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Cognitive Development in Deaf Children

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Abstract: Hearing gives the child the acoustic correlates of the physical world: hearing conveys much more to the growing child than the acoustics of the physical world. Hearing is the sensory modality through which children perceive speech — the universe of talk that ties individuals, families and societies together. Deafness, hearing impairment, or hearing loss is a partial or total inability to hear. Cognitive development entails more than maturation of the child's brain. Cognitive development is the product of the child's attempts to understand the family, neighborhood, school and the world at large during the period of rapid brain growth and learning. Hearing loss is linked to a faster cognitive decline and cognitive impairment .The effects of deafness on cognitive development are, therefore, quite diverse and complex due to the multitudinous ways in which families, societies, and cultures, react to and interact with children who are born deaf and hence do not spontaneously learn to talk and comprehend speech.

I. Introduction

Children born with bilateral hearing losses that are severe (70–89 dB loss) or profound (>90 dB loss) are referred to as deaf. They cannot hear conversational speech (approximately 60 dB) and consequently do not spontaneously learn to talk. The primary consequence of childhood deafness is that it blocks the development of spoken language — both the acts of speaking and comprehending. deafness impedes the development of spoken language, we must ask whether complex and logical thought can develop in the absence of spoken language. Can the child develop 'inner thought' or working memory without the ability to hear? Can sign language foster the same kinds of abstract mental development and complex thought as speech? Now consider an even more complex situation, namely, the cognitive development of children who grow up with little or no exposure to any language in any form, be it signed or spoken, as a simple consequence of being born deaf. What are the effects of such linguistic and social isolation on the child's development of a mental life? Each of these questions has been asked about deaf children in one form or another since the beginning of philosophical inquiry (Lane, 1984).There is a need for study to find out the level of cognitive development in deaf children and to help these children to improve their cognitive aspects to the fullest extent. It is very essential to know the cognitive development of these children, that is, to know in which aspect they are capable of coping with the normal, in what way they differ, in which aspect they differ, why they show difference? So this also creates a need to compare the process of cognitive development of these children with the normal children. Ultimately, this comparative study help to provide proper educational facilities and foster them to develop to fullest extent, normalizing them in this aspect and integrating them.

II. Review of Related Literature

The Gallaudet Research Institute regularly collects and analyzes demographic data on the academic achievement of deaf children in the United States based on the Stanford Achievement Test (Allen, 1994). The median math computation skills of 15-year-old deaf children in the USA are at the 7th grade level. Age-matched hearing children perform at the 10th grade level (Allen, 1989). These statistics show that deafness, by itself, does not impede the child's ability to learn and manipulate abstract symbols and symbolic relations. By contrast, the median reading achievement of 17–21-year-old deaf students leaving American secondary schools is at the 4th grade level (Allen, 1994). This wide performance gap between language tasks as compared to non-language tasks is a common profile among deaf children worldwide (Conrad, 1979). These academic performance patterns illustrate the great difficulty experienced by deaf children perceiving and learning spoken language and visual representations of speech, namely written and read language. Indeed, the effects of deafness on spoken language development increase as degree of hearing loss increases. For example, students with mild to moderate hearing losses read at lower levels than do

students with normal hearing. Furthermore, students with severe to profound hearing losses read more poorly than do students with moderate losses but on math computation they show equivalent achievement (Allen and Schoem, 1997).The deaf children have difficulty in mental imagery, concept formation, problem solving, language learning, academic achievement, and navigating everyday life (Sternberg, 1989). In asking how hearing affects the child's cognitive development, it is found that the primary deficit posed by deafness is a high risk for impoverished language acquisition in any form. It is seen that the deaf children, as a group, show heterogeneous levels of language development related to both the developmental timing and accessibility of their language exposure. Some deaf children show high levels of language development (in signed or spoken language) commensurate with those of hearing peers but other deaf children show significantly delayed and depressed levels of language (in signed or spoken language). This state of affairs leads to two important questions. First, what are the consequences of this wide variation in language development (in signed or spoken language) for cognitive development? Second, does the sensory modality of the child's primary language (i.e., signed versus spoken language) have any specific effects on cognitive development? The median reading level of the deaf, high school population does not reach the level required for a person to be considered literate (i.e., the 6th to 8th grade level and beyond). Indeed, the median reading levels of the deaf student population have not changed much over the past century (Chamberlain and Mayberry, 2000). Deafness creates a barrier to reading development. However, if the barrier were insurmountable, no deaf students would read proficiently. It is important to remember that these reading statistics are median reading levels. Half of deaf high school students read below the fourth grade level but half also read above this level. In fact, whether sign language can provide the cognitive foundation that spoken language provides for reading development has been a matter of considerable debate for decades. Only recently has the question been investigated in a systematic fashion (Chamberlain and Mayberry, 2000). If sign language development interferes with reading development, then there should be a negative relation between deaf children's sign language skills and reading ability but recent research has found the opposite relation. Recent research shows a positive correlation between sign language skills and reading development.

III. Objectives of The Study

1. To study the cognitive development of deaf children.
2. To find the difference in cognitive development between deaf children and normal children.
3. To find the difference in achievement between deaf children and normal children.
4. To find the difference in intelligence between deaf children and normal children.
5. To find the relationship among intelligence, achievement and cognitive development among deaf children.
6. To find the relationship among intelligence, achievement and cognitive development among normal children.

IV. Sample of The Study

The sample consisted of deaf and normal children studying in the secondary schools of Mysore city. The sample size was 59 students that is 31 students among the normal and 28 students among the deaf. Out of 31 normal students, 20 students were boys and 11 students were girls. Out of 28 deaf students 18 students were boys and 10 students were girls.

V. Tools used for The Study

The tools used for the study are as follows

1. Raven's coloured progressive matrices developed during the year 1856.
2. Cognitive development status test developed by Dr. T.Padmini and Dr. P.R. Nayar, University of Mysore during the year 1990.

VI. Procedure

The sample was drawn randomly from special schools, and regular schools of Mysore city. The cognitive development status test and Raven's colored progressive matrices test were administered to both the groups of deaf and normal children. Total communication method was used to communicate with the deaf children. The academic achievement of deaf and normal children was noted from the school records.

VII. Statistical Techniques

Suitable statistical techniques were used in this study. They were:

1. 't' test was used to find the difference among cognitive development, achievement and intelligence between deaf and normal children.
2. Pearson's correlation was used to find the relationship between cognitive development, achievement and intelligence among deaf and normal children.

VIII. Major Findings of The Study

1. In the present study, it was found that 4% of the deaf children were at the average level in cognitive development, 96% were above average. Similarly normal children were 100% above the average level.
2. There was no significant difference in cognitive development between deaf children and normal children.
3. There was significant difference in achievement between deaf children and normal children.
4. There was no significant difference in intelligence between deaf children and normal children.
5. There was significant relationship among intelligence, achievement and cognitive development among deaf children.
6. There was significant relationship among intelligence, achievement and cognitive development among normal children.

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