

## Performance of Visually Challenged Children on Verbal Tactile Test of Intelligence: Interaction Effects

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### ABSTRACT

*The present paper attempts to study verbal intelligence of visually challenged children with respect to their gender, school setting and age. Further attempt has been made to find out the interaction effect of independent variables i.e. gender, school setting and age on the dependent variable (verbal intelligence). A sample of 100 visually challenged children belonging to 11- 19 years of age; studying in inclusive and exclusive schools of Delhi region; having eligibility to read and write the Braille script was selected by employing purposive sampling technique. The findings of the study reveal that the performance of visually challenged children on verbal tactile test of intelligence becomes better as their age progressed. Moreover out of three independent variables i.e. gender, school setting and age, only age was found to have main effect on the dependent variable i.e. verbal intelligence while other two variables (gender and school setting) did not make any significant effect on this variable.*

**Keywords:** Visually challenged, Verbal tactile test, Intelligence.

### INTRODUCTION:

Human beings receive variety of information through visual channels. Our eyes are primary link with the external world and sight plays a very prominent role in the interaction with the environment. Vision dominates nearly all the early stages of development and helps to lay the necessary foundations for further intellectual growth (Foulke & Hatlen, 1992). A visually impaired child develops a different phenomenological world from the sighted as the total and partial absence of vision sense can limit his/her interaction with the environment, entail a restriction in the control of the environment and the self. The blind child constructs a reality that is different from the sighted one because he has limited ability to co-ordinate and organize elements into higher levels of abstraction, and to verify the information (Stephens & Grube, 1982); (Groenvelde & Jan, 1992). The degree of visual impairment is undoubtedly a very important factor. Even a limited amount of visual function may change substantially the nature of the information available to the child's cognitive growth. Some studies (Simpkins, 1979); (Jan, Sykanda, & Groenneld, 1990); (Foulke & Hatlen, 1992); (Warren, 1994); (Marjolein et al., 2014) reported that the process of establishing concept-defining attributes and relationships is more problematic for the blind child and less accessible to guidance. The blind child is continually involved in problem solving, but this process, which is essential to future development, is more difficult and less rewarding for him. Limited opportunities to explore objects and to see similarities are reflected in preschool blind children's classification errors. Concepts of same and different can evolve only if children identify the distinguishing variable on which to focus. Developmental lag is observed in the acquisition of mature conservation concept of substance (conservation of liquid volume, conservation of weight and length) and other properties among severely visually impaired (Tobin, 1972); (Gottesman, 1973). Blind children indicated up to four-year retardation for attaining specific concrete, manipulatory concepts (Hatwell, 1966). For conceptual

tasks and object permanence, a stable visual field is required, a blind child acquires the ability to reach the objects based on sound cue alone a year later than in sighted children, he has little difficulty generalizing across size, but numerous experiences with a variety of similar objects were required to accelerate generalization and association skills.

The review of related literature reveals a significant impact of vision sense on the development of mental abilities of visually challenged. The need is to explore the process of cognitive development of this population more comprehensively by considering their specific limitations. This study is about the ability to perform on verbal tactile test of intelligence in the absence of vision sense. The investigator has examined the interaction effect of gender, school setting and age of visually challenged children on their verbal intelligence ability.

**METHOD:****OBJECTIVES OF THE STUDY:**

1. To study verbal intelligence of visually challenged children with respect to their gender, school setting and age.
2. To find out the interaction effect of gender, school setting and age on the verbal intelligence of visually challenged children.

**Population and Sample:**

All the visually challenged students belonging to 11- 19 years of age, studying in inclusive and exclusive schools of Delhi region comprised the population of the present study. A sample of 100 visually challenged students (male & female) with the eligibility to read and write the Braille script was selected from the above population by employing purposive sampling technique.

**OPERATIONAL DEFINITIONS OF THE TERMS USED:****VERBAL INTELLIGENCE:**

Verbal intelligence is the ability to use language, to deal with meanings of words, to comprehend, to analyze and to reason with verbal material. It involves verbal comprehension, word fluency, inductive reasoning etc. In the present study, verbal intelligence is taken as the ability of visually challenged children to perform on verbal tactile test of intelligence comprised of variety of items written in Braille script.

**VISUALLY CHALLENGED:**

Visually challenged are individuals whose normal learning and development is impaired by visual conditions and who therefore, need specific conditions and related services in order to develop their abilities (Whitmore, 1981). In an educational (functional) definition, visually impaired or totally blind are those, who are so severely challenged that they must learn Braille to read and write. In the present study the visually challenged children means the children who are so impaired in vision sense that they require Braille script for reading and writing purpose.

**TOOL USED IN THE STUDY:****VERBAL TACTILE TEST OF INTELLIGENCE (VTTI):**

To assess the verbal intelligence of visually challenged children a Verbal Tactile Test of Intelligence (VTTI) was developed by the investigator as no such test was available suitable for the specific needs of this population. The test consisted of five sub tests i.e. Classification (14 items), Verbal Analogy (13 items), Number Series (12 items), Vocabulary (12 items) and Reasoning (12 items) with total 63 multiple choice type items written in Braille Script. Each item had four choices; the correct answer was awarded one mark while the wrong answer was given zero. The time given for the test was 1 hour 30 minutes. The test was found valid and reliable. The reliability of the test was computed by split half method (.89) and KR20 method (.82).

**DATA PROCESSING:**

The data processing was carried out keeping in view the objectives of the present study. The data were analyzed at two levels. Descriptive statistics like mean, standard deviation were computed at the first level while to study the interaction effects of the three independent variables (gender, school setting and age) on verbal intelligence 2 x 2 x 3 factorial design was employed by the investigator.

**RESULTS AND DISCUSSION:**

**Table 1: Descriptive Statistics on Verbal Intelligence of Visually Challenged Children with respect to gender, school setting and age**

Gender	School Setting	Age	N (100)	Mean	S.D.
Male (N = 52)	Inclusive (N = 27)	Age Group I (11 to 13 years)	8	37.25	3.92
		Age Group II (14 to 16 years)	7	39.85	6.64
		Age Group III (17 to 19 years)	12	40.41	6.03
	Exclusive (N = 25)	Age Group I (11 to 13 years)	8	38.12	5.64
		Age Group II (14 to 16 years)	8	41.87	7.18
		Age Group III (17 to 19 years)	9	44.66	4.09
Female (N = 48)	Inclusive (N = 21)	Age Group I (11 to 13 years)	7	35.00	4.50
		Age Group II (14 to 16 years)	9	40.00	3.46
		Age Group III (17 to 19 years)	5	43.60	6.46
	Exclusive (N = 27)	Age Group I (11 to 13 years)	8	35.37	2.44
		Age Group II (14 to 16 years)	7	39.57	2.93
		Age Group III (17 to 19 years)	12	46.25	2.73

The results given in above table indicate the mean scores and standard deviation of the scores on verbal intelligence of visually challenged children. The sample was categorized according to gender, school setting and age group. As shown in the above table the mean score of male students of the age group I (11 to 13 years) studying in inclusive school is 37.25 which is lower than the mean scores of their counterparts of age group II (39.85) and age group III (40.41). Similar trend was observed for male students studying in exclusive schools as the mean scores were found to be increased with increasing age. When data were analyzed for female students the mean scores of the age group I, II & III were 35.0, 40.0 & 43.60 respectively in inclusive schools and in exclusive school setting also the mean scores of female students were found in increasing order 35.37, 39.57 and 46.25 for age group I, II and III. The investigator had observed that the mean scores were increasing with the growth of age both for male and female students in inclusive and exclusive school setting as well. Further to study the interaction effects of these three independent variables i.e. gender, school setting and age on the dependent variable i.e. verbal intelligence of visually challenged children 2 x 2 x 3 factorial design was employed.

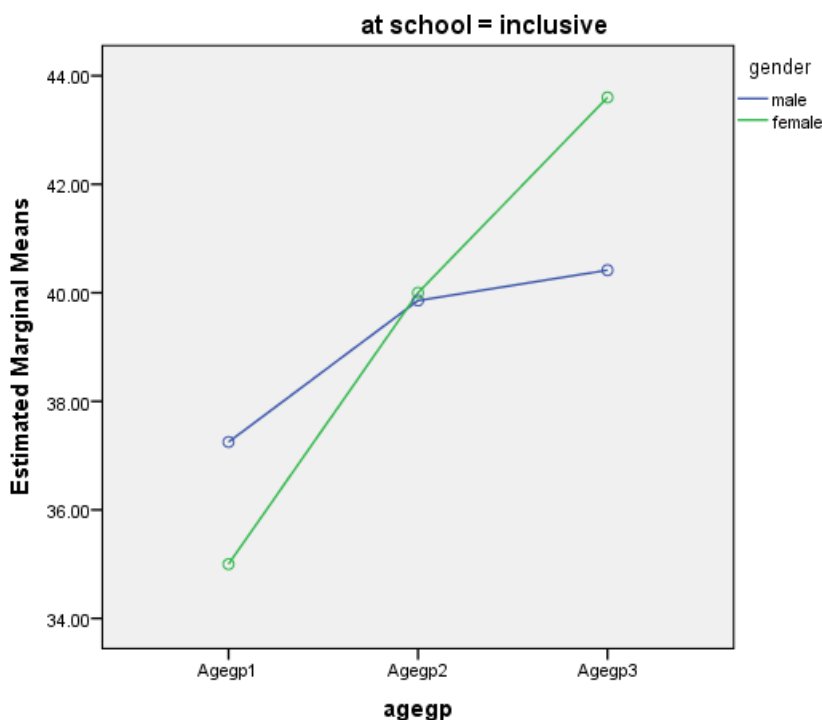
**Table 2: Summary of Analysis of Variance (2 x 2 x 3) Factorial Design for Verbal Intelligence on Gender, School Setting and Age**

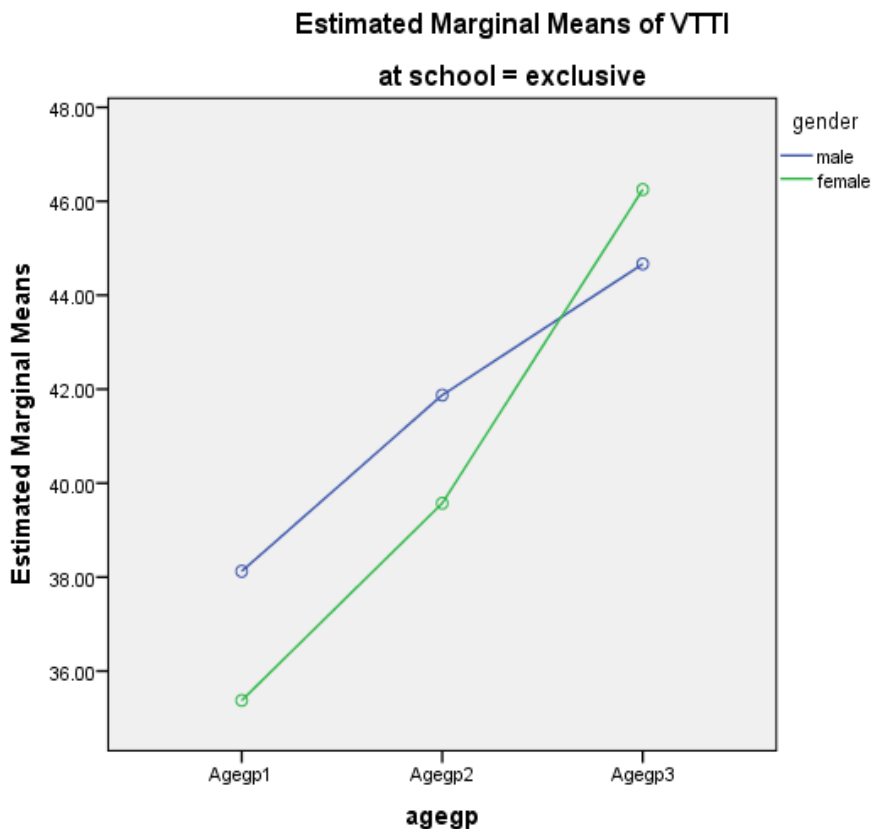
Tests of Between-Subjects Effects					
Dependent Variable: Verbal Intelligence					
Source of Variation	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1178.297 <sup>a</sup>	11	107.118	4.594	.000
Intercept	153092.225	1	153092.225	6565.157	.000
gender	3.777	1	3.777	.162	.688
school	62.508	1	62.508	2.681	.105
age group	855.583	2	427.791	18.345	.000
gender * school * age group	190.063	7	27.152	1.164	.331
Error	2052.063	88	23.319		
<b>Total</b>	<b>166608.000</b>	<b>100</b>			
Corrected Total	3230.360	99			

a. R Squared = .365 (Adjusted R Squared = .285)

The table 2 reveals that gender has no significant effect on verbal intelligence as the obtained F value (.162) was found to be insignificant. Thus it can be concluded that male and female visually challenged children do not differ significantly on verbal intelligence. The above table also depicts that type of school setting have no significant main effect on verbal intelligence of the students under study. The obtained F value (2.681) was not significant indicating that visually challenged students of inclusive and exclusive school setting were similar on the given variable. Moreover when the main effect of age was analyzed, it was found to have a significant impact on the dependent variable i.e. verbal intelligence. The calculated F value was 18.345, found significant at .01 level. The table 1 also shows that the mean scores of students on verbal intelligence were increasing with age. Further, the interaction among all the three independent variables was computed to study the effects of interaction on dependent variable. The result given in the above table indicates no significant interaction effect among the variables under study on verbal intelligence of visually challenged children. The obtained F value (1.164) was not significant. This led the investigator to conclude that in the present study age is the only variable which causes variance in the verbal intelligence of visually challenged children.

**Estimated Marginal Means of VTTI**





**Figure: Interaction effects of gender, school setting and age on verbal intelligence**

The figures given above also depict that the mean scores of both male and female visually challenged were progressed with the increased age. The same trend was observed both in inclusive as well as in exclusive school settings. These findings were in coordination with the results of the study conducted by (Rani, 2017) who concluded that age of visually challenged children has a determining effect on the verbal intellectual ability of visually challenged children.

**CONCLUSION AND SUGGESTIONS:**

The results of the present study indicate a continuous increase in the mean scores from lower age group to higher age group both for male and female students in inclusive as well as exclusive schools. The findings of the study further reveal that out of three independent variables i.e. gender, school setting and age only age was found to have main effect on the dependent variable i.e. verbal intelligence while other two variables (gender and school setting) did not make any significant effect on this variable. Microanalysis of the findings of the present study led the investigator to conclude that the performance of visually challenged on verbal tactile test of intelligence becomes better as their age progressed irrespective of their gender and type of school setting. Thus it can be said with firmness that age of visually challenged is a key factor in shaping their ability to deal with language & text, to comprehend meanings of words, to analyze verbal material etc.

The investigator suggested to the teachers, resource persons and researchers to develop or to adapt suitable teaching material for visually challenged children specifically according to the diverse requirements of their age group. In order to assess their cognitive abilities, testing equipments should be developed keeping in mind their different abilities rather than directly using tools developed for sighted. The researches should be promoted to construct and standardize testing materials in tactile format in order to make accurate predictions about the cognitive, affective and psychomotor aspects of behavior of visually challenged population, which ultimately will helpful in understanding their personality, to make suitable educational provisions and to rehabilitate them as per their capabilities.

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