. If enriched environment, systematic and organized intervention in preschool, hands on experience are provided to CwHI, their cognitive abilities can be stimulated and promoted which in turn can benefit in other important and significant areas of development. These experiences help all the children irrespective of their disability to perform better academically. Preschool children with significant

hearing loss should be given special preliminary instructions. It gives a chance to pre-school CwHI to gain valuable school experience before undertaking a full school curriculum formally.

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