

On  
ain  
ess  
our  
hat  
to

# Part III

## Summary and Appendices

## Summary

### Background to the study

There have been few follow-up studies of children with delay of speech development which have attempted to assess outcome in a systematic and comprehensive manner. A unique opportunity for undertaking this type of longitudinal follow-up occurred as a result of the Newcastle Child Development Study (Neligan *et al.*, 1974). In order to achieve this objective a series of preliminary simple steps were essential. First, we needed a definition of speech retardation: we decided to use the simple definition employed by the health visitors; this was the inability to use three or more words strung together to make some sort of sense by the age of 36 months. Second, it was necessary to select groups of children from a total population and to examine them at specified ages and by appropriate methods in order to identify the significant differences in their development. If such findings were to have wider validity it was essential for us to define the relationship between our study population and the total population from which it was drawn so that relevant comparisons could be made and conclusions drawn by workers located elsewhere.

The Newcastle Survey of Child Development enrolled survivors of the first month of life born in Newcastle during the years 1960-1962. This study gave us information, which had been collected by midwives, health visitors, doctors and teachers, about the children's first five years of life. This covered perinatal, obstetric and social data and also information about their health and development. Descriptions of the populations and other aspects of the study are provided in two previous publications (Neligan *et al.*, 1974, 1976).

In order to broaden the study it was decided to include a hearing-impaired sample as this comprises a major group of children who, as a result of their deafness, suffer from varying degrees of speech retardation. It was impractical to limit the identification of hearing-impaired children of a narrow age group to the city of Newcastle upon Tyne

alone, with its population of about a quarter of a million, as the prevalence of deafness is under two per 1000 children. Hence, in order to obtain a hearing-impaired sample which was statistically viable, it was necessary to recruit hearing-impaired children from the wider Tyneside area complex. This was facilitated by the co-operation of the regional child otologist.

As our aim is to provide the reader with a brief résumé of the contents of the book we have included in the summary only major themes, findings and related conclusions. Inevitably, therefore, some important themes will be found only on perusal of the full text.

## 1 Speech retarded children

### *Aims and objectives of study*

The aim of the study was to obtain a comprehensive picture of the intellectual, behavioural and physical functioning of children at school age who had an early history of speech retardation. At this stage of their development a wide range of reliable and valid assessments could be undertaken. The method described above would obviate the pitfalls associated with retrospective studies and the use of biased samples recruited from specialist clinics or hospitals. Further, we wished to study a total population of speech retarded children in a way and at a depth which we do not believe has been previously achieved by any other group of workers. It was also our intention to undertake a clinical and statistical classification of the children involved and to estimate the prevalence of their handicaps.

### *Method*

The progress of the children with speech delay was compared with that of a matched control group. The latter consisted of children who did not suffer from speech delay and who were matched individually with our study cases on three criteria—sex, age and family neighbourhood. However, in the comparisons between the subgroups and the controls matching was not maintained—the total control group was used for every comparison. This control group was also used for comparison with the hearing impaired sample.

The groups of children were compared on a variety of measures: speech and language, intelligence, educational achievement, behavioural and neurological assessment. We were also able to relate early social, family and medical factors to current functioning.

Of the 3300 children born in Newcastle upon Tyne in 1962, 133, which

constitutes 4% of the population of these, 102 were aged 7 years old.

### *Losses*

The remaining 31 children of this group were not included in the comprehensive assessment; in 10 cases the 29 surviving children were not included in this group was not included in the assessment; in 10 cases their families were not included in the study. We therefore have a broadly similar sample to that which has been made available for study.

### *Diagnosis and classification*

A summary picture of the functioning of the eight is presented in Table 1. The groups on a large scale are: (a) and educationally subnormal children were included in the assessment all children were included in the subgroups, with 17.6% of the children being retarded. The children with abnormal functioning in the area of language (autism, electively mute, etc.) (17.6%) of the children. The Residual Group (17.6%) of the children. They displayed a wide range of age of seven years and over.

A further classification was made on whether the children were severely or moderately retarded. They suffered from a wide range of handicaps, we identified the specific speech and language disorders.

constitutes 4% of the population, were identified as speech retarded. Of these, 102 were studied more intensively when they were seven to eight years old.

### *Losses*

The remaining 31 cases of the original 133 were not available for comprehensive study at school age: two had died; 21 cases had left the area; eight cases had to be excluded from detailed analysis because of insufficient data (see Chapter 1). However, the information available on the 29 surviving children showed that the rate of serious handicaps in this group was no greater than that of the group of children available for assessment; in addition, the distribution of occupational social class of their families tended to be slightly better than those who we were able to study. We therefore concluded that those not seen were likely to be broadly similar to those who were assessed. An appropriate adjustment has been made for these losses when estimating prevalence.

### *Diagnosis and classification*

A summary profile of the performance of the various groups (with the exception of the pathological deviant group) of children at age seven or eight is presented in Table I. This table shows the differences between the groups on a large number of measures of intelligence, language, speech and educational and behavioural performance. Furthermore, as the children were assessed clinically at the age of seven years our diagnostic assessment allowed us to classify speech retarded children into two broad subgroups, which we have labelled *pathological deviant* and *residual speech retarded*. The pathological deviant group consisted of children whose functioning intellectually, psychologically or physically was indubitably abnormal. It included children with severe disorders of communication (autism, elective mutism, dysphasia and dysarthria) and intellectual-cum-physical handicaps (cerebral palsy and subnormality). Some 18 (17.6%) of the 102 cases studied fell into the pathological deviant category. The Residual Speech Retarded Group comprised the remaining children. They displayed no obvious serious handicap on clinical assessment at the age of seven years.

A further clinical classification was undertaken. This was dependent on whether these children suffered from *speech retardation alone* or whether they suffered from *retardation of both speech and walking*. In short, we identified three subgroups: those who walked early comprised the specific speech delayed group; those who walked late comprised the

# 188 Speech Retarded and Deaf Children

Table I Summary of findings comparing control and study groups

Normal control group	Specific speech delayed group	Intermediate delayed group	General delayed group	Partial hearing group	Profoundly deaf group
Full-scale IQ (WISC)	—	—	—	—	X
<i>Non-verbal tests:</i>					
Perceptual quotient (Frostig)	—	O	—	—	—
Conceptual maturity (Harris' D-A-M)	O	O	—	—	—
Manual dexterity (Purdue pegboard)	O	O	—	X	X
Memory cards (Skemp)	O	—	—	X	X
Paired associates (Skemp)	O	—	—	X	X
Visual concepts (Skemp)	O	—	—	X	X
Auditory visual integration (Birch)	O	—	—	X	X
Haptic-visual integration (Birch)	O	O	O	X	X
Imitation of gestures	O	—	—	X	X
Picture completion (WISC)	O	O	O	O	—
Picture arrangement (WISC)	—	—	—	O	—
Block design (WISC)	O	—	—	O	—
Object assembly (WISC)	O	O	O	O	O
Coding (WISC)	O	O	—	O	O
Performance IQ (WISC)	O	O	—	O	—
Visual association (ITPA)	O	—	—	O	—
Visual closure (ITPA)	O	—	—	O	—
Manual expression (ITPA)	O	—	—	O	+
Visual sequential memory (ITPA)	O	—	—	O	—
Visual reception (ITPA)	O	O	—	—	—
<i>Verbal and language tests:</i>					
Information (WISC)	—	—	—	—	X
Comprehension (WISC)	O	O	—	—	X
Arithmetic (WISC)	O	—	—	—	X
Similarities (WISC)	—	—	—	—	X
Vocabulary (WISC)	—	—	—	—	X
Verbal IQ (WISC)	—	—	—	—	X

Normal control group	
Verbal expression (ITPA)	
Grammatical closure (ITPA)	
Auditory association (ITPA)	
Auditory sequential memory (ITPA)	
Auditory reception (ITPA)	
Language quotient (ITPA)	
Sound blending (ITPA)	
Auditory closure (ITPA)	
Vocabulary comprehension (EPVT)	
Simple sentence	
Simple-plus sentence	
Compound sentence	
Complex sentence	
Sentence complexity (Global score)	
Mean sentence length (Bus story)	
Information content score (Bus story)	
Incomplete sentences (Bus story)	
Reading quotient (Schonell)	
<i>Speech</i>	
Immature articulation score	
Correct articulation score	
<i>Behaviour/personality</i>	
Behaviour adjustment (Rutter scale B; Total score)	
Antisocial score (Rutter scale B)	
Neurotic subscore (Rutter scale B)	
Extraversion (JEPI)	
Neuroticism (JEPI)	
Lie scale (JEPI)	

+ significantly better than controls  
 O no significant difference from control  
 — significantly poorer than control  
 X no data available because test not used

Normal control group	Specific speech delayed group	Intermediate delayed group	General delayed group	Partial hearing group	Profoundly deaf group
Verbal expression (ITPA)	—	—	—	—	X
Grammatical closure (ITPA)	—	—	—	—	X
Auditory association (ITPA)	—	—	—	—	X
Auditory sequential memory (ITPA)	—	—	—	—	X
Auditory reception (ITPA)	O	—	—	—	X
Language quotient (ITPA)	—	—	—	X	X
Sound blending (ITPA)	—	—	—	X	X
Auditory closure (ITPA)	—	—	—	X	X
Vocabulary comprehension (EPVT)	—	—	—	X	X
Simple sentence	+	+	—	X	X
Simple-plus sentence	O	O	O	X	X
Compound sentence	O	—	—	X	X
Complex sentence	O	O	—	X	X
Sentence complexity (Global score)	—	—	—	X	X
Mean sentence length (Bus story)	—	—	—	X	X
Information content score (Bus story)	—	—	—	X	X
Incomplete sentences (Bus story)	O	—	—	X	X
Reading quotient (Schonell)	—	—	—	O	—
<i>Speech</i>					
Immature articulation score	—	—	O	X	X
Correct articulation score	—	—	O	X	X
<i>Behaviour/personality</i>					
Behaviour adjustment (Rutter scale B: Total score)	O	O	—	O	—
Antisocial score (Rutter scale B)	O	O	O	O	—
Neurotic subscore (Rutter scale B)	O	O	O	O	O
Extraversion (JEPI)	O	—	—	X	X
Neuroticism (JEPI)	O	O	O	X	X
Lie scale (JEPI)	O	O	O	X	X

+ significantly better than controls  
 O no significant difference from controls  
 — significantly poorer than controls  
 X no data available because test not administered

## 190 Speech Retarded and Deaf Children

general delayed group; and those whose walking milestones were average comprised the intermediate group. Such simple subcategorizations have served to underline the heterogeneity of problems which are likely to be found amongst children who were previously speech retarded.

### *The value of a simple speech screen at the age of three years*

The predictive value of this simple screen is fully described in Chapter 1. Of the 4% of children in the population identified as speech retarded, one in five was later found to be suffering from some serious language and intellectual or physical handicap and these constitute the pathological deviant subgroup. We initially thought that the remaining children (the Residual Speech Retarded Group) could be considered as falling into the so-called developmental speech disorder category. However, this proved to be mainly true of the children found to be suffering from specific speech delay.

### *Prevalence—incidence of disorders*

As many of the conditions which we have studied were very rare and indeed only manifested in one or two cases in our sample, our conclusions regarding the prevalence of those conditions must be very tentative.

It has also been pointed out that precise figures for the number of children with speech and language disorders are difficult to obtain and that more data are needed. Our data, which were epidemiologically based, may contribute to a more accurate estimate of the incidence of some of the language disorders. As we were unable to interview about 25% of the children identified by our screen we have corrected our estimates by multiplying our speech disorder rates by a factor of 1.30.

We found that retardation of speech among three-year-olds is a relatively common problem which affects 4% of the population of Newcastle upon Tyne. Such a figure is broadly in agreement with the earlier findings of Morley (1965) in the same region of England, and with the national figures quoted for the USA by Marge (1972). We also report a crude prevalence rate of 0.8 per 1000 children for autism which is consistent with the findings from other studies (Lotter, 1966) but a prevalence of 0.4 per 1000 children for elective mutism and severe childhood dysphasia respectively, which suggests that the two latter conditions are as rare as, or perhaps even rarer than, infantile autism. The rarity of these conditions may well explain the absence of detailed information about their features and aetiology.

### *Influence of*

We had att  
the groups  
the same a  
sociologica  
of adverse  
Retarded (C  
therefore t  
partially su  
urban area  
handicap a  
Residual S  
problems.  
issues we f  
tensions a  
already de  
disturbanc  
speculate t  
for workin

Quantita  
no differen  
study of sp  
there is any  
an excess of  
Retarded (C  
importance  
there is a c  
subgroup c

### *Predictive*

Compared  
Residual Sp  
impairmen  
tional func  
These diffe  
environmen  
for such fac  
slight down  
statistically

However  
we have lal

*Influence of socio-cultural factors*

We had attempted to control occupational social class differences between the groups by matching each speech retarded child with another child of the same age and sex and from the same neighbourhood. However, when sociological factors were studied in depth it was found there was an excess of adverse socio-cultural indices in the case of the Residual Speech Retarded Group as compared with the control group. Our attempts therefore to control for social class and environmental factors were only partially successful. We therefore concluded that even within the same urban area or neighbourhood there was a relationship between child handicap and adverse social factors. In addition, the mothers of the Residual Speech Retarded Group had high rates of serious psychological problems. After a careful examination of the relationships and relevant issues we further concluded that these were more likely to be a reflection of tensions associated with the greater loadings of adverse social factors already described. We were surprised by the low rates of serious disturbance reported by the mothers of the pathological deviant group. We speculate that special facilities for care of these children and opportunities for working may have protective or modifying influences.

Quantitative assessment of mother's speech was also undertaken and no differences were found between groups on a variety of measures. In a study of speech disorders of childhood it is important to ascertain whether there is any evidence of a family history of similar problems. We identified an excess of such problems in the case of the parents of the Residual Speech Retarded Group and we consider that this confirms the aetiological importance of such factors. Such evidence gives rise to the hypothesis that there is a developmental component with a familial basis in at least a subgroup of the Residual Speech Retarded Group.

*Predictive importance of speech delay*

Compared with their normal peers (that is with the control group), the Residual Speech Retarded Group was shown to have varying degrees of impairment in the areas of speech, language, intellectual and educational functioning and also to be more poorly adjusted in behaviour. These differences cannot be attributed solely to differences in social environment because we had controlled as far as possible by matching for such factors; hence while the Residual Speech Retarded Group had a slight downward gradient of occupational social class this was not at all statistically significant.

However, the more sensitive measure of social environment, which we have labelled the social risk index, did show significant differences



between the groups. It was therefore necessary to determine whether such a factor made any important independent contribution to the poor performance of the Residual Speech Retarded Group as compared to the controls. We checked this by means of a partialling out technique in relation to 13 measures of performance and found that when we made allowance for the influence of social factors as represented by the social risk index, the picture for practical purposes remained largely unchanged in the case of the total Residual Speech Retarded Group, and virtually unchanged in the case of the specific speech delayed subgroup in comparison with the control group. We therefore concluded that differences in social environment between the speech and control groups were not sufficient to significantly affect outcome.

The results of the cognitive tests are best summarized by study of the principal component analysis. Here we found that the cognitive functioning of the Residual Speech Retarded Group differed significantly from the control group on the first two components. On the first component, which we termed 'general cognitive ability' the Residual Speech Retarded Group obtained an inferior score and hence as a group has a poorer level of general intellectual ability. On the second component, a bipolar one which we termed 'perceptual-motor ability' versus 'verbal ability', the Residual Speech Retarded Group differed from the control in that the mean scores of the former group tended towards the 'perceptual-motor' pole of the bipolar component and away from the 'verbal ability pole'. We conclude, therefore, that as a group, the Residual Speech Retarded children not only had a comparatively lower level of general intellectual ability but their tendency was to rely more heavily on visuo-motor skills rather than verbal-symbolic skills. Such differences in performance between the Residual Speech Retarded Group and the control group are consistent with expectations and underline important differences between their cognitive style.

Various tests of those subgroups identified on the basis of their speech and walking milestones showed that they differed from the controls in some important respects. The intellectual performance of the specific speech delayed group (i.e. those who walked early) was broadly similar to that described as being characteristic of children considered to be dysphasic (Olson, 1961; Weiner, 1972). These findings therefore provide circumstantial evidence that our group of children with a specific delay in speech had previously suffered from a type of developmental dysphasia. Other circumstantial evidence in support of this hypothesis is as follows: children in the specific speech delayed group were found to have a good non-verbal IQ in contrast to their relatively poor grammatical abilities, vocabulary, comprehension and expression of ideas and poor reading attainment, poor word sound (phoneme) discrimination and immaturity of articulation of speech. On the other hand, the occupational social class of

the breadwinners of their normal limits. Our speech the less severe disorder syndrome considered to be delayed group and non-verbally so in speech.

Our findings of retardation of this is not a new speech retarded units of word constitute one difficulties of t

The finding that display significant achievement is parents. It implies are likely to require school age or earlier behaviour is likely with more severe found is that of similar to that of with speech at

#### *Multivariate analysis*

The main aim inter-correlation retarded child McQuitty's (1961) identified which considerable in children who finding of this measure of vocabulary (Test) which covers the majority of which includes mainly associated with the child. Variables

the breadwinners did not significantly differ from that of the breadwinners of their normal peers and the hearing of these children was within normal limits. Our specific speech delayed group therefore appears to represent the less severe end of the spectrum of the developmental language disorder syndrome described by Ingram (1972) in which the prognosis is considered to be reasonably good. In contrast, the children in the general delayed group were found to be grossly retarded in their language, verbal and non-verbal intelligence and educational attainments, but not significantly so in speech articulation.

Our findings also emphasize the important relationship between earlier retardation of speech and subsequent impairment in reading, although this is not a new finding (Ingram, 1972). Furthermore, both subgroups of speech retarded children showed impaired ability to discriminate between units of word sounds. We therefore postulate that such defects may constitute one of the important basic mechanisms underlying the reading difficulties of these groups.

The finding that a high percentage of residual speech retarded children display significant impairment of intelligence, language and educational achievement is of major importance to clinicians, educationalists and parents. It implies that children who had speech delay in early childhood are likely to require careful assessment and appropriate remedial action at school age or even earlier. In addition, the prognosis in terms of disturbed behaviour is likewise poor but particularly so in the case of those children with more severe degrees of speech disorders. The pattern that has been found is that of introversion and withdrawal, and is, with some exceptions, similar to that often described in the literature as characteristic of children with speech and language disorders.

#### *Multivariate analyses*

The main aim of the multivariate analyses was to investigate the inter-correlations of some of the basic data on our group of residual speech retarded children. The first technique used for this purpose was McQuitty's (1957) technique of cluster analysis: here one main cluster was identified which we labelled a cognitive cluster. The cluster illustrates the considerable importance of a subsequent comprehension deficit in children who were previously speech retarded. The most important finding of this cluster analysis is the central and pivotal nature of the measure of vocabulary comprehension (the English Picture Vocabulary Test) which correlates significantly, though not necessarily highly, with the majority of the remaining variables. There is in addition a subcluster which includes the variable language literacy index of the mother; this is mainly associated with a fairly high level of immature errors of articulation in the child. Various explanations are offered for this correlation.

## 194 Speech Retarded and Deaf Children

Factorial analysis was undertaken on data based on the Residual Speech Retarded Group. Our findings indicate a contrast between, on the one hand, good verbal abilities of the child (articulation, vocabulary and grammar), good language ability of mother and positive social environmental influences, and on the other hand, uneven physical maturation associated with relatively good non-verbal intellectual abilities (see Chapter 7). These and other findings lead us to two conclusions. First, that social and environmental stimulation may be important facilitators of the development of speech, language and verbal abilities. Second, that poor early speech development accompanied by satisfactory motor milestone development does not necessarily give rise to a poor intellectual outcome. This is particularly true of practical abilities. Furthermore, the findings described above also constitute support for the notion of a specific developmental speech/language disorder syndrome.

### *Sex differences*

The male:female ratio for our total speech retarded group was 1.7:1. When the Residual Speech Retarded Group and the pathologically deviant group were analysed separately, the male:female ratio was 2:1 for the former and 1:1 for the latter. The former is in broad agreement with the findings in most of developmental disorders where male:female ratios are in the order of 2:1 to 3:1.

## 2 Hearing-impaired children

In collaboration with the University-based child otologist who provided a regional reference service for Tyneside, a total of 59 hearing-impaired children were identified. The control group used in the study of speech retarded children were again used as controls for our study of hearing-impaired children. As the children in the hearing-impaired group were a year older than those in the control group comparisons had to be made with caution. However, age-corrected tests were usually employed, which in the circumstances, allow as far as is possible valid comparisons.

### *Diagnosis and classification*

As with the speech retarded group, clinical assessments were undertaken in order to identify a pathologically deviant group of children.

(a) *Pathologically deviant hearing-impaired group* This was a smaller group than anticipated, consisting of one severely subnormal child,

three brain-  
(b) *Hearin*  
group comp  
sufficiently  
testing. The  
hearing (21  
discussion t

### *Social and fa*

The occupati  
did not sign  
significant e

In contrast  
with regard  
complicated  
more than th  
also major ir  
the two subg  
group had su  
hearing grou  
with the cont  
more likely to

Some of t  
psychological  
stress of hav  
deaf children  
'nervousness'  
highest incid  
hearing child  
residential sel  
suggest that t  
in the way of  
child, and this  
a finding may

We can sur  
follows: in th  
usually than t  
case of the c  
Furthermore,  
the parents of  
child, these pa  
of the control g

three brain-damaged or spastic children and one with a cleft palate.

(b) *Hearing-impaired children without significant organic impairment* This group comprised the remaining 54 children who were functioning sufficiently well in their school settings to be able to respond readily to testing. These children were divided into two subgroups: the partially hearing (21 cases) and the profoundly deaf (33 cases). We confine our discussion to the above 54 cases.

#### *Social and family background*

The occupational social class of the parents of the hearing-impaired group did not significantly differ from the control group, nor was there any significant excess of other indices of social and family pathology.

In contrast, comparison of the hearing-impaired and control groups with regard to difficulty in early development revealed a somewhat complicated picture. The hearing-impaired group had suffered from more than the usual number of minor fevers (measles, mumps, etc.) and also major infections (meningitis/encephalitis). On the other hand, of the two subgroups of hearing-impaired children, the profoundly deaf group had suffered significantly more postnatal illness than the partially hearing group and also a significant excess of epileptic fits compared with the control group. In profoundly deaf children such illnesses were more likely to occur in the first five years of life.

Some of the more striking findings related to the attitudes and psychological reactions of parents of deaf children. Despite the apparent stress of having a child with severe deafness, mothers of profoundly deaf children were found to have a lower incidence of treatment of 'nervousness' than mothers of normal hearing children; in contrast, the highest incidence of 'nervousness' was noted in mothers of partially hearing children. As most of the profoundly deaf children attended residential schools, and the majority of partially hearing did not, we suggest that the mothers of the profoundly deaf did not have as much in the way of daily stresses associated with attending to a handicapped child, and this may be the basis of their lower levels of 'nervousness'. Such a finding may constitute an argument in favour of residential schooling.

We can summarize the salient differences of parental attitudes as follows: in the case of the hearing-impaired group the mother more usually than the father assumed the disciplinary role, whereas in the case of the control group it was usually the father who did so. Furthermore, despite the greater strictness and supervision shown by the parents of the hearing-impaired group towards their handicapped child, these parents had fewer expectations of their child than had those of the control group, and this was particularly evident in the case of the

profoundly deaf group. Our findings suggest a greater degree of over-protection in the parents of the hearing-impaired children. Such attitudinal differences may be important determinants of the slower social maturation of hearing-impaired children compared with normal hearing children which is often reported in the literature (Myklebust, 1964).

The amount of communication between parents and their deaf children appeared to be related to the severity of their deafness. In addition, there were differences in the type of communication in that the parents of the profoundly deaf children were more inclined to use baby talk with their children.

#### *Non-verbal cognitive abilities*

The non-verbal cognitive attainments of the hearing-impaired group were found to be significantly poorer than those of the normal control group. Moreover, the mean scores of the hearing-impaired group were usually nearer to those of the Residual Speech Retarded Group than to those of the control group. These results were consistent for a variety of such cognitive tests, namely, the Draw-a-Man Test of conceptual maturity, the Frostig Developmental Test of Visual Perception, the non-verbal subtests of the Illinois Test of Psycholinguistic Ability and the performance subtests of the Wechsler Intelligence Scale for Children. This trend of differences between the three groups was also found on the principal component analysis with regard to the first component, which measured non-verbal intelligence: the hearing-impaired did worst, the controls best and the Residual Speech Retarded Group obtained an intermediate score.

It is argued that it would be an oversimplification, if not erroneous, to conclude that the hearing-impaired are 'less intelligent' than their hearing counterparts. It is more useful to consider the findings on the second component of the principal component analysis. On this bipolar component of 'visual symbolic ability' versus 'motor ability' the mean score of the hearing-impaired group falls at the 'motor pole', that of the controls at the 'visual symbolic pole' and that of the Residual Speech Retarded Group in between. This suggests that there are differences in cognitive style between the groups of children studied.

#### *Subclassification of hearing-impaired group and profile of abilities*

The division of the hearing-impaired group into profoundly deaf and partially hearing subgroups according to whether they attended a school

for the profo  
the importan  
severity of h

Compared  
almost alwa  
while the pa  
expression) t  
the other thr  
the performa  
the normal c  
of the Resid

Compared  
and the par  
foundly deaf  
when compa  
deaf group v  
highlighted  
deaf group o  
on a test of r  
language use  
meaningful t  
our findings  
important fac  
tional perfor

The partial  
their profou  
better than th  
hearing in m

#### *Behaviour an*

Some of the  
first sight ap  
impaired grou  
compared wit  
tions for these  
important fin  
more serious  
and the partic  
school appear  
main type of n  
an antisocial

for the profoundly deaf or a school for the partially hearing highlighted the importance of distinguishing between children with differences in severity of hearing loss, albeit on the basis of a simple classification.

Compared to the normal control group the profoundly deaf group almost always scored significantly worse on the cognitive tests used while the partially hearing group did not. On one subtest alone (manual expression) the profoundly deaf group did score significantly better than the other three groups. In contrast, on the majority of non-verbal tasks the performance of the partially hearing in many ways resembled that of the normal control group and in some cases proved to be better than that of the Residual Speech Retarded Group.

Compared with those of the control, the Residual Speech Retarded and the partially hearing groups, the test performances of the profoundly deaf were in general worse (and almost always significantly so when compared to the control group). A characteristic of the profoundly deaf group was the patchiness of their subtest scores. This was clearly highlighted on the ITPA (visuo-motor tests only) where the profoundly deaf group obtained a superior subtest score over the other three groups on a test of manual expression. It would seem that where the mode of language used is more concrete—in that it involved manual gesture—and meaningful to the child then hearing loss is no impediment. Nevertheless, our findings suggest that, in the main, severity of hearing loss is an important factor which contributes to the poorer intellectual and educational performance of hearing-impaired children.

The partially hearing group showed a clear trend of superiority over their profoundly deaf counterparts, and in some instances did even better than the Residual Speech Retarded Group. In short, the partially hearing in many ways resembled the normal control group.

#### *Behaviour and personality*

Some of the findings based on two different sources of information at first sight appear contradictory. While the parents of the hearing-impaired group report less in the way of neurotic and antisocial behaviour compared with the control group, teachers report more. Possible explanations for these differences are discussed in Chapter 11. There are two other important findings: the first is that the profoundly deaf children display more serious maladjustment (on the Rutter teacher's scale) than the control and the partially hearing children; hence, severity of maladjustment in school appears to be related to degree of deafness. The second is that the main type of maladjustment shown by the profoundly deaf in school is of an antisocial rather than a neurotic variety.

## 198 Speech Retarded and Deaf Children

On the basis of parents' reports, it is mainly in terms of social maladjustment that the hearing-impaired group show excesses compared with the control group. Again, it is the profoundly deaf group who show the poorest adjustment. Finally, significantly greater degrees of irregularity are reported for both the hearing-impaired groups, and a significantly greater degree of moodiness for the partially hearing group alone.

We offer the tentative explanation that the partially hearing group is inclined to vent their psychological frustrations in moodiness whereas the profoundly deaf are likely to resort to antisocial behaviour. Other possible psychological and organic explanations are offered in Chapter 11. It is evident that the behaviour of the hearing-impaired children tends to be situation-specific.