Psychological Aspects Among the Hearing Impaired Children

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Abstract

The study examines certain psychological aspects such as intelligence, memory, temperament and social functioning in the sensory neural and conductive hearing impaired groups as compared with the mentally retarded and the normal control groups. Canonical discriminant function analysis resulted in the emergence of two discriminant functions which were named the "Affective" and the "Cognitive" dimensions. The sensory neural hearing impaired group manifested deficits on the affective dimension. No deficits were evident on the cognitive dimension in both the hearing impaired groups. The mentally retarded group manifested severe cognitive deficits. The findings provided several insights for habilitating and planning modes of intervention for the sensory neural hearing impaired.

Introduction

The early years are considered as the most significant period of childhood, wherein the foundation for several complex behaviors is laid. The child and the environment are inseparable and their constant interaction culminates in the emergence of various behaviour patterns fostering an overall development of the child. Early deafness occurring at a crucial moment when the most important stimulation provided to a child is the human voice, has far reaching consequences, some of which are probably irreparable. The impairment weighs heavy, rendering adaptation and adjustment an uphill task (Altschuler, 1976; Bess & Me Connel, 1981; Schlesinger, 1978).

The implications of hearing impairment in a child are many and complex. A close contact with the environment is difficult to maintain rendering the child incapable of interacting with the environment optimally, thereby leading to loneliness (Jongkees, 1983). Levine (1971) makes an interesting note that "the deaf child's world is a place of widely different sensory, perceptual and associated life experiences from those of the hearing. Consequently even though the deaf and hearing children live in the same place, even the same home, they can nevertheless be worlds apart psychologically" (P. 83).

While studying the psychological aspects of the hearing impaired one cannot ignore the study of their cognitive functions (Savage, Evans & Savage, 1987). The child receives all the information regarding the external world from the senses based on which the world of perceptions and conception of memory, thought and reason is developed (Myklebust, 1966). The impairment limits the information intake and may probably lead to distorted perception and conceptions.

It is possible that the hearing impairment leads to difficulty in expression, which in turn, may even evoke aggression or withdrawal and foster dependency. A sense of security and comfort conceded to a hearing child may lead to a sense of isolation, frustration and behavioral problems. The total experience, which is the resultant of the total input from all the senses significant for the development of personality, is deficient. Hearing impairment may have

detrimental effects on the emotional well-being and integration in a hearing-impaired child. It may even hinder social development.

Granted that the hearing-impaired child differs from the normal hearing children, a psychologist comes face-to-face with the basic question, as to how the deaf child differs from the normal child and in what way the two resemble each other. In order to answer this question, a psychologist may select appropriate variables and constructs for investigation. Psychological testing of the child would provide an objective measure, thereby providing information regarding the strengths and weaknesses of the constructs under study.

The purpose of the present investigation was to examine whether the children with hearing impairment (sensory neural and conductive hearing loss) discriminate themselves from mentally retarded and normal subjects on the various psychological functions under study. The question whether the performance of the sensory neural hearing impaired children who manifest deficits in the "acquisition of language" differs from the mentally retarded children who manifest deficits in the "acquisition of knowledge" prompted the inclusion of mentally retarded group in the present study.

Method

The sample of the experimental group comprised of children with sensory neural and conductive hearing loss and was drawn from (the Out Patient Units of) the All India Institute of Speech and Hearing, Mysore.

The Sensory-neural hearing-impaired group comprised of 58 children having severe and profound degree of hearing impairment. Children whose average threshold level of hearing was 71 to 90 dB belonged to the category of severe hearing loss and children with a loss of 91 dB+ belonged to the category of profound hearing loss (Goodman's Scale, modified by Clark, cited in Katz, Gabby, Ungerleitder & Wilde, 1981). This group of children fulfilled the following criteria:

1. Bilateral sensory hearing loss.
2. The hearing loss was congenital in origin.

The conductive hearing impaired group comprised of 55 children with moderate degree of hearing loss. Children whose average threshold of hearing was 41 to 55 dB belonged to the category of moderate hearing loss (Goodman's Scale, modified by Clark, 1981). The degree of hearing loss was determined and confirmed by the audiologists and the otolaryngologists, in both the groups.

The control group comprised of a group of mentally retarded and normal hearing children.

The mentally retarded groups comprised of 50 children belonging to the moderate and mild categories of mental retardation.

The normal hearing group comprised of 54 children drawn from different schools in the city of Mysore.

All the 4 groups consisted of children of both sexes within the age range of 6 to 12 years. Based on the age and sex, the 4 groups were further sub-divided into 24 sub-groups.

In an attempt to study whether the sample groups differed on various aspects like intelligence, memory, temperament including emotionality, energy level, attentivity, and rhythmicity, the following tools were used.

Tools

Intelligence: Wechsler's intelligence scale for children (Wechsler, 1949).

Memory: Digit span tests

1. Digits Forwards
2. Digits Backwards (Wechsler, 1949)

Pattern Drawing test (Kamath, 1963)

Pattern of Movements (Cattel, 1953)

Temperament: Malhotra's Temperamental Schedule (Malhotra, 1988).

Social: Vineland Social Maturity Scale (Malin, 1972)

All the tools were administered to the subjects under study individually with pantomime instructions. After scoring, the results were subjected to statistical analysis.

Statistical Analysis

In order to statistically distinguish between the 4 groups, a number of discriminating variables were selected and subjected to Discriminant Analysis. Klecka, (1975) remarks that "The mathematical objective of discriminant analysis is to weight and linearly combine the discriminant variables in some fashion so that the groups are forced to be as statistically distinct as possible" (P. 435).

The F ratios and the eta squares of the variables being significantly large, all the 21 variables were included. As a next step, for preparing the basis for canonical discriminant analysis, the correlation matrices were arrived at for among groups, within groups and for the total. Subsequently, the group means for each variable and the total means for all 21 variables were derived.

A product matrix was constructed by multiplying the between groups by the inverse of within group matrix. Using an interactive procedure the latent roots and their

corresponding (normalized) vectors were obtained. The latent roots were further tested for statistical significance to find out that minimum number of dimensions required to account for the variance.

As a result 10 discriminants emerged. The canonical correlations revealed that the first two discriminant functions were highly correlated with the variables. The eigen values of the first two functions along with their associated canonical correlations were very high indicating the importance of these discriminant functions to separate the groups. The Lambda values of the first two functions/roots was very iow, revealing high discriminating power. Only the first two roots/functions removed covered 75.46% of the total variance. The third function, though significant, contributed for only a minor percent of the total variance. So, it was not taken into consideration.

The scores dealing with the factor patterns of only two discriminant functions are presented in table 1.

Table 1. The factor pattern for discriminant functions

Test	Variable	Function-1	Function-1
TEST1	Age	-0913	-2076
TEST 2	Duration	9297	-3058
TEST 3	Picture Completion	0747	-7307
TEST 4	Picture Arrangement	2145	-7088
TEST 5	Block Design	0233	-7179
TEST 6	Object Assembly	3140	-3588
TEST 7	Coding	-1611	-6860
TEST 8	Performance Quotient	0958	
TEST 9	Digits Forwards	-3484	-7139
TEST 10	Digits Backwards	-1614	-7248
TEST 11	Total (9+10)	-2733	-7539
TEST 12	Pattern A	-2718	-6887
TEST 13	Pattern B	-1707	-6385
TEST 14	Total (12+13)	-2494	-7344
TEST 15	Mental Age	2777	-7895
TEST 16	Social Age	0613	-7327
TEST 17	Sociability	-4484	-6994
TEST 18	Emotionality	-6066	-4909
TEST 19	Energy level	-5609	-5571
TEST 20	Attentivity	-2871	-6488
TEST 21	Rhythmicity	3231	-5207

The variables with a factor loading of .35 and above only were taken into consideration. Since this string of variables has an affective component, this dimension was meaningfully termed as "affective dimension'.

Since most of the variables with highest loading related to cognitive aspects, this dimension was labelled as "cognitive dimension".

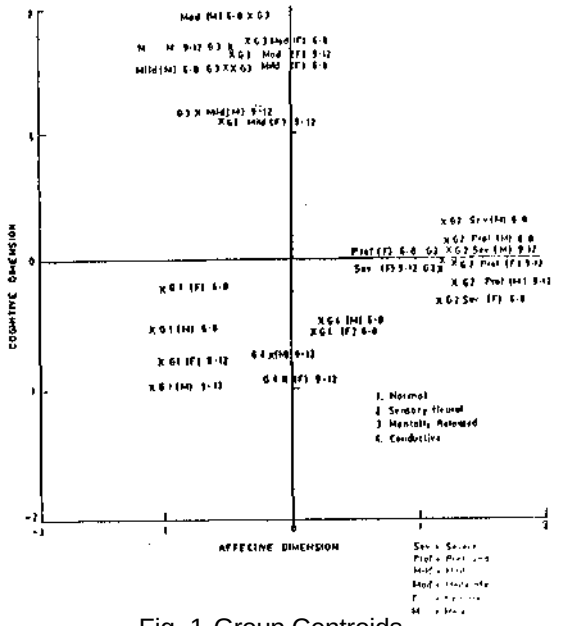

Fig. 1 Group Centroids

Evidence regarding group differences was derived from group centroids, which gives the group means on their respective functions. The centroids indicate the degree of separation among groups on the respective functions. The group centroids in canonical space for the first two discriminant functions are given in table 1 and are plotted in figure-1.

In figure 1, the 'X' axis is named as the Affective dimension and T axis as the Cognitive dimension. When one scrutinizes the nature of clustering with respect to the dimensional space, it becomes evident that all the sub-groups belonging to the parental group cluster together.

In the quadrant -x-y', the four sub-groups belonging to the normal control group cluster together. The lower age groups are closer to one another than the older age groups.

In the quadrant '-x+y', the eight groups belonging to the mentally retarded category cluster together. With the distance between the normal and the mentally retarded groups being quite considerable both groups align themselves in totally different quadrants. Within the clustering, the group with mild retardation distinguishes itself from the group with moderate retardation. Here again, there is a slight tendency for the lower age groups and the older age groups to cluster closer to each other. In the group with mild retardation, the subjects belonging to the lower range align themselves distinctly from the subjects belonging to older age. A very minimal influence of the variable, age is noticed as against sex, which does not even manifest the slightest influence.

The sensory neural hearing impaired group, aligns itself on either side of the cutting line of the two Quadrants *+x-y' and 'x+y'. It is clearly evident that the groups irrespective of their age, sex or duration of hearing impairment, cluster together with neither of these factors having any differentiating effect on them.

The conductive hearing impaired group falls in quadrant '-x-y' and ᵛ+x-y". It can be observed that of all the four groups, the older age groups cluster themselves in quadrant"-x-y" and the younger age groups in quadrant '+x-y'. Age as a factor has a certain amount of influence on the alignment. Sex does not show any effect on the alignment.

It is evident from Figure 1 that the four sub-groups in the normal control group, eight sub-groups in the mentally retarded group, eight sub-groups in the sensory neural hearing impaired group and four sub-groups in the conductive hearing impaired group cluster together on the dimensional space. Hence, the 24 groups were considered as only four groups. Since the clustering is distinct, one can presume that it is possible to classify the subjects under study in particular groups, based on their respective performance on the psychological tests.

Dimension 1: Affective dimension

The variable 'duration' has the highest loading contributing to the first dimension. Duration here refers to the time of onset of hearing impairment which in the sensory neural hearing group was congenital. Being cut off totally from the sound world proves detrimental to the development of the communication pattern of this group. The inability to communicate has significant impact on the personality and temperamental/emotional adjustment of the sensory neural hearing impaired group. As a consequence, this group distinguishes itself from the other groups on the affective dimension, revealing poor adjustment.

Several investigators have come to the conclusion regarding the emotional status, of the hearing handicapped individuals and have found difficulties in adjustment by them in general. They are most often considered to be egocentric, impulsive, irritable suggestive, introverted, aggressive, dependent and so on.

In the case of conductive hearing impaired group, the duration of hearing impairment is not very long and hence their adjustment on the affective dimension is betterthan sensory neural hearing impaired group. Thus, greater the duration of hearing impairment, the more severe are the emotional repercussions (Eisenoerg, 1970; Myklebust, 1966; Sanders, 1980).

The other variables with a high loading which contribute to the fisst discriminant function are emotionality, energy level, sociability and rhythmicity. All these variables are related to temperament. These variables constituting the aspects of temperament have been successful in discriminating the four groups, wherein the normal control group can be described as showing good asjustment.

The present study, however, brought out the interesting fact that the conductive hearing impaired group did not differ from the normal in its adjustment. It aligned itself in between the normal and the sensory neural hearing group. The group shows a tendency towards normalisation being nearer to the normals in adaptability. This may be attributed to their dexterity in manipulating the environment so as to compensate their hearing loss.

The group centroids in Figure 1 indicated that the mentally retarded group arranges itself near the normal control group on this dimension manifesting a level of adjustment that is comparable with the normal hearing group. The fact that only moderate and mild mentally retarded children were included in the present study could be one probable reason for their good adjustment.

Dimension II - cognitive dimension

The normal control group and the experimental groups did not differentiate themselves on the cognitive dimension and the experimental groups are comparable with the control group on this dimension. Quite a few researchers have found no consistent differences in the scores of the deaf and the normal children on cognitive functions (Bolton, 1976; Graham & Shapiro, 1953; Karten, 1976).

T'e conductive hearing impaired group has not received the same attention as the sensory neural hjarirg impaired group since it is not easily recognizable (Bess, 1985). However, in the present study this group is also on par with the normal group on the cognitive dimension. Peckham, Sheridan & Butler (1972) and Pflaster (1976) report similar findings.

The meaning of subnormal level of cognitive functioning in the term mental retardation itself, is implicit. This group clearly distinguishes itself from the other three groups proving itself to be inferior on this dimension.

In a mentally retarded child, the deficit lies in the acquisition of knowledge. In case of the sensory neural hearing impaired group, one may presume that there is no retardation in the development of cognitive sequences and they are successful in reaching the level of development as their normal counterparts, except for the acquisition of language due to hearing impairment. This deficit does not detract them from normal development.

It can be noticed that a few other variables belonging to the affective dimension also contribute to this dimension. One reason for this could be that all the tools used in the present study were not factorially derived except the temperament schedule. It is a well known fact that the same factors may not emerge during factorially derived except the temperament schedule. It is a well known fact that the same factors may not emerge during factorial replications. This may be one of the reasons for the loading on these variables in this dimension. Several investigators have pointed that there is a close affinity between the cognitive and the affective dimension of an individual, and these dimensions are highly interdependent. Flavell (1985) very convincingly states that "the really interacting concepts of the world have the nasty habit of avoiding our most determined attempts to pin them down, to make them say something definite and make them stick to it. Their meanings perversely remain multiple, ambiguous, imprecise and above all unstable and open to arguments and disagreements. So it is with that concept called cognition"(p.2).

A number of investigators have attempted to broach the intriguing area of memory. Since the time of Ebbinghaus (1964), the concept of memory has been researched upon. According to Myklebust (1966), "virtually all behaviour entails memory" and memory is defined as the "ability to associate, retain and recall experience" (p.77). The span tests of memory have been used by researchers to arrive at a measure of immediate memory. Watkins (1980) notes that despite the immediate memory span being considered as valid measure of mental capacity, the paucity of research critically analysing the concept (memory span) renders it as elusive and vague as ever. Memory has been considered as a component of congnition by investigators like Flavell (1971), Kail and Hagen, (1982) and Sen (1988). In keeping with their view, the variable span for digits, has emerged with a high loading in the cognitive dimension during the present investigation. In the present investigation, except for the mentally retarded group, the sensory neural and conductive hearing impaired groups do not differentiate themselves from the normal control group. The same trend is noticed in the case of memory for designs and pattern for movements. The experimental groups had no difficulty to organise, retain and reproduce as required by the task.

According to Doll, (1953), Social Maturity is a measure of social competence which is the result of one's interactions with the society. In the present study, the social maturity variables had aligned itself with the cognitive dimension. This may probably indicate a close relationship between the cognitive and the social abilities of an individual. The findings of the present study are in agreement with the findings of other researchers who have failed to observe any difference in the level of social maturity of the hearing impaired (both sensory neural and conductive) as compared with the normal children (Dharithri, 1988; Meadow, 1968; Moses, 1972; Schlesinger & Meadow, 1971). Some of these researchers also tend to comment that the deaf children are normal in their social maturity and are able to score above normal when credit is allowed for any form of success for communication. The probable reason attributed by the authors is that the young deaf child is more on his own than the young normal child, and hence, he is forced to develop a more independent spirit. However, there are other researchers who opine differently based on their research findings and comment that the deaf are socially maladjusted (Evans, 1975; Quarrington & Solomon, 1975; Schuldt & Schuldt, 1972).

As a conclusion it can be stated that the sensory neural hearing impaired group manifests deficits in the affective dimension. The hearing impairment has a detrimental effect on the emotional development. Hence, it is imperative that the affective aspects be dealt with for their healthy growth and adjustment. The findings thereby give indications for habilitating and planning the modes of intervention for an effective functioning of the hearing impaired. However, it can be said that lack of adequate psychological instruments pose a major limitation in assessing the hearing impaired. A positive note by Pollard (1992-93) stating that "in the psycho educational field, assessment methods will improve" (p.44), brings new hope for those working with the hearing impaired.

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