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I.

A SURVEY OF THE PHYSICAL AND MENTAL STATUS
OF CEREBRAL PALSIED EUROPEAN CHILDREN AT
SCHOOL IN THE UNION OF SOUTH AFRICA

II.

A SURVEY OF THE ADULT WITH CEREBRAL PALSY

C. H. DE C. MURRAY

NATIONAL BUREAU OF EDUCATIONAL AND SOCIAL RESEARCH
DEPARTMENT OF EDUCATION, ARTS AND SCIENCE

1959

RESEARCH SERIES NO. 4

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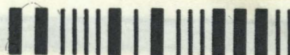
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FOREWORD

This Survey of the Physical and Mental Status of Cerebral Palsied European Children at school in the Union of South Africa, was undertaken in 1957. The Questionnaires were distributed in June, 1957. The last of the replies reached the Bureau towards the end of April, 1958.

While Dr. C. H. de C. Murray was Principal Professional Officer (Education and Surveys) in the Bureau he was asked to undertake the Survey. Previously he had been the principal of the Pretoria School for Cerebral Palsied Children. He had also spent a year in the United States of America on a Fellowship of the Commonwealth Fund studying cerebral palsy programmes. Accordingly when, in October, 1957, he left the Bureau to take up an appointment as Inspector of Psychological Services in the Department of Education, Arts and Science, of which the National Bureau of Educational and Social Research is a subdivision, it was felt that he should be asked to complete this study of the cerebral palsied children, especially since the Bureau had no one else with the specialised knowledge of cerebral palsy who could be asked to take over the Survey.

The Department released Dr. Murray from most of his duties as Inspector of Psychological Services during October and part of November, 1958, during which period he analysed the data, and wrote the report on this Survey, which is now presented.

The purpose of this Survey was to obtain factual information about the cerebral palsied children at school, and, to a limited extent, about adults with cerebral palsy. The way is now open for a comparison with findings in other countries.

P. M. ROBBERTSE, *Director*
National Bureau of Educational and Social
Research,
Department of Education, Arts and Science

6th February, 1959

The unexpected demand for this report has caused the Bureau to issue a reprint. A few errors which had slipped into the previous edition have been corrected in this one.

P. M. ROBBERTSE, *Director*
National Bureau of Educational and Social
Research
Department of Education, Arts and Science

PRETORIA,
September, 1960.

CHAPTER I

THE SCOPE OF THE SURVEY, AND THE METHOD EMPLOYED

1. During 1957 the National Bureau of Educational and Social Research was requested by the National Council for the Care of Cripples in South Africa to undertake a research project which the National Council for the Care of Cripples formulated as follows:

“Define the problem of the employment of European cerebral palsied persons in South Africa, with specific reference to the children currently at school, and the expectation of their employment potential and needs, when they are ready to leave school.”

2. The Secretary for Education, Arts and Science, after due consideration of such factors as costs and time involved, approved a survey which would primarily be directed at gaining information on schoolgoing cerebral palsied European children, and which could be conducted by means of a questionnaire. In so far as the National Council for the Care of Cripples in South Africa, and its affiliated Associations could provide the information, there would be no objection to information being collected about the cerebral palsied adult. This, however, would not be the main purpose of the Survey.

3. The project was formulated as follows:

“A survey of the physical and mental status of cerebral palsied European children at school in the Union of South Africa.”

4. The Survey would attempt to glean information about their numbers, age, sex, home language, cerebral palsy diagnosis, limbs involved, degree of disability, certain personality traits, intellectual ability, and scholastic status.

5. A Questionnaire Form was constructed, entitled: *Survey of Cerebral Palsied Persons*. (See Appendix A.)

(1) In the preamble there was space for the child's name, sex, home language, date when Questionnaire was completed, date of birth, age, and school address.

(2) Thereupon followed the following subdivisions:

Part I: Diagnosis, which covered eight *clinical signs*; the *extremities* involved; and the *severity* of the disability.

There was no particular reason for using this nomenclature in preference to other nomenclature used by some other writers on cerebral palsy, excepting that the terms “spasticity, athetosis”, etc., are well known to workers in the field.

A medical officer at one of the schools for cerebral palsied children protested against the terminology used to describe the extremities involved. It was submitted that “plegia” denoted palsy or paralysis and was therefore applicable only in the spastic group, implying

an Upper Motor Neuron Lesion. This being the case, this medical officer experienced the greatest difficulty in applying these terms to *firstly* the Athetoid group in which there are excessive movements but no true paralysis, and *secondly* in the mixed Athetoid-spastic group where one commonly finds, for example, one spastic extremity in a case where athetosis involves musculature of face, neck, trunk and limbs. This medical officer would have found simpler terms, e.g. involvement of one or both upper and/or lower extremities and a statement on type of involvement more acceptable. Despite these objections to the terminology this medical officer very kindly did complete the whole of each questionnaire.

This kind of objection to terminology is commonly experienced in cerebral palsy work. At a recent international meeting of medical authorities on cerebral palsy no two specialists agreed on terminology!

The terminology employed in the form to indicate the extremities involved is commonly used by many medical workers in the field of cerebral palsy. The terminology was chosen after consulting a few South African paediatricians who are actively working with cerebral palsy schools.

However, a study of the data on the extremities involved as presented in Chapter 3 shows that quite a number of Questionnaires of non-spastic cases were not completed under the heading of *Extremities*. This *might* indicate that other medical officers experienced the same difficulty referred to above.

With the benefit of the hindsight thus gained, it seems that it might have been better to have avoided the terminology which was used, and to have used the simpler descriptive terms suggested.

The severity of the disability is defined in the Schedule of Instructions, page 1 (Appendix B.). The purpose here was to get a classification of the child's disablement in terms of his total physical functioning.

- (3) *Part II:* Acknowledgement is due to a form, the "Survey of Degree of Physical Handicap,⁽³⁾" by Dr. E. Katz of San Francisco, the main portion of which was incorporated in this Questionnaire as Part II. This is a rating scale according to which the absence, or presence and degree of physical disabilities in the areas of *Vision, Hearing, Speech* (verbal), *Sitting Balance, Arm-Hand Use, and Walking*, are marked according to a four point scale:—*Minimal, Mild, Moderate, Severe*.

Dr. Katz prepared brief descriptive material in each category to facilitate the classification of the child concerned. Dr. Katz's additional descriptions for each category were also included in a "Schedule of Instructions" which accompanied the questionnaires. (See Appendix B.)

- (4) *Part III: Personality Reactions*

The desirability of gleaned information on the personality reactions of the cerebral palsied child was strongly felt. All schools are expected to keep Cumulative Record Cards (Ed. Lab. 1) for all pupils. Part of these Cumulative Record Cards pertain to personality traits, which are rated on a five-point scale. It was decided to select four of these traits, namely, *Persistence, Disposition, Sociability, and Concentration*, and to condense the five-point scale to a four-point scale so that it could be in accordance with a clear cut dichotomy of "non-handicapping" and "handicapping". The rationale for the inclusion of rating scales on these personality traits was briefly this:—These traits can be recognized in very

young cerebral palsied children. The presence in a positive degree of these traits in cerebral palsied children is essential if progress in the therapy and school programmes is desired. Each category contained brief descriptive material to facilitate uniform rating procedures.

- (5) Part IV on *Intelligence* rating, and Part V on *Schooling* followed. These are discussed in detail in the relative chapters further on.

The various categories covered by the Questionnaire were arranged in such a way that a minimum of writing was entailed. The relative information could mostly be provided by marking the "appropriate block with 'X' ". All this was arranged on a single sheet 13 in. x 18 in. in size. A stencil was cut, and as many copies of the Questionnaire as were needed were duplicated.

6. A *Schedule of Instructions* containing definitions of the meanings attached to specific terms, and instructions on how the Questionnaire should be completed, accompanied the Questionnaires. The Schedule of Instructions may be seen in Appendix B.

7. All cripple care societies, central government and provincial government departments which were known to provide schooling for cerebral palsied children were circularised and their help enlisted. On receipt of favourable replies, the Questionnaires were sent out.

8. Returns were received from the following centres:

- (1) The Pretoria School for Cerebral Palsy Children, Pretoria.
- (2) The Johannesburg School and Treatment Centre for Cerebral Palsy Children, Forest Town, Johannesburg.
- (3) The Eastern Province School for Cerebral Palsy Children, Port Elizabeth.
- (4) The Cape School for Cerebral Palsy Children, Rondebosch, Cape Town.

These four schools have primary and pre-school classes for cerebral palsied children as well as a complete therapy programme. They are subsidised by the Department of Education, Arts and Science.

- (5) The Elizabeth Conradie School, Kimberley.
- (6) The Vocational High School for Boys, Kimberley.

These are two special schools for physically handicapped children under the Department of Education, Arts and Science. The Elizabeth Conradie School is a co-educational primary and high school. The Vocational High School for Boys is, as its name indicates, a vocational high school where physically handicapped boys are taught a variety of trades.

- (7) The Natal Provincial Cripples' Care Association, procured data on cerebral palsied children in the Uplands Government School at Swartkopskloof near Pietermaritzburg, Boys Model School (1 pupil), Peter Pan Occupation Centre (1 pupil), Longmarket Street School (1 pupil), all in Pietermaritzburg, and the St. John's Class for Cerebral Palsy in Durban. The St. John's Class for Cerebral Palsy meets twice a week and functions as an occupation centre, not a school. The Open Air Government School in Frere Road, Durban, also sent in completed forms. All these forms from Natal were taken as a collective group, total: 46.

- (8) The Meerhof School (Transvaal Education Department) which operates in conjunction with the Meerhof Children's Hospital, P.O. Hartebeespoort, also co-operated.
- (9) The O.F.S. Society in aid of Crippled Children, Bloemfontein, sent in 19 completed Questionnaires.
- (10) The East London and Border Society for the Care of Cripples, East London.

9. Unfortunately the group of Questionnaires (8) which were sent in from the East London area were not satisfactorily completed. They came too late to be returned to the centre with a request for additional and more complete data, and were consequently eliminated.

A few Questionnaires amongst those received from the schools and societies listed above were about children who were not cerebral palsied, e.g. microcephaly. They, too, were rejected.

10. The forms were carefully studied, and where necessary, and feasible, they were returned to the school concerned together with a letter asking precise questions about points needing clarity, or requesting information inadvertently not supplied.

For instance, Questionnaires from one centre contained diagnoses of rigidity in 11 cases out of 23, which is an unusually high incidence of rigidity. A letter was addressed to the school enquiring whether the doctor who had diagnosed the children had differentiated between spasticity due to a lesion of the pyramidal tract, and rigidity due to a lesion of the basal nuclei. The centre was good enough to have each child, whose diagnosis had been queried, re-examined by a specialist. This resulted in changed diagnoses which were then entered on the relative Questionnaires.

11. A total of 380 Questionnaires were finally submitted to analysis, even although they were not all complete in all details. For instance quite a number did not submit any information on schooling. These were eliminated when that subject was considered. Similarly Questionnaires lacking information on other topics under analysis were discarded for those particular topics where such a step was advisable and permissible.

12. *Analysis of the data*

The various categories on the Questionnaire were coded and the data punched on Hollerith cards by the Statistical Division of the National Bureau of Educational and Social Research. Tabulations were then carried out by Hollerith machine. Statistical procedures were computed by the author and checked in the Statistical Division.

13. In the chapters which follow, the data considered under the following headings:— Composition of the sample; The physical disabilities; Personality traits; Intelligence; School status; Conclusion.

14. Since the National Council for the Care of Cripples in South Africa was desirous of obtaining information about the employment of the adult with cerebral palsy, the Bureau undertook the collation of data on these adults with the proviso that the information should be readily available to Cripples' Care Associations which would be asked to complete a questionnaire entitled "Survey of Cerebral Palsied Adults". (Appendix C.) This would be subsidiary to the major survey of the cerebral palsied school children. The results of the survey of the adults are reported in Chapter 8.

CHAPTER 2

COMPOSITION OF THE SAMPLE

1. In Chapter 1, paragraph 8, a list and description of the centres which returned completed Questionnaires is given. These were also the centres which indicated initially that they were able and willing to co-operate in the Survey.

2. Appreciation must be expressed of the wholehearted co-operation which was received from the schools and the Cripples' Care Societies. They made every effort to supply accurate, up-to-date and reliable information.

3. It is known that there are cerebral palsied children not covered by this Survey, for instance, 8 children from East London whose Questionnaires could unfortunately not be used. Some children are not in schools either because they are too young, or because they are ineducable; others are scattered throughout the ordinary day schools of the provincial school systems. These apparently do not need the specialised education offered by cerebral palsy schools. Others may be prevented from attending schools by geographical factors and other personal reasons.

4. The 380 cerebral palsied children covered by this Survey represent the total population of cerebral palsied children in the four subsidised cerebral palsy schools and the two government schools for physically handicapped children of the Department of Education, Arts and Science, together with cerebral palsied children in the few other provincial schools in South Africa which do cater for them under special circumstances in conjunction with other physically handicapped children. A small group of cerebral palsied children not at school are also included. Strictly speaking pre-school children do not belong in a formal "school". In South Africa, however, the rehabilitation of cerebral palsied children is seen as a task starting as soon as cerebral palsy is diagnosed in the infant. The earlier the better. Accordingly all four schools for cerebral palsy children take children of preschool age, that is approximately 3-5 years, so that they may undergo the socialising experience of group life in a pre-school group, as well as having the benefit of the therapies.

5. *Number, sex, and home language of cerebral palsied children*

Table 1 summarises the data on number, sex and the home language of children with cerebral palsy in the Survey.

Table 1: SEX AND HOME LANGUAGE

Home Language	Male	Female	Total	%
Afrikaans.....	122	82	204	53·7
English.....	94	74	168	44·2
Other Language.....	5	2	7	1·8
Unspecified.....	1	0	1	0·3
TOTAL.....	222	158	380	100·0

Table 2 (a): DISTRIBUTION OF 380 CEREBRAL PALSIED CHILDREN ACCORDING TO AGE, SEX AND CEREBRAL PALSY CLASSIFICATION

Age in years	Spastic		Athetoid		"REST"								Total		Total	"Rest"	
	M	F	M	F	Rigid		Ataxia		Br. Inj.		Mixed		M	F	M+F	M	F
					M	F	M	F	M	F	M	F					
1.....	1	1	—	—	—	—	—	—	—	—	—	—	1	1	2	—	—
2.....	3	—	3	—	—	—	—	—	—	—	1	—	7	—	7	1	—
3.....	5	3	2	—	—	—	—	—	1	1	—	—	8	4	12	1	1
4.....	2	4	4	1	—	—	1	—	4	—	1	—	12	5	17	6	—
5.....	6	6	5	2	—	—	—	1	2	1	2	2	15	12	27	4	4
6.....	6	7	2	—	—	—	—	1	1	—	3	2	12	9	21	4	2
7.....	10	13	3	4	—	—	1	1	—	2	2	1	16	21	37	3	4
8.....	10	6	1	—	—	—	1	1	1	—	1	4	14	11	25	3	5
9.....	10	11	1	4	—	—	—	2	1	—	1	—	13	17	30	2	2
10.....	11	6	5	—	—	—	1	—	—	—	6	2	23	8	31	7	2
11.....	8	5	4	2	—	—	1	1	2	1	—	2	15	11	26	3	4
12.....	6	8	4	—	—	1	2	2	—	—	1	1	13	12	25	3	4
13.....	10	7	7	2	—	—	—	—	—	—	2	2	19	11	30	2	2
14.....	5	7	—	1	—	—	—	1	—	—	1	3	6	12	18	1	4
15.....	5	5	3	1	—	—	—	—	—	—	—	—	8	6	14	—	—
16.....	11	7	1	—	—	—	—	—	—	—	—	—	12	7	19	—	—
17.....	4	2	—	—	—	—	1	—	—	—	—	—	5	2	7	1	—
18.....	5	4	1	—	1	—	—	—	—	—	—	1	7	5	12	1	1
19.....	3	1	1	—	—	—	—	—	—	—	—	—	4	1	5	—	—
20.....	5	—	—	—	—	—	—	—	—	—	—	2	5	2	7	—	2
21.....	5	1	1	—	—	—	—	—	—	—	1	—	7	1	8	1	—
TOTAL....	131	104	48	17	1	1	8	9	12	5	22	22	222	158	380	43	37
% of Total..	34.5	27.4	12.6	4.5	0.26	0.26	2.1	2.4	3.1	1.3	5.8	5.8	58.4	41.6	100	11.3	9.7
% of Sex Group...	59.0	65.8	21.6	10.8	0.5	0.6	3.6	5.7	5.4	3.2	9.9	13.9	100	100	—	19.4	23.4
Mean.....	11.27	10.78	9.98	9.62	18.5	12.5	10.63	10.28	6.67	7.1	9.50	11.45	10.87	10.61	10.76	9.13	10.58
S.D.....	5.06	4.30	4.72	3.20	—	—	3.63	2.66	2.73	2.66	4.03	4.38	4.99	4.15	4.63	4.14	4.04
Median...	11.18	10.17	10.60	9.37	—	—	11.00	9.75	5.50	7.25	10.00	11.00	10.56	9.94	10.39	8.83	10.25
SDM.....	.44	.42	.68	.78	—	—	—	—	—	—	—	—	—	—	—	.63	.66

There are 380 cerebral palsied children, of whom 222 (58.4%) are boys, and 158 (41.6%) are girls; 204 (53.7%) have Afrikaans as home language, 168 (44.2%) speak English at home, 7 (1.8%) have another European language (German, French or Dutch) as home language. The Afrikaans-speaking children are in a ratio of roughly 6:5 (1.21:1) to the English-speaking pupils. The ratio of boys: girls is 7:5 (1.41:1). For the purpose of planning facilities for boys and girls in hostels and at school it would be easier to use the ratio of 3:2 in stead of 7:5.

6. Age, Sex and Cerebral Palsy Classification

Children could be classified as: spastic, athetoid, rigid, tremor, ataxia, brain-injury, mixed, cerebral palsy unclassified.

There are numerous classifications of types of cerebral palsy in use. For the purpose of this Survey broad classifications were considered sufficient. This first grouping was according to observable clinical signs. The "Brain-Injury" referred to in this Survey was according to Strauss and Lehtinen's⁽⁵⁾ definition, and with no motor involvement. The aphasias in childhood (no motor involvement) of whom a few were known to be in cerebral palsy schools, were grouped under the Brain-Injuries. Where a "Mixed Type" was indicated, there the appropriate clinical signs also had to be marked, e.g. spastic and ataxia. The category "Cerebral Palsy Unspecified" was intended for use in cases where the diagnosis of cerebral palsy could be made, but the type had not been determined. Fortunately the one case which was placed in this category could be eliminated since it proved to be a bona fide microcephaly.

Table 2 (a) provides data on age, sex and cerebral palsy classification. Since no children were diagnosed as Tremor, and none as C.P. Unclassified, these categories were dropped.

The children were grouped by one-year intervals of age, into the cerebral palsy classifications, and within each cerebral palsy classification into male (M) and female (F). The one-year intervals are indicated by age at the lower end of the interval. Thus, 1 means 1 year to 1 year and 11 months, etc.

From Table 2 (a) various statistics may be read. The largest group are the Spastics, totalling 235, with 131 boys and 104 girls. The next largest group are the Athetoids: 65 (48 boys, 17 girls). The other groups are all small, with the exception of the Mixed group, 44 in number (22 boys, 22 girls.) The groups Rigid, Ataxia, Brain-Injury, Mixed, are each too small to allow separate statistical treatment. Consequently they were grouped together to form a group labelled "Rest", and were tabulated in the last two columns on the right. This gave 43 boys, 37 girls, totalling 80 children.

In this way three fairly large groups for comparative study were formed: the Spastics, the Athetoids, and the "Rest".

Table 2 (b) summarises the percentages of children in the different cerebral palsy categories.

Table 2 (b): PERCENTAGES OF 380 CHILDREN IN THE DIFFERENT CEREBRAL PALSY CLASSIFICATIONS

Classification	M	F	M + F
Spastic	34.5	27.4	61.9
Athetoid	12.6	4.5	17.1
Rigid	0.26	0.26	0.5
Ataxia	2.1	2.4	4.5
Brain-Injury	3.1	1.3	4.4
Mixed	5.8	5.8	11.6
Total Percentage	58.36	41.66	100.0

It will be seen from Table 2 (b) that the spastics form 61·9% of the total group, the Athetoids 17·1%, Rigidities 0·5%, Ataxics 4·5%, Brain-Injuries 4·4%, "Mixed" 11·6%. The inclusion of the Brain-Injuries within the meaning of Strauss and Lehtinen's definition as a category of cerebral palsies is not generally found in the literature. In this country it is justified by the fact that some cerebral palsied children with motor involvement show the syndrome of brain-injury described by Strauss and Lehtinen. The teaching techniques required for brain-injured children without motor involvement are used in cerebral palsy schools. Since there is nowhere else where brain-injured children without motor involvement may receive education it is accepted practice at some cerebral palsy schools to admit them provided they are not too aggressive and do not endanger the safety of the other children. The few childhood aphasia which slip into cerebral palsy schools are tolerated, provided they do not disrupt the classes. If these 17 Brain-Injureds were to be discounted then the percentages of the different categories of cerebral palsied children would be as follows: Spastics 64·7%, Athetoids 17·9%, Rigidities 0·6%, Ataxics 4·7%, Mixed 12·1%.

Table 2 (c) sets out in detail the diagnoses of the group of cerebral palsied children marked "Mixed".

Table 2 (c): DETAILED ANALYSIS OF "MIXED" CLASSIFICATION

Age in Years	Spastic & Athetoid	Spastic Rigid	Spastic Ataxia	Spastic Brain-Injury	Spastic Tremor	Spastic Athetoid Tremor	Spastic Tremor Ataxia	Spastic Ataxia Brain-Injury	Athetoid Brain-Injury	Athetoid Ataxia	Ataxia Brain-Injury	Tremor Brain-Injury	Athetoid Rigid Ataxia	Total
2	1	—	—	—	—	—	—	—	—	—	—	—	—	1
3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	1	—	—	—	—	—	—	—	—	—	—	—	—	1
5	1	—	1	—	—	—	—	—	—	—	—	1	1	4
6	—	2	1	1	—	—	1	—	—	—	—	—	—	5
7	—	1	1	—	—	—	—	—	—	1	—	—	—	3
8	3	—	—	1	—	—	—	—	1	—	—	—	—	5
9	1	—	—	—	—	—	—	—	—	—	—	—	—	1
10	3	1	1	—	1	—	—	—	1	—	—	1	—	8
11	—	—	1	—	—	—	1	—	—	—	—	—	—	2
12	1	—	—	1	—	—	—	—	—	—	—	—	—	2
13	—	1	1	—	—	—	—	1	—	—	1	—	—	4
14	—	1	1	—	1	1	—	—	—	—	—	—	—	4
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—	—	—	—	—	—	1	1
19	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	—	2	—	—	—	—	—	—	—	—	—	—	—	2
21	1	—	—	—	—	—	—	—	—	—	—	—	—	1
TOTAL....	12	8	7	3	2	1	2	1	2	1	1	2	2	44

From Table 2 (c) may be seen that there are 8 combinations of spasticity with some other condition (36 children). The rest (8 children) were divided between 5 combinations of conditions.

In Table 2 (a) the data are also given of the percentage which each category of children forms of its own sex group (fifth line from the bottom of Table 2 (a)). Thus, Spastic boys form 59·0% of the total group of boys (34·5% of the total group of children). Spastic girls form 65·8% of the total group of girls (27·4% of total group of children).

The mean ages of the various categories of cerebral palsied children, together with the standard deviation from the mean (S.D.), and the median age are also to be found in the bottom three lines of Table 2 (a). (There were a few cases older than 21 years, but they were grouped together with the 21 year-olds).

The mean age of the total group of boys is 10·87 years and the mean age of the total group of girls is 10·61 years.

Table 2 (d) sets forth the mean ages of the boys and girls in each of the groups Spastic, Athetoid and "Rest". The differences in the mean ages between the boys and girls in each group are given, as well as the standard deviation of this difference, and the Critical Ratio. It is quite clear from the last line in this table that none of the critical ratios show a significant difference.

Table 2 (d): SIGNIFICANCE OF THE DIFFERENCES BETWEEN THE MEAN AGES OF THE BOYS AND GIRLS IN THE SPASTIC, ATHETOID AND "REST" CLASSIFICATION

	Spastic	Athetoid	Rest
Mean Age: Boys	11.27	9.98	9.13
Mean Age: Girls	10.78	9.62	10.58
Difference in Age49	.36	1.60
S.D. of difference61	1.03	.91
Critical Ratio80	.35	1.76

Since there are no significant differences in the mean ages of the boys and girls they may be grouped together in one distribution.

The difference between the mean ages of the boys in the Spastic and the Rest groups is 2·14. With 172 degrees of freedom, $t = 2·77$, then $P = .01$. The difference is accordingly significant. This, however, is the only significant difference between the mean ages of the boys in each category. The differences in mean ages between the various groups of girls are not significant.

CHAPTER 3

THE PHYSICAL DISABLEMENT

1. Table 2 (a) in the previous chapter presents data on the numbers of children in the various diagnostic categories of cerebral palsy arranged by ages.

The physical disabilities will be more closely analysed in this chapter.

The Questionnaire elicited data about (a) the diagnostic category of cerebral palsy, (b) the limbs involved, and (c) the severity with which the child as a physically functioning individual was disabled.

The relationship between these three sets of data will be sought.

Since much importance is attached to the doctor's diagnosis of whether the physical impairment is *mild*, *moderate* or *severe*, reference should be made to the Schedule of Instructions, page 96 (Appendix B), where these three degrees of impairment are defined. The definitions are quoted:

Mild: The patient needs no treatment as he has no speech problems, is able to care for his daily needs, and ambulates without the aid of any appliances.

Moderate: The patient needs special types of treatment since he is inadequate in self-care, ambulation and/or speech. Braces and self-help appliances are needed.

Severe: The patient needs treatment but the degree of involvement is so severe that the prognosis for self-care, ambulation and speech is very poor."

2. In Table 3 the 380 cerebral palsied children were grouped into three age groups:—

- (i) Less than 5 years 11 months, i.e. below 6 years age.
- (ii) Between 6 and 15 years 11 months, or 6-15 years.
- (iii) 16 Years age and above, or 16-21 years.

Table 3 consists of three parts: 3 (a), 3 (b), 3 (c). Table 3 (a) consists of a detailed presentation of data of the three age groups. They were classified according to Spastic, Athetoid and "Rest". These groups were subdivided into male and female, and the children of each sex were then placed into a distribution on the basis of the *Limbs Involved* (reading down the left: Monoplegia, Hemiplegia, etc.) and (reading across the top) according to the *severity of the child's disablement*: Mild, Moderate or Severe.

In Table 3 (b) the boys and girls have been grouped together, and in Table 3 (c) the totals are given within each category of Mild, Moderate or Severe.

The data in Table 3 are presented in this fashion to enable them to be seen comprehensively.

3. A few facts emerge:

- (1) There are 65 children below 6 years of age; there are 257 in the 6-15 year age group; and 58 are 16 years and older. The below sixes are of pre-school age (actually there are more in the pre-school group). The 6-16 year group are of compulsory school-going age. The 16-21 year old group, contain 19 children who were in their sixteenth year when the survey was made, but who, at date of writing this report, will have become 17 years old. Since they have passed compulsory schoolgoing age they were grouped together with the other potential school-leavers.

(2) The sexes had the following representation within each age group:—

<i>Age group</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Below 6 years	43	22	65
6-15 years	139	118	257
16-21 years	40	18	58
TOTAL	222	158	380

These data were set up as a contingency table to test the null hypothesis that there were no significant differences between the numbers of boys and girls in the different age groups. With $X^2 = 0.91$, degrees of freedom: 2, P was less than .70. The differences in number between boys and girls in the different age groups are therefore statistically not significant, and 70% due to chance factors.

(3) In the non-spastic groups 65 out of 145 children were *not* placed in the *Limbs Involved* categories of Monoplegia to Quadriplegia. There is therefore no point in comparing the limb involvements of the three groups of Spastics, Athetoids and the “Rest”.

(4) The data in Table 3 can therefore be condensed as in Table 4.

Table 4: SEVERITY OF DISABILITY: SUMMARY

Age Groups	Spastic			Athetoid			Rest			Total
	Mild	Mod.	Severe	Mild	Mod.	Severe	Mild	Mod.	Severe	Total
Below 6 years.....	13	13	5	5	5	7	6	4	7	65
6-15 years.....	61	61	34	9	17	18	13	24	20	257
16-21 years.....	20	20	8	0	3	1	1	2	3	58
TOTAL.....	94	94	47	14	25	25	20	30	30	380

(5) The null hypothesis was set in studying the differences in frequencies between the age groups in the categories of Mild, Moderate and Severe within the Spastic, Athetoid, and “Rest” groups.

(i) In the Spastic group, $X^2 = 1.756$, the degrees of freedom were 4, and P was less than 0.80. The differences are accidental and not statistically significant.

(ii) Because of the low cell values in the 16-21 year old group of Athetoids, only the differences between the Below 6 years and 6-15 year groups were studied. $X^2 = 0.64$, the degrees of freedom were 2, and P was less than 0.80, which meant that the differences were statistically not significant.

(iii) The cell values in the Below 6 years and 16-21 year groups in the “Rest” group were too low to compute X^2 .

- (6) The data were thereupon grouped into the Mild, Moderate and Severe categories without reference to cerebral palsy category:—

Age Groups	Mild	Moderate	Severe	Total
Below 6 years	24	22	19	65
6-15 years	83	102	72	257
16-21 years	21	25	12	58
TOTAL	128	149	103	380

Here $X^2 = 1.67$, the degrees of freedom were 4 and P was 0.80. This indicates that there is no significant change in the degree of severity of the disablement as the children grow older. Within certain limits of error one might say “once a mild (or moderate, or severe) cerebral palsy always a mild (moderate, or severe) cerebral palsy.”

- (7) The differences in the numbers of boys and girls diagnosed as having Mild, Moderate or Severe cerebral palsy were also studied:—

Sex	Mild	Moderate	Severe	Total
Boys	72	91	59	222
Girls	56	58	44	158
TOTAL	128	149	103	380

In this case $X^2 = 0.24$, the degrees of freedom were 2, and P was 0.90. Which indicates that both sexes tended to be as Mild, Moderate or Severe in the degree of their disabilities. The differences were not statistically significant, and were due to chance factors 90% of the time.

- (8) With reference to total figures, there are 128 mildly impaired cerebral palsy children, 149 are moderately impaired, and 103 are severely impaired. The ratio of mild: moderate: severe may be expressed as roughly 6: 7: 5.

4. Differences in intelligence

At this stage it would be interesting to learn whether these three groups of Mildly, Moderately, and Severely disabled cerebral palsy children show any differences in mean intelligence quotients, as obtained with the S.A. Individual Scale. The intelligence of the cerebral palsied children receives full discussion in Chapter 5. From Tables 19 and 20 it may be seen that the differences in mean I.Q. between these three groups of cerebral palsied children are statistically significant. The mean I.Q. of the Severe group is significantly lower than the mean I.Q. of the Moderate group, which is again significantly lower than the Mild group. This means that factors other than chance are operating to give the differences in mean intelligence of these three groups.

5. *The degree of involvement of specific functions*

(1) In Part II of the Questionnaire data was collected pertaining to disablement of the following specific physical functions: Vision, Hearing, Speech, Sitting Balance, Arm-Hand Use, Walking.

These were marked in accordance with a four-point scale: Minimal, Mild, Moderate, Severe. If the functions were handicapped to a degree that is Minimal or Mild, then the child was considered to have a disability of a *non-handicapping* nature. If, on the other hand, the functions were handicapped to a Moderate or Severe degree, then the child was considered to have a *handicapping* disability in the areas concerned.

It would, perhaps, be fruitful to study again Part II in the Questionnaire and in the Schedule of Instructions (Appendix A and B).

(2) The children were divided into two main groups on the basis of age:

- (i) Above 6 years age (Table 5).
- (ii) Below 6 years age (Table 6).

The children were so divided because it is admittedly difficult to arrive at an accurate evaluation of the functions of speech, hearing, vision, walking, when dealing with young children.

(3) In Tables 5 and 6 the cerebral palsied children are presented as three groups:

1. Mild.
2. Moderate.
3. Severe.

The precise meaning of these terms were defined in Chapter 3 (1).

Each of these groups was then subdivided into:

- (a) Spastic.
- (b) Athetoid.
- (c) "Rest".

Under the heading *Spastic* the incidences of children with Monoplegia, Hemiplegia (Right and Left combined), Triplegia (Right and Left combined), Paraplegia and Quadriplegia are given.

The numbers of children in these categories are then broken down according to the Minimal, Mild, Moderate or Severe degree of impairment in each of the functions of Vision, Hearing, Speech, the ability to maintain Sitting Balance, to Use Arms and Hands, and to Walk. They are presented for boys (M) and girls (F) separately.

The point should be made that it would be fruitless to attempt to reconcile statistically the data in Tables 5 and 6 with the incidence of children diagnosed as having cerebral palsy, Mild, Moderate, or Severe (Tables 3, 4). In the first place, the evaluation as reported in Tables 3 and 4 was in terms of the total picture of disablement which a child with a particular diagnosis of cerebral palsy presented. For instance, Table 5 (3) (a) has one child with hemiplegia. The diagnosis was: Spastic Hemiplegia, Severe. According to Table 5 this child was *minimally* handicapped in Vision, Hearing, Speech and Sitting Balance, *moderately* handicapped in walking, and *severely* handicapped in Arm-Hand Use. It would be difficult to decide whether this child was mildly, moderately or severely handicapped purely on the basis of the information given in Table 5. In arriving at a diagnosis of hemiplegia severe, one might also be influenced by the personality and intellectual ability of the child, factors not reflected in this Table. In the second place the incidence of *disabilities*, not children, were counted. There were some forms incomplete in respect of data on Part II, e.g. data on Vision, Hearing may have been omitted, but provided in the other areas.

Tables 5 and 6 are inserted in view of the possible research value of having complete statistics available. The form in which the data are presented does not allow of statistical treatment because of the low values of the scores in each individual cell.

The data were therefore summarised and presented in compact form in Table 7.

(4) Although the degree of disability in each of the six functions was rated on a four-point scale, there is little justification to compare the four degrees of variation statistically. For purposes of study and comparison sufficient value will be derived from dividing the disabilities into two groups: Non-handicapping and Handicapping. This was done in Table 7. Once again the children were divided into two age groups:—

- (i) 6-21 years.
- (ii) 1-5 years.

These groups were again subdivided into groups which were—

- (1) Mild.
- (2) Moderate.
- (3) Severe.

in total physical impairment. Data is given for each of the three groups: Spastic, Athetoid, and “Rest”, under the headings Vision, Hearing, Speech, etc.

The categories Minimal and Mild were fused to form a single group with *Non-Handicapping* disabilities; Moderate and Severe were fused to form a group with *Handicapping* disabilities. Differentiation between boys and girls also is disregarded.

(5) In Table 7 (a) the condensed frequencies are reported. In Table 7 (b) these frequencies are reported as percentages. The percentages were obtained by totalling the frequencies of one cell in the Non-Handicapping group with its corresponding cell in the Handicapping group and computing percentages. For instance, Table 7 (a): In the Mild group the total number of *spastics* about whom data on Vision are available is:— $79 + 2 = 81$. Therefore, $79 = 97.5\%$ of 81; and $2 = 2.5\%$ of 81 (See Table 7 (b)). Another example: In the subtotals for *Moderate* in Table 7 (a) it can be seen that there is data on $115 + 11 = 126$ children in respect of Vision. In Table 7 (b) these are reported as $115 = 91.3\%$ of 126, and $11 = 8.7\%$ of 126.

The reporting of the frequencies in terms of percentages facilitates comparisons. The school age group [Table 7 (a) (i)] will be considered.

(6) A superficial perusal of Table 7 (a) (i) shows that the greatest incidence of handicapping disabilities is in the Severe group with the Mild group showing the least number.

(7) To leave this at a superficial scrutiny of Tables 7 (a) and 7 (b) is not satisfactory. When a doctor examines a cerebral palsied child and diagnoses him as “mild”, “moderate”, or “severe”, he reports and summarises as it were the impressions that he has gained by examining the child’s limb involvement, body posture and control, his vision, speech, hearing, etc.

One often wonders how valid these diagnoses are, that is, in how far the blanket term “mild”, or “moderate”, or “severe” is a true description of the total effect which disabilities in the various areas of physical functioning has on the individual child.

In studying Tables 7 (a) and (b) one has the impression that the incidences of children showing *non-handicapping* involvements in the six areas of function decrease as one moves from *Mild* to *Moderate* to *Severe*. Another way of stating this is to say that the number of children showing *handicapping* involvements of these functions increases as one moves from *Mild* to *Moderate* to *Severe*.

Table 7 (a): DISABLEMENT OF SPECIFIC FUNCTIONS IN:

(i) CEREBRAL PALSID CHILDREN: 6-21 YEARS AGE

	Non-Handicapping						Handicapping					
	Vision	Hearing	Speech	Sitting Balance	Arm-Hand Use	Walking	Vision	Hearing	Speech	Sitting Balance	Arm-Hand Use	Walking
(1) <i>Mild</i>												
Spastic.....	79	81	75	81	77	80	2	—	6	—	4	1
Athetoid.....	9	9	9	9	9	9	—	—	—	—	—	—
Rest.....	13	13	8	14	13	14	1	1	6	—	1	—
Sub-total.....	101	103	92	104	99	103	3	1	12	—	5	1
TOTAL for:	Non-Handicapping: 602 (96.5%)						Handicapping: 22 (3.5%)					
(2) <i>Moderate</i>												
Spastic.....	72	80	68	80	50	67	8	—	11	—	29	13
Athetoid.....	20	17	14	20	13	16	—	3	6	—	1	4
Rest.....	23	26	16	25	15	21	3	—	10	1	11	5
Sub-total.....	115	123	98	125	78	104	11	3	27	1	41	22
TOTAL for:	Non-Handicapping: 643 (86.0%)						Handicapping: 105 (14.0%)					
(3) <i>Severe</i>												
Spastic.....	35	39	29	25	23	8	5	1	12	16	18	33
Athetoid.....	18	17	7	7	2	4	1	1	12	11	16	15
Rest.....	17	21	12	12	14	6	6	2	10	11	9	17
Sub-total.....	70	77	48	44	39	18	12	4	34	38	43	65
TOTAL.....	286	303	238	273	216	225	26	8	73	39	89	88
TOTAL for:	Non-Handicapping: 296 (60.2%)						Handicapping: 196 (39.8%)					

(ii) CEREBRAL PALSID CHILDREN: BELOW 6 YEARS AGE

(1) Mild.....	24	21	16	23	22	22	—	—	7	1	2	2
(2) Moderate.....	20	20	13	20	11	13	2	1	9	2	11	9
(3) Severe.....	15	14	—	10	2	3	—	—	19	9	16	16
TOTAL.....	59	55	29	53	35	38	2	1	35	12	29	27

Table 7 (b): DISABLEMENT OF SPECIFIC FUNCTIONS EXPRESSED AS PERCENTAGES OF TOTAL INCIDENCE
IN EACH FUNCTION:

(i) CEREBRAL PALSIED CHILDREN: 6-21 YEARS AGE

	Non-Handicapping						Handicapping					
	Vision	Hearing	Speech	Sitting Balance	Arm-Hand Use	Walking	Vision	Hearing	Speech	Sitting Balance	Arm-Hand Use	Walking
(1) <i>Mild</i>												
Spastic.....	97.5	100.0	92.6	100.0	95.1	98.8	2.5	0	7.4	0	4.9	1.2
Athetoid.....	100.0	100.0	100.0	100.0	100.0	100.0	—	—	—	—	—	—
Rest.....	92.9	92.9	57.1	100.0	92.9	100.0	7.1	7.1	42.9	—	7.2	—
Sub-total.....	97.1	99.0	88.5	100.0	95.2	99.0	2.9	1.0	11.5	—	4.8	1.0
(2) <i>Moderate</i>												
Spastic.....	90.0	100.0	86.1	100.0	63.3	83.8	10.0	—	13.9	—	36.7	16.2
Athetoid.....	100.0	85.0	70.0	100.0	92.9	80.0	—	15.0	30.0	—	7.1	20.0
Rest.....	88.5	100.0	61.5	96.1	57.7	80.8	11.5	—	38.5	3.9	42.3	19.2
Sub-total.....	91.3	97.6	78.4	99.2	65.6	82.5	8.7	2.4	21.6	0.8	34.4	17.5
(3) <i>Severe</i>												
Spastic.....	87.5	97.5	70.7	61.0	56.1	19.5	12.5	2.5	29.3	39.0	43.9	80.5
Athetoid.....	94.7	94.4	36.8	38.9	11.1	21.1	5.3	5.6	63.2	61.1	88.9	78.9
Rest.....	73.9	91.3	54.5	52.2	60.9	26.1	26.1	8.7	45.5	47.8	39.1	73.9
Sub-total.....	85.4	95.1	58.5	53.7	47.6	21.7	14.6	4.9	41.5	46.3	52.4	78.3
TOTAL.....	91.7	97.4	76.5	87.5	70.8	71.9	8.3	2.6	23.5	12.5	29.2	28.1

(ii) CEREBRAL PALSIED CHILDREN: BELOW 6 YEARS AGE

(1) Mild.....	100.0	100.0	69.6	95.8	91.7	91.7	—	—	30.4	4.2	8.3	8.3
(2) Moderate.....	90.9	95.2	59.1	90.9	50.0	59.1	9.1	4.8	40.9	9.1	50.0	40.9
(3) Severe.....	100.0	100.0	—	52.6	11.1	15.8	—	—	100.0	47.4	88.9	84.2
TOTAL.....	96.7	98.2	45.3	81.5	54.7	58.5	3.3	1.8	54.7	18.5	45.3	41.5

(8) This impression was submitted to statistical analysis by totalling the number of times that *Non-Handicapping* (or *Handicapping*) disabilities were reported in the groups *Mild*, *Moderate* and *Severe*. The following trend became evident:—

<i>Disability group</i>	<i>Non-Handicapping</i>	<i>Handicapping</i>
(1) Mild	602 (96·5%)	22 (3·5%)
(2) Moderate	643 (86·0%)	105 (14·0%)
(3) Severe	296 (60·2%)	196 (39·8%)

(9) One wonders whether the differences in total incidences between the groups *Mild*, *Moderate*, *Severe* within each of the categories *Non-Handicapping* and *Handicapping* has any significance. The critical ratio of the differences between the percentages of these groups is given below:—

<i>Groups Compared</i>	<i>Difference in %</i>	<i>S.D. D%</i>	<i>C.R.</i>	<i>P.</i>
Mild and Moderate	10·5%	1·56%	6·73	·01
Mild and Severe	36·3%	2·38%	15·2	·01
Moderate and Severe	25·8%	2·46%	10·8	·01

These differences between the percentages of the three groups in the categories *Non-Handicapping* and *Handicapping* are statistically significant at the ·01 level of confidence. This means that the differences are caused by factors other than accidental. The premise that the more handicapped a group of children is, the greater are the number of disabilities in the various areas of function has found proof in this analysis.

(10) In view of the low numerical values in the cells in the *Athetoid* and “*Rest*” groups in Table 7 (a) one does not feel justified in computing the statistical significance of the differences in the percentages between comparable cell units. In some areas the difference in percentage of handicapping disabilities for the various cerebral palsy groups is so big that it is quite apparent that the difference is statistically significant. For instance, in the *Mild* group, on the right hand side where the disabilities are of a handicapping nature, there is a large difference in the percentage of *Spastics* with a speech handicap and the “*Rest*” with a speech handicap. The difference is 42·9%– 7·4%, but only 12 cases are involved. This is significant at the 1 per cent level of confidence. Another example: in the *Mild* group there are no *Spastics* with a hearing handicap. There is 1 in the “*Rest*” group with a hearing handicap. The difference in percentages is = 7·1%. This is statistically significant at the 2 per cent level of confidence. But one doubts that it is of much use knowing this in view of the small numbers involved.

(11) The data are presented in percentage form in Table 7 (b) for the research value it may have when additional numbers of children have been examined within the same frame of reference.

For the present the amount of work involved in computing the significance of the difference in the percentages between the various groups of *Spastic*, *Athetoid* and “*Rest*” cerebral palsy children does not seem justified.

CHAPTER 4

PERSONALITY TRAITS

1. As stated in Chapter 1, paragraph 5 (4) an attempt was made to glean information about some personality traits of cerebral palsied children.

The four traits studied were *persistence*, *disposition*, *sociability*, and *concentration*. The problems encountered in rating personality traits are well-known. They need no enumeration. To avoid the effects of the tendency to cluster the ratings around the mean or average or neutral category of the scale, it was decided to set up four-point scales. The first two degrees of each trait as defined on the rating scale were considered to reflect the *positive* aspects of each trait, and the last two degrees to reflect the *negative* aspects of each trait.

In studying the data the ratings on the first half of the scale were totalled, and the ratings on the second half were totalled. This gave two scores on each trait, one reflecting the incidence of cerebral palsied children who displayed the positive qualities and the other reflecting the incidence of cerebral palsied children who displayed the negative qualities of the trait. These are called *positive* and *negative scores*.

2. These data are set up in Table 8 for the children who are 6 years of age and older, and Table 9 for children below 6 years age.

Once again the children were separated into three groups:

- Mild.
- Moderate.
- Severe.

Each group was then subdivided into *Spastic*, *Athetoid*, and "Rest".

The number of each group obtaining positive scores on the personality traits were entered in the appropriate columns under *Non-Handicapping*. Negative scores were entered under *Handicapping*.

3. Testing for sex differences in personality traits by means of the X^2 test

In order to determine whether the ratings show differences between sex groups, the positive and negative scores on each trait were totalled separately for boys and girls and X^2 was tested by means of four-fold tables. Results are tabled in Table 10. It is clear that none of the differences between boys' and girls' scores are statistically significant, so that the scores for boys and girls may be totalled.

Table 10. X^2 TEST FOR SEX DIFFERENCES IN PERSONALITY TRAIT RATINGS

Groups	Persistence		Disposition		Sociability		Concentration	
	+	-	+	-	+	-	+	-
Boys.....	58	113	96	75	113	58	75	95
Girls.....	48	87	69	60	83	46	56	74
X^2	0.89		0.21		.098		0.032	
d.f.....	1		1		1		1	
P.....	0.36		Between .70 and .50		0.80		.80 to .90	

Table 8: PERSONALITY TRAITS: CEREBRAL PALSIED CHILDREN 6-21 YEARS

	Non-Handicapping								Handicapping							
	Persistence		Disposition		Sociability		Concentration		Persistence		Disposition		Sociability		Concentration	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. <i>Mild</i>																
Spastic.....	11	13	22	20	29	24	19	17	32	24	21	17	13	13	22	20
Athetoid.....	1	1	1	3	3	2	3	2	4	3	4	1	2	2	2	2
Rest.....	3	—	4	2	2	1	3	1	5	6	4	3	6	5	5	5
Sub-total....	15	14	27	25	34	27	25	20	41	33	29	21	21	20	29	27
Sub-total M+ F	29		52		61		45		74		50		41		56	
2. <i>Moderate</i>																
Spastic.....	18	15	27	20	30	22	19	19	26	16	16	11	14	9	25	12
Athetoid.....	4	2	12	1	13	2	6	1	11	1	3	2	2	1	9	2
Rest.....	3	5	6	5	10	7	3	7	11	7	8	7	4	5	11	5
Sub-total....	25	22	45	26	53	31	28	27	48	24	27	20	20	15	45	19
Sub-total M+ F	47		71		84		55		72		47		35		64	
3. <i>Severe</i>																
Spastic.....	10	8	15	9	17	15	11	5	13	14	8	8	6	2	12	12
Athetoid.....	4	2	3	1	4	3	5	2	6	4	8	5	7	3	6	4
Rest.....	4	2	6	8	5	7	6	2	5	12	3	6	4	6	3	12
Sub-total....	18	12	24	18	26	25	22	9	24	30	19	19	17	11	21	28
Sub-total M+ F	30		42		51		31		54		38		28		49	
TOTAL.....	58	48	96	69	113	83	75	56	113	87	75	60	58	46	95	74
TOTAL M+ F	106		165		196		131		200		135		104		169	

Table 9: PERSONALITY TRAITS: CEREBRAL PALSIED CHILDREN YOUNGER THAN 6 YEARS AGE

	Non-Handicapping								Handicapping							
	Persistence		Disposition		Sociability		Concentration		Persistence		Disposition		Sociability		Concentration	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
<i>(a) Mild</i>																
Spastic.....	—	5	2	7	2	6	—	5	5	3	3	1	3	2	5	3
Athetoid.....	—	—	3	—	3	—	2	—	5	—	2	—	2	—	3	—
Rest.....	1	—	3	—	2	—	2	—	5	—	3	—	4	—	4	—
Sub-total....	1	5	8	7	7	6	4	5	15	3	8	1	9	2	12	3
Sub-total M+F.....	6		15		13		9		18		9		11		15	
<i>(b) Moderate</i>																
Spastic.....	—	—	5	1	5	1	1	—	9	4	4	3	4	3	8	4
Athetoid.....	2	—	2	1	2	1	1	2	1	2	1	1	1	1	1	—
Rest.....	1	—	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Sub-total....	3	—	8	3	8	3	3	3	11	8	6	5	6	5	10	5
Sub total M+F.....	3		11		11		6		19		11		11		15	
<i>(c) Severe</i>																
Spastic.....	—	—	—	1	1	2	1	—	3	2	3	1	2	—	2	2
Athetoid.....	1	—	2	—	1	—	1	—	4	1	3	1	4	1	4	1
Rest.....	—	—	1	—	1	—	2	—	4	2	3	2	3	2	2	2
Sub-total....	1	—	3	1	3	2	4	—	11	5	9	4	9	3	8	5
Sub-total M+F.....	1		4		5		4		16		13		12		13	
TOTAL.....	5	5	19	11	18	11	11	8	37	16	23	10	24	10	30	13
TOTAL M+F	10		30		29		19		53		33		34		43	

4. One notices however that in *Persistence* and *Concentration* both boys and girls obtain higher negative than positive scores; whilst in *Disposition* and *Sociability* higher positive than negative scores are obtained. These differences between positive and negative scores are tested in four-fold tables by means of X^2 and the null hypothesis.

Table 11 (a): X^2 TEST OF DIFFERENCES BETWEEN POSITIVE AND NEGATIVE SCORES ON TRAITS OF BOYS AND GIRLS TOGETHER, 6-21 YEARS OLD

	Persistence		Disposition		Sociability		Concentration	
	+	-	+	-	+	-	+	-
Boys and Girls.....	106	200	165	135	196	104	131	169
fe.....	153	153	150	150	150	150	150	150
X^2	28.88		3.0		28.22		4.82	
d.f.....	1		1		1		1	
P.....	<0.001		0.08		0.001		0.03	

From Table 11 it may be seen that the differences between the positive and the negative scores on both *Persistence* and *Sociability* are significant at the 0.001 level of confidence. On *Disposition* the difference is significant at the 8% level and cannot be accepted. On *Concentration* the difference is significant at the 3% level, and can also not be accepted. Nevertheless the high negative score agrees with one's experience that cerebral palsied children have difficulty concentrating.

The differences between positive and negative scores obtained by the boys as a separate group, and by the girls as a separate group were also tested with X^2 and the null hypothesis. See Table 11 (b) and 11 (c).

Table 11 (b): X^2 TEST OF DIFFERENCES BETWEEN POSITIVE AND NEGATIVE TRAITS OF BOYS, 6-21 YEARS OLD

	Persistence		Disposition		Sociability		Concentration	
	+	-	+	-	+	-	+	-
Boys.....	58	113	96	75	196	104	75	95
fe.....	85.5	85.5	85.5	85.5	150	150	85	85
X^2	17.68		2.58		28.22		2.36	
d.f.....	1		1		1		1	
P.....	<0.001		<0.20		<0.001		<0.20	

Table 11 (c): X^2 TEST OF DIFFERENCES BETWEEN POSITIVE AND NEGATIVE TRAITS OF GIRLS, 6-21 YEARS OLD

	Persistence		Disposition		Sociability		Concentration	
	+	-	+	-	+	-	+	-
Girls.....	48	87	69	60	83	46	56	74
fe.....	67.5	67.5	64.5	64.5	64.5	64.5	65	65
X^2	11.26		0.62		10.62		2.50	
d.f.....	1		1		1		1	
P.....	<0.001		<0.50		.001		<0.20	

From Table 11 (b) and 11 (c) it is clear that the differences between positive and negative scores on *Persistence* and *Sociability* are significant at the .001 level of confidence in the boys' as well as the girls' groups. One may therefore be sure that the significance of the differences between positive and negative scores found in Table 11 (a) on these two traits are due to factors operating in the boys as well as the girls.

Taken as a group then, it would seem that by rating cerebral palsied children on the traits of *Persistence* and *Sociability*, as was done in the Questionnaire, they can be separated into two groups, one group, showing positive and the other negative qualities of the two traits. Furthermore it appears that there are appreciably more cerebral palsied children *lacking* in the positive attributes of Persistence than there are cerebral palsied children having the positive attributes.

It is also clear that in this group of cerebral palsied children there are significantly more who are positively sociable than there are children lacking in the positive attributes of sociability.

5. In Table 12 the results of the X² test for the significance of the differences between positive and negative scores on these personality traits for the group aged 1 year to 5 years 11 months are tabulated. The null hypothesis was set.

Table 12: DIFFERENCES BETWEEN POSITIVE AND NEGATIVE SCORES ON PERSONALITY TRAITS FOR CHILDREN BELOW 6 YEARS AGE

	Persistence		Disposition		Sociability		Concentration	
	+	-	+	-	+	-	+	-
Boys and Girls.....	10	53	30	33	29	34	19	43
fe.....	31.5	31.5	31.5	31.5	31.5	31.5	31	31
X ²	29.36		.06		.026		8.54	
d.f.....	1		1		1		1	
P.....	.001		.80		< .90		< .001	

On Persistence and Concentration the significance is beyond doubt. The differences on Disposition and Sociability are not significant. It is interesting to note that even at this early age Persistence and Concentration give significant differences.

6. The question arises whether significant differences are found in the scores obtained by Spastics, Athetoids and "Rest" on these traits.

Table 13 contains the results of the X² tests of the significance of the differences between positive and negative scores obtained on these traits by the groups of Spastics, Athetoids and "Rest", postulating the null hypothesis.

From Table 13 (a) it is clear that the differences between Spastics and Athetoids are not significant at the 1% level of confidence. If X² for these four traits are summed then X² = 7.50, and with 4 degrees of freedom P = < 0.10.

From Table 13 (b) it is seen that the Spastics are significantly more sociable than the children who make up the group called "Rest". The differences obtained on the other traits are not significant. When X² for these four traits are summed the differences become significant with 4 degrees of freedom at the 1 per cent level of confidence. However this is due to the high X² value of Sociability. When that is omitted then sum of X² for the other three traits is 5.86, and with 3 degrees of freedom, P is less than 0.20.

Table 13: X^2 TEST FOR THE SIGNIFICANCE OF DIFFERENCES BETWEEN SPASTIC AND ATHETOID; SPASTIC AND REST; ATHETOID AND REST: IN THE GROUP 6-21 YEARS

(a)

	Persistence		Total	Disposition		Total	Sociability		Total	Concentration		Total
	+	-		+	-		+	-		+	-	
Spastic.....	75	125	200	113	194	307	137	57	194	90	103	193
Athetoid.....	14	29	43	21	23	43	27	23	50	19	25	44
TOTAL.....	89	154	243	134	217	350	164	80	244	109	128	237
$X^2 =$	3.72			1.98			4.98			0.17		
d.f. =	1			1			1			1		
P =	< .05			0.16			0.03			0.70		

(b)

	Persistence		Total	Disposition		Total	Sociability		Total	Concentration		Total
	+	-		+	-		+	-		+	-	
Spastic.....	75	125	200	113	194	307	137	57	194	90	103	193
Rest.....	17	46	63	13	31	44	32	30	62	22	41	63
TOTAL.....	92	171	263	126	225	351	169	87	256	112	144	256
$X^2 =$	2.33			0.88			7.56			2.65		
d.f. =	1			1			1			1		
P =	0.13			0.36			> .001			< 0.10		

(c)

	Persistence		Total	Disposition		Total	Sociability		Total	Concentration		Total
	+	-		+	-		+	-		+	-	
Athetoid.....	14	29	43	21	23	44	27	23	50	19	25	44
Rest.....	17	46	63	13	31	44	32	30	62	22	41	63
TOTAL.....	31	75	106	34	54	88	59	53	112	41	66	107
$X^2 =$	0.38			3.07			0.06			0.75		
d.f. =	1			1			1			1		
P =	0.55			0.07			0.80			0.40		

From Table 13 (c) it is clear that none of the differences between Athetoids and "Rest" attain any significance. In Table 13 (c) the sum of $X^2 = 4.26$, degrees of freedom are 4, and P is less than 0.50.

7. A further question arises as to the significance of the differences which exist between the scores obtained on each of the personality traits by the total groups diagnosed as *Mild*, *Moderate* or *Severe*.

Table 14 sets out the data.

Table 14: THE SIGNIFICANCE OF THE DIFFERENCES IN SCORES OBTAINED ON THE PERSONALITY TRAITS BY THE MILD, MODERATE AND SEVERE GROUPS (6-21 YEARS)

(a) RAW SCORES

Groups	Non-Handicapping				Handicapping				Totals			
	Per.	Disp.	Soc.	Con.	Per.	Disp.	Soc.	Con.	Per.	Disp.	Soc.	Con.
Mild.....	29	52	61	45	74	50	41	56	103	102	102	101
Moderate.....	47	71	84	55	72	47	35	64	119	118	119	119
Severe.....	30	42	51	31	54	38	28	49	84	80	79	80
TOTAL.....	106	165	196	131	200	135	104	169	306	300	300	300

(b) SCORES EXPRESSED AS PERCENTAGES

Groups	Non-Handicapping				Handicapping			
	Per.	Disp.	Soc.	Con.	Per.	Disp.	Soc.	Con.
Mild.....	28.2	51.0	59.8	44.6	71.8	49	40.2	55.4
Moderate.....	39.5	60.2	70.6	46.2	60.5	39.8	29.4	53.8
Severe.....	35.7	52.5	64.6	38.8	64.3	47.5	35.4	61.2
TOTAL.....	34.6	55.0	65.3	43.7	65.4	45.0	34.7	56.3

(c) SIGNIFICANCE OF THE DIFFERENCES IN PERCENTAGES

Personality Traits	Groups Compared	Difference in Percentage	S.D. of D. %	C.R.
Persistence.....	Mild and Severe.....	7.5%	6.83	1.10
	Mild and Moderate.....	11.3%	6.39	1.77
	Moderate and Severe.....	3.8%	6.91	0.55
Disposition.....	Mild and Severe.....	1.5%	7.46	0.20
	Mild and Moderate.....	9.2%	6.72	1.37
	Moderate and Severe.....	7.7%	7.17	1.07
Sociability.....	Mild and Severe.....	4.8%	7.28	0.66
	Mild and Moderate.....	10.8%	6.41	1.69
	Moderate and Severe.....	6.0%	6.76	0.89
Concentration.....	Mild and Severe.....	5.8%	7.39	0.78
	Mild and Moderate.....	1.6%	6.74	0.24
	Moderate and Severe.....	7.4%	7.16	1.03

In Table 14 (a) the raw scores are given. In Table 14 (b) these raw scores have been converted to percentages. From Table 14 (a) can be ascertained that the scores obtained by the *Mild* group on *Persistence* (Per) total 103 (29 + 74). In Table 14 (b) the figures 28·2, and 71·8 entered in the cells opposite *Mild* and under the two columns under *Persistence* express the percentages which the scores 29 and 74 respectively form of the total score, 103. The other percentages were obtained in a similar manner.

In Table 14 (c) the significance of the differences between the percentages of the various groups are given. In the first column the traits upon which the groups are compared, are stated. In the second column are the groups being compared. Then follow the differences between the percentages. For instance in the Mild group 71·8% of the cerebral palsy children displayed the *Handicapping* or negative qualities of *Persistence*, and 64·3% in the *Severe* group. The difference is 7·5%. In the next column the Standard Deviations (S.D.) of the Difference in the Percentages are given. Then follow the Critical Ratios (obtained by dividing the difference by the Standard Deviation of the Difference). The 5% level of significance is attained by a C.R. = 1·96. None of these differences are therefore significant.

8. (1) In summary it may be stated that there are no significant differences between this group of cerebral palsy boys and girls when they are compared on these personality traits.

(2) There are no significant differences when the Spastics and Athetoids are compared on these personality traits. Nor are there significant differences between the Athetoids and the "Rest". There is a significant difference in the degree in which Sociability is shown by the Spastics as compared to the "Rest". More Spastics than "Rest" have a positive degree of Sociability. The differences between Spastics and "Rest" on the other traits are not significant.

(3) The cerebral palsied children in this group are lacking to an appreciable degree in the positive qualities of Persistence as rated in the Questionnaire. This is true of boys and girls, and it is true whether the children are younger or older than 6 years of age.

This group of cerebral palsied children shows the positive qualities of Sociability as rated in the questionnaire to a very significant degree. This is true of boys and girls, and true of the school-age children older than 6 years, but not true of the younger age group.

CHAPTER 5

THE INTELLIGENCE OF CEREBRAL PALSIED CHILDREN

1. The following explanations and instructions applied to the completion of this part of the Questionnaire:—

“It is very difficult for a psychologist to obtain an intelligence rating of a severely impaired cerebral palsied child. Very often in such cases the psychologist is reluctant to commit himself to an I.Q. figure, and at the most he might be prepared to place the child in some rough grouping of intelligence levels. Where adequate I.Q. ratings have been made by a *competent psychologist*, experienced in the mental assessment of cerebral palsied children, please fill in Part IV (A). If more than one rating has been made, please take that rating giving the most favourable assessment of the child’s intellectual ability. Sometimes a rating is obtained which does not agree with the level at which a pupil is functioning in the classroom. Under “Comments” there is an opportunity to indicate whether the School considers that the assessment is a fair one, or whether the child seems to be functioning *below* or *above* the assessed level. Place an “X” in the appropriate block”.

If the psychologist was not prepared to commit himself in respect of a specific I.Q. figure he was asked to mark a separate 9-point scale. (Part IV (B)).

There was a very distinct request that only competent psychologists should be allowed to complete this part of the Questionnaire on intelligence.

When the completed Questionnaires were analysed it was found that I.Q.’s on the Individual Scale of the National Bureau of Educational Research⁽¹⁾, which is standardised in South Africa, were by far the most numerous. There were also I.Q.’s derived from the old South African Group Test of Intelligence (8 pupils) and the New South African Group Test (7 pupils).

There were also a number of pupils who had been tested with intelligence tests standardised overseas, but not in South Africa.

It was decided to group together all the I.Q.’s derived from the South African Individual Scale. This gave 189 ratings. The I.Q.’s derived from overseas tests were quite numerous, but since they could not be treated together with I.Q.’s on the South African Individual Scale, the scores were transferred to Part IV (B) of the Form.

2. Table 15 and Table 16 contain the I.Q.’s derived from the South African Individual Scale.

Table 15 merely shows the distribution of I.Q.’s of the boys and girls separately according to their clinical categories.

Since the differences in mean I.Q.’s of these difference clinical and sex groups showed no statistical significance (the data were computed, but is not shown here), and moreover since all, excepting the spastic groups, contain very few cases, the data were rearranged in Table 16.

Table 15: DISTRIBUTION OF I.Q.'s ACCORDING TO SOUTH AFRICAN INDIVIDUAL SCALE

	Spastic		Athetoid		Rigid		Ataxia		Brain Injured		Mixed		Total		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M+F
25-29	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1
30	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
35	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1
40	1	3	—	—	—	—	—	—	—	—	—	1	1	4	5
45	2	2	1	—	—	—	—	—	—	—	—	—	3	2	5
50	—	3	—	—	—	—	—	1	1	—	—	2	1	6	7
55	4	1	—	1	—	—	—	—	—	—	1	2	5	4	9
60	6	3	4	2	—	—	1	—	1	—	—	—	12	5	17
65	1	5	1	—	1	—	2	1	—	1	—	—	7	7	14
70	7	5	2	—	—	—	—	2	—	1	1	—	10	8	18
75	10	8	2	2	—	—	—	—	—	—	2	—	14	10	24
80	5	2	1	2	—	—	—	1	—	1	—	—	9	4	13
85	6	5	2	—	—	—	—	2	—	—	—	1	11	6	17
90	5	6	—	—	—	—	—	1	—	—	—	1	6	8	14
95	6	6	1	—	—	—	—	—	—	—	—	1	8	7	15
100	5	3	1	—	—	—	—	—	—	—	—	1	5	4	9
105	3	2	1	—	—	—	—	—	—	—	—	—	4	2	6
110	3	—	—	—	—	—	—	—	—	—	—	1	4	1	5
115	—	2	—	—	—	—	—	1	—	—	—	—	1	2	3
120	2	1	—	—	—	—	—	—	—	—	—	—	2	1	3
125	1	1	—	—	—	—	—	—	—	—	—	—	1	1	2
130	—	1	—	—	—	—	—	—	—	—	—	—	—	1	1
TOTAL	69	59	16	7	1	—	7	5	3	2	10	11	106	83	189

Table 16: I.Q.'s ACCORDING TO THE S.A. INDIVIDUAL SCALE

I.Q.'s	Spastics		Rest		Total		Total
	M	F	M	F	M	F	M + F
25- 29.....	1	—	—	—	1	—	1
30- 34.....	—	—	—	—	—	—	—
35- 39.....	1	—	—	—	1	—	1
40- 44.....	1	3	—	1	1	4	5
45- 49.....	2	2	1	—	3	2	5
50- 54.....	—	3	1	3	1	6	7
55- 59.....	4	1	1	3	5	4	9
60- 64.....	6	3	6	2	12	5	17
65- 69.....	1	5	6	2	7	7	14
70- 74.....	7	5	3	3	10	8	18
75- 79.....	10	8	4	2	14	10	24
80- 84.....	5	2	4	2	9	4	13
85- 89.....	6	5	5	1	11	6	17
90- 94.....	5	6	1	2	6	8	14
95- 99.....	6	6	2	1	8	7	15
100-104.....	5	3	—	1	5	4	9
105-109.....	3	2	1	—	4	2	6
110-114.....	3	—	1	1	4	1	5
115-119.....	—	2	1	—	1	2	3
120-124.....	2	1	—	—	2	1	3
125-129.....	1	1	—	—	1	1	2
130-134.....	—	1	—	—	—	1	1
TOTAL.....	69	59	37	24	106	83	189
Median.....	81.5	79.68	75.6	71.65	79.3	77.75	78.65
Mean.....	81.93	81.32	76.73	72.70	80.11	78.81	79.54
SD.....	20.49	21.26	15.85	17.55	19.16	20.65	19.84
S _{DM}	2.47	2.78	2.66	3.58	1.86	2.26	1.44

In Table 16 the I.Q.'s of Spastics are shown in separate distributions from those of the Athetoids, Rigidities, Ataxics, Brain-Injureds and Mixed, which are grouped together under the heading "Rest". Distributions for boys and girls are shown separately and then a distribution for the total group is given.

The mean I.Q. of the boys in the Spastic group is 81·93; the mean I.Q. of the boys in the "Rest" group is 76·73. There is a difference of 5·20 in favour of the Spastics. This difference is not statistically significant. Similarly the difference in mean I.Q. of 8·62 which is in favour of the Spastic girls (mean I.Q. 81·32) and the "Rest" of the girls (mean I.Q. 72·7) is not statistically significant. The mean I.Q. of all the boys (80·11) is 1·30 higher than the mean I.Q. of all the girls (78·81). This difference is not statistically significant. This means that the differences in mean I.Q. between the various clinical and sex groups of cerebral palsied children are due to accidental causes and that in fact one has no reason to suspect valid differences in intellectual ability between these various groups.

These data are set forth in Table 17.

Table 17: DIFFERENCES BETWEEN MEAN I.Q.'S OF DIFFERENT GROUPS

Groups Compared	Difference between Means (D)	S.D. of D.	C.R.	P
Boys: Spastic and "Rest".....	5·20	3·63	1·43	0·10
Girls: Spastic and "Rest".....	8·62	4·5	1·90	0·10
Boys and Girls.....	1·30	2·93	0·44	0·10

The goodness of fit of a normal theoretical curve to this frequency distribution of I.Q.'s, was tested by means of X^2 . (Q. McNemar: Psychological Statistics, pp. 236-240⁽⁴⁾. $X^2 = 11·35$, with 19 degrees of freedom, $P = 0·95$. The difference between this distribution and the theoretical curve is not significant.

From the data in the last column in Table 16 the following is apparent:—

- (a) The Median is 78·65.
- (b) The Mean is 79·54.
- (c) The Standard deviation is 19·84.

3. In Table 18 the number and percentage of pupils in Table 16 falling in certain I.Q. groupings are presented, together with the corresponding numbers of pupils from the total group of 380, who could be expected to fall into these I.Q. groups.

Table 18: PUPILS FALLING WITHIN SPECIFIC I.Q. GROUPS

Classification	I.Q.	N. out of 189	%	N. out of 380
Imbeciles.....	25- 49	12	6·3	24
Morons.....	50- 69	47	24·9	95
Sub-Normal.....	70- 79	42	22·2	84
Dull-Normal.....	{ 80- 84	13	6·9	26
	{ 85- 89	17	9·0	34
Average.....	90-109	44	23·3	89
Above Average.....	110-134	14	7·4	28
TOTAL.		189	100·0	380

In the normal school population the borderline between subnormal and dull-normal is generally speaking placed at about I.Q. 79-80. Children below this I.Q. level are usually seen as candidates for the special classes.

The mean I.Q. of this group of cerebral palsied children falls at 79.54. If this were a group of normal children the mean I.Q. would have fallen at 100.

From Table 18 it may be seen that 203 (53.4%) out of 380 pupils fall below I.Q. 80, and 229 (60.3%) fall below I.Q. 85. Even if they had not had any physical disability they would on account of below normal intelligence alone have to be considered candidates for teaching techniques geared to the needs of the slow learning child.

For practical purposes "average intelligence" on the Individual Scale is thought of as falling between I.Q.'s 90-110. In the cerebral palsied group there are 89 children with I.Q.'s in this range, and there are 28 children with above average intelligence.

From the available data it is clear that the cerebral palsied children form a group much retarded in intellectual ability.

It should be clearly stated that the data refer only to the children who were at school at the time of the survey. There is reason to believe that there are other children not attending school who are mentally and physically very badly impaired. On the other hand there are children having cerebral palsy to such a slight degree of physical and mental impairment that they are able to attend ordinary provincial schools and have therefore not been reached in this survey.

4. In Table 19 a comparison is made between the mean I.Q.'s of cerebral palsied children who were diagnosed as being handicapped in a *Mild*, *Moderate* or *Severe* degree by cerebral palsy.

Table 19: COMPARISON OF I.Q.'S ON THE SOUTH AFRICAN INDIVIDUAL SCALE OF CHILDREN WHO ARE MILDLY, MODERATELY AND SEVERELY HANDICAPPED BY CEREBRAL PALSY

I.Q.	Mild	Mod.	Severe	Total
25-29.....	—	—	1	1
30-34.....	—	—	1	1
35-39.....	—	1	—	1
40-44.....	1	3	1	5
45-49.....	3	1	1	5
50-54.....	4	2	1	7
55-59.....	3	4	2	9
60-64.....	6	10	1	17
65-69.....	3	7	4	14
70-74.....	6	5	7	18
75-79.....	8	11	5	24
80-84.....	2	6	5	13
85-89.....	9	3	4	16
90-94.....	6	7	1	14
95-99.....	6	6	3	15
100-104.....	4	4	1	9
105-109.....	3	2	1	6
110-114.....	2	3	—	5
115-119.....	2	1	—	3
120-124.....	2	1	—	3
125-129.....	2	—	—	2
130-134.....	1	—	—	1
TOTAL.....	73	77	39	189
Mean.....	83.30	78.10	73.92	79.54
S.D.....	4.33	3.82	3.50	19.84
S.D. _M	0.50	0.43	0.56	1.44

The three groups have the following means:—

Mild: 83.30 (S.D. 4.33); *Moderate*: 78.10 (S.D. 3.82); *Severe*: 73.92 (S.D. 3.50). The differences between these mean I.Q.'s are considerable, and statistically significant, as may be seen in Table 20.

Table 20: DIFFERENCES BETWEEN MEAN I.Q.'S OF MILD, MODERATE AND SEVERE GROUP OF C.P. CHILDREN

Groups Compared	Difference between Means (D)	S.D. of D.	C.R.	P.
Mild and Moderate.....	5.20	0.66	7.88	.01
Moderate and Severe.....	4.18	0.71	5.89	.01

The critical ratio's are significant. Since the C.R. of the differences in Mean I.Q.'s between the Mild and Moderate Groups on the one hand and Moderate and Severe Groups on the other hand are significant, therefore it is assumed that the C.R. of the difference in the mean I.Q.'s between the Mild and Severe groups will also be significant.

(The Mean I.Q. of the Mild group is higher than the Mean I.Q.'s of the Moderate and Severe groups.)

5. As stated previously there were 15 pupils, 11 boys and 4 girls, tested with Group Intelligence Tests. They were all in high school, and all were spastics. Eight pupils were tested with the Old South African Group Test, and 5 with the New South African Group Test. Since the I.Q.'s on these tests cannot be compared directly, these 15 I.Q.'s were also transferred to the so-called "Estimated" I.Q.'s.

6. All psychologists working with cerebral palsied children have experienced testing situations in which they have felt that they could not in all honesty say that the child has attained such-and-such an I.Q. They have, however, after examination, felt pretty certain that they could guess that the I.Q. would be between certain limits. With this in mind, it was felt that it would be a pity not to make use of the information for what it might be worth. One is fully aware of the futility of pinning one's hope and faith to an "I.Q." Nevertheless an awareness of the probable level of intellectual functioning of a cerebral palsied child is useful information to the psychologist and to the teacher and therapist working with the child.

In studying the completed forms it soon became apparent that these so-called "estimated" I.Q.'s were in actual fact I.Q.'s which had been arrived at after using some or other (overseas) standardised test, the name of which had been written down in Part IV (A) of the Form, together with the specific I.Q. which had been attained. In some cases a cross had been made in Part IV (B). The 15 I.Q.'s derived from the South African Group Tests were also transferred to IV (B).

Originally it had not been the intention to use the data in IV (B) for setting up a distribution of I.Q.'s to compute a mean I.Q. Fortunately, however, it proved possible to set up a distribution with step intervals of 10 I.Q. points ranging from 10-129, because, either the actual I.Q.'s had been given, or in most cases it so happened that an "X" had been made in blocks with a 10 point interval.

A total of 106 “estimated” I.Q.’s were drawn up in this distribution, and are reflected in Table 21. The median I.Q. is at 70·6 and the mean I.Q. is 69·1.

Table 21: I.Q.’s ESTIMATED BY COMPETENT PSYCHOLOGISTS

I.Q.	N
10-19	1
20-29	2
30-39	8
40-49	19
50-59	7
60-69	15
70-79	17
80-89	18
90-99	8
100-109	8
110-119	2
120-129	1
TOTAL	106
Median ..	70·6
Mean I.Q. . .	69·1
SD	23·17
SDM	2·25

The mean I.Q. of this group is 10·44 lower than the mean I.Q. found in the group tested with the Individual Scale. This difference is statistically significant. (Critical Ratio: 4·1). Since the results obtained by means of an intelligence test standardised in South Africa are compared with a mixture of I.Q.’s derived by various means, this difference quite definitely should not be taken seriously. However these findings tend to confirm the observed trend seen in the results of the Individual Scale, i.e. for cerebral palsied children to function well below the average level of mental ability of the general school population.

7. When testing cerebral palsied children with intelligence tests the criticism is often heard that these children can really never be properly tested, that their “I.Q.’s” are not a true reflection of their mental ability.

To obtain data relating to the validity of this criticism the Schools were asked to “Comment” on the I.Q.’s, by completing the following:—

“This child seems to be functioning—

At () Below () Above () this I.Q.”

An “X” had to be placed in the appropriate block.

The Principals were asked to discuss this point thoroughly with the staff members who knew the pupils and with the psychologist concerned.

The data is arranged in Table 22.

Table 22: JUDGMENTS OF STAFF MEMBERS AS TO THE "CORRECTNESS" OF THE I.Q.'S PROCURED BY MEANS OF A STANDARDISED SOUTH AFRICAN INTELLIGENCE TEST

The child was functioning—	Number	%	Interpretation of the Staff's views
AT.....	141	69·5	I.Q. correct
BELOW.....	51	25·1	I.Q. too favourable
ABOVE.....	11	5·4	I.Q. too low
the I.Q. indicated			
TOTAL.....	203	100	

It is not without significance to note that in more than two-thirds of the test results the teachers were of opinion that the children were functioning in accordance with what is generally expected of children with those I.Q.'s.

In one-quarter of the cases the test result gave too much credit to the child, according to the teacher. This is not an uncommon occurrence even with normal children. In one-twentieth of the cases the test result apparently did not do justice to the child's mental ability.

The significant fact emerging from this aspect of the study is the high number of apparently correct mental measurements. This is especially significant when one bears in mind the difficult problems encountered when testing cerebral palsied children. It also emphasises the necessity for close collaboration between psychologist and teacher. In the event of an underestimation of intelligence it enables the psychologist to re-examine his technique and to reappraise the child, as happens with normal children who have not done well in a test. In the case of a so-called over-estimation the knowledge can be useful to the teacher in re-examining her teaching techniques since, it is almost certain that a child cannot score higher than his ability allows him.

In view of the well-known fact that cerebral palsied children have great difficulty with concentration, persistence, etc. the finding by teachers that 25% have had a too high estimation of intelligence is not surprising. The test situation is such that the child is constantly exposed to changing stimuli which keep his attention. Attention is required for relatively short periods, which are alternated by short rest periods while the psychologist selects the next items in the test. The face-to-face situation is conducive to maintaining high motivation in the cerebral palsied child. The psychologist is accordingly able to command a high level of maximum attention and effort throughout the test situation, which is often not the case in the classroom.

One is justified in saying that, by and large, the psychological testing of the psychologists has been highly satisfactory, and that their assessments indicate what might be expected of the abilities of the cerebral palsied children. This conclusion is based on the judgement of the teachers who know the children well, and who judged the test results by the child's proven ability in the classroom. For the sake of clarity it should be repeated that these comments were applicable only to I.Q.'s derived by using standardised South African intelligence tests. The position would be different in the case of children too young or too badly impaired to allow of routine intelligence testing, and requiring what may be termed an "informed and considered" guess at the I.Q. by the psychologist.

CHAPTER 6

SCHOOL CLASSES AND SCHOOL WORK

1. An attempt was made to procure data on the current level of scholastic work of each pupil in the primary school, i.e. Grade 1 (Sub A)—Std. 5, and the Special Class.

2. The explanations and instructions were as follows:—

“It is often most difficult to classify the scholastic status of a cerebral palsied child according to the accepted criteria for normal children, namely by school standard. However, it is possible, after due deliberation, to decide that a pupil is doing scholastic work in the basic skills of arithmetic, reading, and language usage between certain upper and lower limits. For instance, Johnny might be reading out of a Beacon Reader (English) for Std. 2. He is reading out of a Dagbreek Leesboek (Afrikaans) for Std. 1, and doing Arithmetic at a low Std. 1 level, or high Sub B or Grade 2 level. He cannot write, having a severe hand involvement, but his language work—sentence structure, and spelling—is at Std. 1 level. All-in-all one could rate him at about Std. 1 level of scholastic ability.”

3. The teachers were then asked to rate each child in the primary classes on “the level of proficiency attained in English, Afrikaans, and Arithmetic, as well as the “average” level of all his work. *The rating must be in terms of comparison with the ordinary (normal) school standard.* The final criterion in determining the “average” level of work, could be stated thus: “Ignore his physical disabilities which prevent proper functioning in the class room. According to this child’s knowledge and mental mastery of scholastic work—into which ordinary school standard would he best fit?”

4. When completing Part V of the Questionnaire, the reporting officers who were dealing with children in pre-school or nursery school classes, wrote in the word “Nursery” or “Pre-School” and left Parts V A & B blank.

5. The data on the scholastic status of 232 pupils in Grade 1—Std. 5, and the Special Class, are grouped in Table 23.

6. Reading across the page in Table 23, data are presented on the numbers of pupils in each class, and the level of proficiency which they have attained in the three basic subjects: English (E), Afrikaans (A), Arithmetic (R). Thus, in Grade I there are 36 pupils doing English at Grade I level, 1 is doing English at Grade II level, and there is no information about the proficiency in English of 23 pupils (i.e. 38·3%). There are 21 pupils doing Afrikaans at Grade I level, 5 at Grade II level, and no information about 34 (56·6%). There are 52 doing Arithmetic at Grade I level, 2 at Grade II level, and no information about 6 pupils (10%). All these pupils would best fit into a Grade I or Sub. A class, for purposes of comparison with normal school classes.

7. It immediately strikes one that quite a number are working below or above their “average class level” in one or more of the three subjects.

Table 23: SCHOLASTIC STATUS OF 232 PUPILS IN PRIMARY STANDARDS

Class Groups	Grade 1			Grade 2			Std. 1			Std. 2			Std. 3			Std. 4			Std. 5			Spec. Class			No Data						Total			
	E	A	R	E	A	R	E	A	R	E	A	R	E	A	R	E	A	R	E	A	R	E	A	R	E	A	R	Eng-lish		Afri-kaans		Arith-metic		N
	N	%		N	%		N	%		N	%		N	%		N	%		N	%		N	%		N	%		N	%	N	%	N	%	N
Grade 1	36	21	52	1	5	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23	38·3	34	56·6	6	10·0	60
Grade 2	7	8	3	19	18	30	—	1	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	38·1	15	35·7	2	4·8	42
Std. 1..	—	—	—	5	4	3	20	24	29	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	18·7	2	6·0	—	—	32
Std. 2..	—	—	—	—	3	1	4	5	2	25	21	25	1	1	2	—	—	—	—	—	—	—	—	—	—	—	—	1	3·2	1	3·2	1	3·2	31
Std. 3..	—	—	—	—	—	—	1	3	—	3	1	—	9	7	12	—	2	1	—	—	—	—	—	—	—	—	—	2	13·3	2	13·3	2	13·3	15
Std. 4..	—	—	—	—	—	—	—	1	—	—	1	—	—	2	3	7	5	7	3	1	—	—	—	—	—	—	—	1	9·1	1	9·1	1	9·1	11
Std. 5..	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	4	1	2	9	9	10	—	—	—	—	—	—	2	13·3	2	13·3	2	13·3	15
Spec. Class..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25	26	23	1	3·8	—	—	3	11·5	26
TOTAL...	43	29	55	25	30	36	25	35	38	29	25	25	10	10	17	11	8	10	12	10	10	25	28	24	52	—	57	—	17	—	—	—	232	

8. Table 24 presents the data in a different form. The pupils about whom no data were available were excluded. All the “pupils” in a particular class about whom information is given in Table 23 were totalled. Each frequency is counted separately. In this way a pupil taking English, Afrikaans and Arithmetic is counted as 3. For instance, Grade II: There are 67 pupils working at Grade II level in English, Afrikaans and Arithmetic ($19 + 18 + 30 = 67$); 18 pupils are working *below* Grade II level in at least one subject, and 8 pupils are working *above* Grade II level in at least one subject. Total: 93.

Table 24. LEVEL OF WORK IN INDIVIDUAL SUBJECTS AS COMPARED WITH THE “AVERAGE” LEVEL.

Level of work in individual subjects compared with “average” class level.	Grade 1		Grade 2		Std. 1		Std. 2		Std. 3		Std. 4		Std 5	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Below.....	—	—	18	19	12	14	15	17	4	11	7	23·3	7	20
At.....	109	93	67	72	73	83	71	79	28	80	19	63·3	28	80
Above.....	8	7	8	9	3	3	4	4	3	9	4	13·3	—	—
	117	100	93	109	88	100	90	100	35	100	30	100	35	100

9. From Table 24 it is evident that the majority of the pupils about whom information was received are actually doing work at the level of the normal school standards into which they are said to fit. However, it is also quite clear from Table 23 that it should be expected that some pupils will be retarded as much as three or four years in some of their school subjects. None of the cases reported here is advanced by more than one year on the “average level” of their class work.

10. This method of determining the “average” school standards of the pupils in the primary classes was employed because quite often a cerebral palsied child in the primary school will show irregular levels of scholastic attainment in the various subjects.

11. Cerebral palsy pupils in the secondary or high school have overcome these difficulties, or have never experienced them, and accordingly this rating method was not used.

12. In the Secondary School and in High School there were only 27 pupils, or 7·1% of the total group of 380. They were in the following classes:—

- Std. 6: 15.
- Std. 7: 7.
- Std. 8: 3.
- Std. 9: 1.
- Std. 10: 1.

13. Table 25 provides information on the standard-age distribution of 380 pupils.

14. In Table 25 there are four groups of pupils:

Preschool: Pupils not yet doing formal school work.

Primary School: Grade I (Sub. A)—Std. 5, and Special Class.

Secondary or High School: Std. 6–10.

No School: Children who were not attending “school” in the accepted sense of the word, not even nursery school classes.

Table 25: STANDARD-AGE DISTRIBUTION

Class Groups	Age in Years																					Total Pupils in Classes			% of normal pupils in each primary class in Union of South Africa	Total No. pupils in primary classes in Union of South Africa
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+	N	%	Cumulative %		
Pre-School.....	2	6	11	17	26	14	13	3	3	1	2	3	2	1	—	1	—	—	—	—	—	105	27·6	—	—	
<i>Primary School:</i>																										
Grade 1.....	—	—	—	—	1	5	15	10	12	8	4	2	1	1	1	—	—	—	—	—	—	60	25·9	25·9	14·8	63,346
Grade 2.....	—	—	—	—	—	1	4	4	7	7	6	5	2	3	—	1	1	—	1	—	—	42	18·1	44·0	14·3	61,195
Std. 1.....	—	—	—	—	—	—	1	4	2	9	3	3	5	2	1	2	—	—	—	—	—	32	13·8	57·8	14·6	62,431
Std. 2.....	—	—	—	—	—	—	—	1	4	4	6	4	8	1	1	—	—	2	—	—	—	31	13·3	71·1	14·6	62,352
Std. 3.....	—	—	—	—	—	—	—	—	1	2	3	4	2	—	1	—	—	1	—	1	—	15	6·5	77·6	13·6	58,204
Std. 4.....	—	—	—	—	—	—	—	—	—	—	—	3	4	—	1	3	—	—	—	—	—	11	4·7	82·3	13·8	58,748
Std. 5.....	—	—	—	—	—	—	—	—	—	1	—	—	3	4	4	1	1	—	—	—	—	15	6·5	88·8	12·0	51,043
Special Class.....	—	—	—	—	—	—	2	2	1	—	1	2	1	2	—	3	—	5	—	2	5	26	11·2	100·0	2·3	9,896
Sub-total.....	—	—	—	—	1	6	22	21	26	29	23	22	28	15	8	11	2	9	1	3	5	232	61·1	—	100·0	427,215
<i>Secondary School:</i>																										
Std. 6.....	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2	4	2	2	2	1	1	15	55·6	—	—	
Std. 7.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	1	2	1	—	—	—	7	25·9	—	—	
Std. 8.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	—	—	3	11·1	—	—	
Std. 9.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	3·7	—	—	
Std. 10.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	3·7	—	—	
Sub-total.....	—	—	—	—	—	—	—	—	—	—	—	—	—	1	5	6	5	4	3	1	2	27	7·1	—	—	
No School.....	—	1	1	—	—	1	2	1	1	1	1	—	—	1	1	1	—	—	—	3	1	16	4·2	—	—	
TOTAL.....	2	7	12	17	27	21	37	25	30	31	26	25	30	18	14	19	7	13	4	7	8	380	100%	—	—	

There were 105 children attending *pre-school* or nursery school classes. Their ages ranged from 1 year to 16 years. They formed 27·6% of the total group of 380 children.

In *primary school classes* there were 232 children, or 61·1% of the total group. Their ages ranged from 5–21 years and over.

At *secondary or high school* there were 27 children, or 7·1% of the total group. Their ages ranged from 14–21 years and over.

No school was being attended by 16 children, or 4·2% of the total group. Their ages ranged from 2–21 years.

15. One learns from this table that there are 65 children below the age of 6 years, most of whom were attending one of the four cerebral palsy schools. There were 20 pupils older than 16 years actually in primary classes, and 11 pupils were in their sixteenth year. (An additional 4 were not attending any school). In the high schools there were 15 pupils older than 16 years, of whom 8 were in Std. 6, 3 in Std. 7, 3 in Std. 8, and 1 in Std. 10. These high school pupils were all at the Kimberley Schools for physically handicapped children.

16. In Table 25, the last column but four on the right contains the total number of children in the various classes. Referring only to the Primary School, the last column but three gives the percentages which each class group forms of the whole cerebral palsied primary school group ($N = 232 = 100\%$). In the last column but two cumulative percentages, based on the percentages of the previous column are given. For comparative purposes the percentages which all the European pupils in the various primary school classes in the whole of the Union of South Africa form of the whole primary school group in the Union are set down in the last column but one, whilst total figures for European children attending primary school classes throughout South Africa are in the last column.

17. From these data it is apparent that slightly more than one fourth (25·9%) of cerebral palsied children at primary school are in Grade I. This is almost twice as much as the percentage of children attending Grade I throughout South Africa. In Grade II the percentage is slightly higher for Cerebral Palsy Schools than for the Union (18·1% and 14·3%). In Std. I the percentage is actually less (13·8% and 14·6%), and in Std. II it is also less (13·3% and 14·6%). In Std. III–V the percentages in Cerebral Palsy Schools are almost one-half to one-third of the percentages in the Union. (Std. III: 6·5% and 13·6%; Std. IV: 4·7% and 13·8%; Std. V: 6·5% and 12·0%). There are almost 5 times as many children in the special classes in cerebral palsy schools as in the special classes at the regular schools (11·2% and 2·3%). This can be explained by referring to the fact that as a group, the cerebral palsied children have lower intelligence quotients than the normal children, and one may therefore, proportionately expect more retarded children amongst them. The physical handicaps of the cerebral palsied children also hinder their progress.

18. Table 26 presents the data of age and school grouping in a different context, and has information about the numbers of boys and girls, and their mean ages.

19. The first column in Table 26 contains the ages in one-year step-intervals. The following columns present data on boys and girls in the pre-school, primary school, and high school groups, and children not attending school. Totals are then given for all the boys (M) and girls (F) and the last column contains the total number of children in each age group.

Table 26: AGE, MALE AND FEMALE, IN SCHOOL GROUPS

Age in Years	Pre-school		Primary		High School		No School		Total		Total
	M	F	M	F	M	F	M	F	M	F	M + F
1	1	1	—	—	—	—	—	—	1	1	2
2	6	—	—	—	—	—	1	—	7	—	7
3	7	4	—	—	—	—	1	—	8	4	12
4	12	5	—	—	—	—	—	—	12	5	17
5	15	11	—	1	—	—	—	—	15	12	27
6	8	6	3	3	—	—	1	—	12	9	21
7	2	11	14	8	—	—	—	2	16	21	37
8	—	3	13	8	—	—	1	—	14	11	25
9	1	2	11	15	—	—	1	—	13	17	30
10	1	—	21	8	—	—	1	—	23	8	31
11	—	2	14	9	—	—	1	—	15	11	26
12	—	3	13	9	—	—	—	—	13	12	25
13	1	1	18	10	—	—	—	—	19	11	30
14	1	—	5	10	—	1	—	1	6	12	18
15	—	—	4	4	4	1	—	1	8	6	14
16	—	1	6	5	5	1	1	—	12	7	19
17	—	—	1	1	4	1	—	—	5	2	7
18	—	—	5	4	2	2	—	—	7	6	13
19	—	—	1	—	3	—	—	—	4	—	4
20	—	—	3	—	1	—	1	2	5	2	7
21+	—	—	5	—	2	—	—	1	7	1	8
Total	55	50	137	95	21	6	9	7	222	158	380
Mean...	5.32	7.08	12.1	11.2	17.79	16.67	9.44	14.8	10.87	10.60	10.76
Median...	5.10	6.67	11.46	11.4	17.37	16.5	9.5	14.5	10.57	9.94	10.39
S.D.....	2.41	2.905	3.71	3.14	1.88	1.46	—	—	4.95	4.14	4.63
S.D.M...	.32	.41	.32	.32	.41	.59	—	—	.33	.33	.24
Groups Compared					Diff.	S.D. of D.	C.R.	P.			
Preschool: Male and Female.....					1.76	.52	3.4	.01			
Primary: Male and Female.....					.9	.45	2.0	.01			
High School: Male and Female.....					1.12	.72	1.55	.10			
Total: Male, Female.....					.27	.47	.57	.10			

20. In the pre-school group the numbers of boys (55) and girls (50) are about equal. Their mean ages (boys, 5.32 years; girls, 7.08 years) differ by 1.76 years, the girls being older than boys. This difference is statistically significant at the 1% level of confidence. This seems to point to a tendency for parents to be reluctant to send the little girls to cerebral palsy schools at as early an age as little boys.

21. In the primary school group there are 137 boys and 95 girls. The mean age of the boys is 12.1 years and of the girls 11.2 years. This difference of 0.9 years (10.8 months) is statistically significant at the 1% level of confidence. Here the boys are the older group.

22. The high school group has 21 boys and 6 girls. Their mean ages are: boys, 17.79 years, girls, 16.67 years. This difference is not statistically significant. It is not clear why so few cerebral palsied girls are in high school. One wonders whether this indicates a lack of interest, or a lack of ability (mental or physical) on the part of cerebral palsied girls to do high school work. As Chapter 5, on intelligence, has shown there is no significant difference in mean intelligence between the cerebral palsied boys and girls. In Chapter 2 it has been demonstrated that the ratio of the total group of boys to girls is roughly 3:2. This ratio is maintained when the numbers of boys and girls within the groups Mild, Moderate and Severe are compared. In Chapter 3, on the physical disablement, it has also been shown that there is a probability as high as 95% that chance factors are the cause of the differences between the numbers of boys and girls in the groups Mild, Moderate and Severe cerebral palsy. Therefore, disability *per se* does not prevent girls from attending high school.

23. These 27 high school pupils were in the following classes:—

- Std. 6: 15.
- Std. 7: 7.
- Std. 8: 3.
- Std. 9: 1.
- Std. 10: 1.

They were all at the Kimberley schools for the physically handicapped. They were taking the following courses:—

Course	Male	Female	Total
General course	2	1	3
Commercial course	6	—	6
Domestic Science	—	3	3
Watchmaking	1	—	1
Orthopaedic Bootmaking ..	4	—	4
Orthopaedic Technician	2	—	2
No information	6	2	8
Total	21	6	27

Since there are only 27 cerebral palsied children in secondary or high school one wonders whether sufficient use is being made of the facilities for high school education and post-primary vocational education which are available at the Kimberley schools.

24. The distribution of the pupils in the various classes according to the different clinical categories is set out in Table 27.

Table 27: DISTRIBUTION OF PUPILS ACCORDING TO SCHOOL CLASSES AND CLINICAL CATEGORIES

Class	Spastic		Athetoid		Rigid		Ataxia		Brain Injury		Mixed		Total M+ F
	M	F	M	F	M	F	M	F	M	F	M	F	
Pre-School.....	24	29	15	6	—	—	1	3	8	5	7	7	105
Grade 1.....	21	19	4	2	—	—	3	2	1	—	4	4	60
Grade 2.....	13	13	6	2	—	—	2	1	3	—	2	—	42
Std. 1.....	11	9	3	1	—	—	—	—	—	—	4	4	32
Std. 2.....	8	8	7	1	1	1	1	1	—	—	3	—	31
Std. 3.....	7	5	2	—	—	—	—	—	—	—	—	1	15
Std. 4.....	5	4	—	2	—	—	—	—	—	—	—	—	11
Std. 5.....	5	5	2	1	—	—	—	1	—	—	—	1	15
Sp. Class.....	14	4	4	1	—	—	—	—	—	—	1	2	26
Sub. Total.....	84	67	28	10	1	1	6	5	4	—	14	12	232
Std. 6.....	11	2	1	—	—	—	1	—	—	—	—	—	15
Std. 7.....	4	3	—	—	—	—	—	—	—	—	—	—	7
Std. 8.....	2	1	—	—	—	—	—	—	—	—	—	—	3
Std. 9.....	1	—	—	—	—	—	—	—	—	—	—	—	1
Std. 10.....	1	—	—	—	—	—	—	—	—	—	—	—	1
Sub. Total.....	19	6	1	—	—	—	1	—	—	—	—	—	27
No School.....	4	2	4	1	—	—	—	1	—	—	1	3	16
TOTAL.....	131	104	48	17	1	1	8	9	12	5	22	22	380

The information in Table 27 is complementary to the information about the composition of the sample (Chapter 2).

25. Table 28 offers a comparison between the average ages of school children in the primary classes in all the schools in South Africa, and the cerebral palsied children of this group who are in primary classes.

Table 28: MEAN AGES OF PRIMARY SCHOOL CHILDREN IN SOUTH AFRICA, AND CHILDREN IN PRIMARY CLASSES OF CEREBRAL PALSY SCHOOLS IN SOUTH AFRICA

Classes	Normal Children: 1956			Cerebral Palsy Children: 1957				Difference in Mean Age.			
	Number	Mean Age.		S.D.	Number.	Mean Age.		S.D.			
		Yrs.	Mo.			Yrs.	Mo.	Yrs.	Mo.		
Grade 1.....	63,346	6	6	7	60	9	2	2	0	2	8
Grade 2.....	61,195	7	6	8	42	11	1	2	9	3	7
Std. 1.....	62,431	8	6	9	32	11	7	2	4	3	1
Std. 2.....	62,352	9	6	9	31	12	2	2	0	2	8
Std. 3.....	58,204	10	8	10	15	14	0	2	7	3	4
Std. 4.....	58,748	11	9	10	11	14	3	1	7	2	6
Std. 5.....	51,043	12	9	10	15	15	0	1	8	2	3
Std. 6.....	51,131	14	0	12	15	17	8	1	11	3	8
Spec. Class. ...	9,896	13	4	Yrs. Mo. 2 3	26	15	10	4	8	2	6

School classes are listed in the first column. The next three columns pertain to the numbers and mean ages and standard deviations of all the European children in primary classes in South Africa. The last column contains similar information about this group of cerebral palsied children.

The data in regard to normal children were obtained on the basis of 1956 returns of educational statistics as rendered by schools on the 1st Tuesday in June, 1956. The distributions were set up on the basis of 1-year step intervals for the calculation of the means.

The ages of the cerebral palsied children were calculated as for the 30th September, 1957.

26. From Table 28, the following is apparent:—

- (a) Cerebral palsied children have a higher mean age than the average age for South African children in the same class. Cerebral palsied children are 2 years 11 months older on an average.
- (b) Whereas the standard deviation for all children in South African schools varies between 7 months and 12 months from Grade 1 through Standard 6, the standard deviation in cerebral palsy schools varies between 1 year and 7 months, and 2 years and 8 months. The standard deviation in the so-called Special Classes in cerebral palsy schools is twice that of the Special Classes in the other schools. This means that the range of ages in classes in cerebral palsy schools is much greater than in classes in ordinary schools.

CHAPTER 7

CONCLUSION

1. This Survey arose out of the need of the Management Committee of the Cerebral Palsy Division of the National Council for the Care of Cripples in South Africa to be able to make realistic plans for the care of the adult with cerebral palsy.

2. This Survey has presented a factual analysis of the physical and mental status of cerebral palsied children who were in need of special educational provision and who were at school in the latter half of 1957.

3. From this Survey a few facts pertinent to planning for the care of these children when they leave school have emerged:—

4. (1) The ratio of males to females is 3: 2.
- (2) The ratio of Afrikaans-speaking children to English-speaking children is not quite 1: 1. Those who speak Afrikaans are slightly in the majority in this group.
- (3) The average ages of boys and girls are about the same, despite the fact that the girls are significantly older than the boys in the pre-school group.
- (4) Boys are as mildly, or as severely, impaired as girls. The ratio of boys to girls within each group of Mild or Moderate or Severe remains 3: 2.
- (5) The ratio of the groups Mild: Moderate: Severe is 6: 7: 5. The cerebral palsied children tend to maintain their categories of Mild, Moderate or Severe impairment as they grow older. This does not imply that a particular child might not be reclassified from mild to moderate, or from moderate to severe or vice versa. The implication is that taken as a total group these reclassifications will balance each other. One child moving from Mild to Moderate will, for example, be balanced by another child's reclassification from Moderate to Mild.
- (6) The mean intelligence of this group of children is far below the average for normal children. It is estimated that 117 or 30·7% of these children have intelligence quotients of 90 or higher, that is I.Q.'s in the average or higher range. Little more than half of these children (53·4%) have I.Q.'s below 80, and 15·9% fall in the dull-normal range of I.Q.'s, that is I.Q.'s 80-89.
- (7) Table 29 classifies 189 children who have cerebral palsy in a Mild, Moderate or Severe degree according to intelligence levels.

Table 29

I.Q.	Mild	Moderate	Severe
25-49.....	4	5	4
50-69.....	16	23	8
70-79.....	14	16	12
80-84.....	2	6	5
85-89.....	9	3	4
90.....	28	24	6
TOTAL.....	73	77	39

(See Table 19.)

- (8) (a) It seems reasonable to expect the children with the diagnosis of Cerebral Palsy Mild (See Chapter 3 for definitions) and I.Q.'s above 70, provided they have the drive and initiative, to be able to make their own way when they leave school. That leaves 20, who on the basis of intelligence alone might be expected to need some form of custodial care when they leave school.
- (b) Since the children who have cerebral palsy to a *Moderate* degree, are worse off physically than the mild group, it is doubtful whether any of those with I.Q.'s below 80 will be able to become economically independent when they leave school. This is a group of 44 children who probably will need custodial care in some form.
- (c) Since the children diagnosed *Cerebral Palsy Severe* are so badly impaired, it seems improbable that any of them will be able to reach economic independence. Therefore the whole group is included when planning for custodial care: 39. From Table 19 it is clear that only 6 have I.Q.'s from 90-109. The rest are all below average in intelligence.
- (d) In the Mild group 20 children form 27.4% of 73. In the Moderate group 44 children form 57.1% of 77.
- (e) One may therefore argue that on the basis of these percentages the following would be the least number of children out of the total group of 380 who would probably need some form of custodial care when they leave school:—

Mild group: 27.4% of 128	35
Moderate group: 57.1% of 149	85
Add the whole of Severe group	103
TOTAL	<u>223</u>

When other factors, such as lack of drive, and initiative, inconstancy of performance and inability to maintain attention are considered then the probability that this group needing

custodial care will increase is quite probable. Table 11 demonstrated that 65% showed an inability to persist in their tasks. More than half were unable to maintain the concentration of their attention.

- (9) It should be noted that only 27 out of 380 children are doing school work from Std. 6–10. From Table 25 it is clear that 15 of these 27 children are in Std. 6. There are 7 in Std. 7 and 3 in Std. 8, and 1 each in Stds. 9 and 10. All the other children are below Std. 6 in scholastic status.

Inasmuch as a Std. 6 certificate is the minimum scholastic certificate required for most types of permanent employment where an advanced school certificate is not required, the outlook for the cerebral palsied children is distinctly gloomy.

- (10) Out of this group of 380 children there are 58 children (40 boys, 18 girls) who were 16 years or older at the time of the Survey, and 21 of this group were at that time in Std. 6–10. This leaves 37 who are older than 16 and who probably at any stage now will be needing some form of care.

5. When a researcher leaves the safe ground of historic fact and statistical analysis of proven data for the uncertain and very often untenable role of a prophet of future events then he is indeed on dangerous ground. However, for purposes of planning for the future it is sometimes necessary to attempt to deduce the probable from the known. This has been attempted in the foregoing paragraphs. It has been very conservatively done. It is, for instance doubtful whether cerebral palsied children in the *Mild* group with I.Q.'s between 70–84 would all be able to become economically independent, especially if they show the inconstancy of behaviour and performance so often seen in cerebral palsied children. That would bring an additional 16 or 21·9%. Bearing in mind the degree of handicap of the Moderate group one might be justified in adding the I.Q. 80–84 group to this number, which would then increase by a further 6 or 7·8%. This means adding 28 out of Mild, and 12 out of Moderate groups. These 40 children added to 223 selected in paragraph 8 (a) to (e) would raise the total to 263, or approximately 69·2% of cerebral palsied children who would be needing some form of care after they leave school.

6. A blind analysis based on group data and the identification of average trends in the group has severe limitations, since the individual has lost his identity. Nevertheless such an analysis does have its value in determining minimum requirements. As so often happens the intangible, and elusive, but nevertheless very real factors of personality and character determine much of an individual's future success or failure. The very fringe of the personality traits was touched by the attempt to measure 4 personality traits of these children by means of a rating scale. Accordingly it has not been possible to give due weight to the all important factors of personality and character in considering the future needs of these children. Knowing what one does of their inconstancy of behaviour and performance, and relating this to one's knowledge of the reluctance of employers to give this type of individual work, it seems reasonable to stress the conservative nature of the estimate of the numbers of cerebral palsied children who eventually, as adults, will need custodial care and a sheltered form of employment.

CHAPTER 8

SURVEY OF THE ADULT WITH CEREBRAL PALSY

1. All Cripples' Care Associations were circularised with forms and asked to submit returns. See Appendix "C".

2. Completed forms came in from the following Associations:—

Cripples' Care Associations in Pretoria, Johannesburg, Cape Town, Port Elizabeth, Witbank, Windhoek, Kimberley and the St. Giles Association in Durban, and Meerhof Hospital Extension at Hartebeestpoort.

3. A total of 174 forms were returned. Of these 37 forms concerned children of pre-school age, school age, or ineducable children of school age, and were therefore eliminated. A further 26 forms concerned adults, but were incomplete, or did not satisfy the criterion that each case should have been diagnosed as cerebral palsied by a medical doctor. They were accordingly eliminated. That left 111 forms which were analysed.

4. Sex: Male: 63; Female: 48.

The ratio of Males to Females is 4: 3 (1·31: 1).

5. Home Language.

Table 30

Home Language	M	F	Total
Afrikaans	38	17	55
English	16	18	34
Bilingual	—	2	2
Other Language	—	1	1
No data	9	10	19
TOTAL	63	48	111

There are 55 who speak Afrikaans at home, 34 who speak English, 2 who say they are bilingual, 1 speaks another language at home, and 19 gave no data.

6. Age.

Table 31

Age in Years	M	F	Total
15-19.....	11	15	26
20-24.....	14	9	23
25-29.....	12	8	20
30-34.....	8	3	11
35-39.....	8	5	13
40-44.....	2	5	7
45-49.....	3	2	5
50-54.....	4	—	4
55-59.....	—	—	—
60-64.....	—	1	1
No data	1	—	1
TOTAL	63	48	111

The age range is from 15 to 64 years.

The *mean age for men* is 29·6 years. S.D.: 9·9.

The *mean age for women* is 27·3 years. S.D.: 10·6.

The mean age for the total group is 28·8 years. S.D.: 10·4. This means that between the ages of 18·4 years and 38·2 years there is a total of 67 C.P. adults.

7. Use of hands for work.

Table 32

Description.	Male.		Female.		Total.	
	N	%	N	%	N	%
No difficulty using hands.....	21	33·3	12	25·0	33	29·7
Some difficulty using hands; one or both impaired.....	37	58·7	31	64·6	68	61·3
Cannot use hands at all.....	5	8·0	5	10·4	10	9·0
TOTAL.....	63	100·0	48	100·0	111	100·0

Out of this group of 111 Adults only 10 (9%) do not have any use at all of their hands. The rest are able to use at least one of their hands. But 33 (29·7%) have no hand impairment.

8. *Walking.*

Table 33

Description.	Male.		Female.		Total.	
	N	%	N	%	N	%
No difficulty walking.....	6	9.5	5	10.4	11	9.9
Some difficulty walking; with or without aid of appliances.....	43	68.3	29	60.4	72	64.9
Cannot walk at all.....	13	20.6	14	29.2	27	24.3
No data.....	1	1.6	—	—	1	0.9
TOTAL.....	63	100.0	48	100.0	111	100.0

There are 83 (74.8%) who are able to walk with or without the aid of appliances. This includes 11 who have no walking disability at all. There are 27 who cannot walk at all.

9. *Wheelchairs.*

Table 34

Description.	Male.		Female.		Total.	
	N	%	N	%	N	%
Uses wheelchair.....	14	22.2	16	33.3	30	27.0
Does not use wheelchair.....	39	61.9	26	54.2	65	58.6
No data.....	10	15.9	6	12.5	16	14.4
TOTAL.....	63	100.0	48	100.0	111	100.0

There are 30 (27%) who do use wheelchairs, while 65 (58.6%) use no wheelchairs. Of 16 no information is available.

Out of the 39 males who do not use wheelchairs there are 2 who cannot walk at all. All of the 26 females can walk.

10. *Employment.*

Table 35

Description.	Male.		Female.		Total.	
	N	%	N	%	N	%
In permanent employment.....	27	42.8	8	16.7	35	31.5
In temporary employment.....	—	—	1	2.1	1	0.9
In homebound employment.....	6	9.5	4	8.3	10	9.0
No employment.....	26	41.3	34	70.8	60	54.1
University student.....	1	1.6	—	—	1	0.9
No data.....	3	4.8	1	2.1	4	3.6
TOTAL.....	63	100.0	48	100.0	111	100.0

There are 35 (31·5%) in permanent employment; 1 was temporarily employed. In homebound work were 10 (9%); Unemployed were 60 (54·1%), while 1 was a student at University and of 4 nothing was known.

The 54·1% unemployed were divided into 26 males and 34 females.

11. *Wages.*

Table 36

Wages.	M	F	Total	%
£ 0- 99.....	3	2	5	4·5
100-199.....	3	2	5	4·5
200-299.....	4	3	7	6·3
300-399.....	7	2	9	8·1
400-499.....	7	1	8	7·2
500-599.....	2	—	2	1·8
600-699.....	1	1	2	1·8
700-799.....	1	—	1	0·9
800-899.....	1	—	1	0·9
900-999.....	—	—	—	—
1,000+.....	1	—	1	0·9
No Income.....	27	35	62	55·9
University student.....	1	—	1	0·9
Income but not stated.....	2	1	3	2·7
No data.....	3	1	4	3·6
TOTAL.....	63	48	111	100·0

These data pertain only to those who reported that they are employed. Those who are not employed have been omitted.

The average wage for men is: £386. 14s. 0d.

The average wage for women is: £268. 4s. 0d.

It is apparent that these cerebral palsied adults who are working do not command high salaries. There were 62 (27 males, 35 females) without any income whatsoever.

Males: Out of 63 males there were 33 who were in gainful employment, but data about actual income were submitted for only 30 males. There were 3 in the lowest income bracket, £0-99 per year, and there was 1 in the £1,000 + category. There were 24 with salaries below £500 p.a., and 6 with salaries of £500 and more per annum.

The returns indicated that 27 had no income.

Females: Table 35 shows that 13 females were in employment of some kind, but Table 36 shows data on the income of 11 females. They were 22·9% of the females. The lowest salaries were in the category of £0-99 and the highest in the £600-£699 bracket.

According to Table 35 there were 6 men and 4 women in homebound employment. Some of these did not submit data about their income. Those who did earned little.

12. *Disability grants.*

Table 37

Amount of Annual Grant	M	F	Total	%
£ 66.....	1	—	1	0·9
102.....	1	—	1	0·9
108.....	1	3	4	3·6
110.....	2	—	2	1·8
114.....	4	1	5	4·5
120.....	3	6	9	8·1
126.....	6	9	15	13·5
150.....	—	1	1	0·9
180.....	1	3	4	3·6
Sub-total.....	19	23	42	37·8
No grants.....	44	25	69	62·2
TOTAL.....	63	48	111	100·0

Only 19 males and 23 females were in receipt of disability grants. Details are set out in the table above. Since £126 per annum is the maximum disability grant payable by the State, the 5 individuals reflecting income higher than £126 must be in receipt of some other form of support as well—perhaps a disability grant from a former employer.

13. *Residence.*

Table 38

Description	Male		Female		Total	
	N	%	N	%	N	%
Resides in own home.....	8	12·7	7	14·6	15	13·5
Resides with parents.....	39	61·9	26	54·2	65	58·6
Boards with private people.....	6	9·5	6	12·5	12	10·8
Resides in Boarding House or Hotel.....	4	6·4	2	4·1	6	5·4
Resides in home for cripples or chronically ill	6	9·5	7	14·6	13	11·7
TOTAL.....	63	100·0	48	100·0	111	100·0

There are 15 who have their own home where they live.

Another 65 (58·6%) reside with their parents.

12 (10·8%) have to board with private people.

6 (5·4%) reside in a boarding house or hotel.

13 (11·7%) reside in a home for chronic sick people or cripples.

14. *Need for special accommodation.*

Table 39

Description	Male		Female		Total	
	N	%	N	%	N	%
Person needs special accommodation.....	14	22·2	22	45·8	36	32·4
Person does not need special accommodation	49	77·8	26	54·2	75	67·6
TOTAL.....	63	100·0	48	100·0	111	100·0

There are 36 (32·4%) cerebral palsied adults who require special accommodation (14 men, and 22 women). The others indicated that they did not need special accommodation.

15. *Discussion.*

(1) The purpose of this survey was to determine how many cerebral palsy adults were on the registers of Cripples' Care Associations, and to obtain information about the use that they have of their hands, their mobility, whether they were employed, what income they had, and where they lived.

(2) It would have been useful to have known something more about the type of cerebral palsy, the severity of their disabilities, etc., but experience had shown that the information in the files of Cripples' Care Associations is extremely meager. Some Associations complained that they could not supply even this limited information. In paragraph 3 it was shown that 26 forms had to be eliminated because the reporting Association could not state that the individual had been diagnosed by a doctor as having cerebral palsy. Moreover practically every one of the Tables in this Chapter shows that there were individuals about whom no data were available under some of the headings.

(3) In so far as these 111 cerebral palsied adults may be representative of the adult cerebral palsied population, the data in this chapter may be taken as an indication of the needs for financial help, and residential care of the adult with cerebral palsy.

16. *Conclusions.*

(1) Although 91% have partial or complete use of one or both hands (29·7% had complete use of both hands), and although 83% were mobile with or without the aid of appliances, and despite the fact that non-walkers can use wheelchairs, only 41·4% reported that they were employed. And of this last group 9% were in homebound employment.

(2) There are 36 (32·4%) of whom was reported that they needed special residential accommodation.

(3) If those receiving disability grants, and those in low income employment have no other sources of support then their economic plight is serious. Tables 36 and 37.

NATIONAL BUREAU OF EDUCATIONAL AND SOCIAL RESEARCH, Private Bag 122, PRETORIA
SURVEY OF CEREBRAL PALSIED PERSONS—RESEARCH PROJECT No. 0.8.

No.
 (Leave vacant)

Name: Sex Home Language Afrikaans English Other Date:

School Address: Birth Date:

Note.—*See accompanying "Schedule of Instructions" for explanations and nomenclature. Age:

I.* **DIAGNOSIS:** Mark appropriate blocks with "X". If "Mixed" is marked, then also mark clinical signs leading to diagnosis of Mixed. *Clinical Signs:* Spastic ; Athetoid ; Rigid ; Tremor ; Ataxia ; Br. Inj. ; Mixed ; C.P. Unspecified
Extremities: Monoplegia ; Hemiplegia R L ; Triplegia R L ; Paraplegia ; Only Arms ; Quadriplegia
Severity: Mild ; Moderate ; Severe

II.* **SURVEY OF DEGREE OF PHYSICAL HANDICAP:** Please rate this child on each of the six areas of physical function which are listed below. *Before making your rating,* please study carefully the additional descriptions for each category of the Degree of Physical Handicap as found in the accompanying "Schedule of Instructions". In each area decide whether the disability is present in Minimal, Mild, Moderate, or Severe degree. Then mark the appropriate block with an X. Under the column headed "Comments" be sure to draw a circle around the *eye, ear, arm/hand, leg* which is involved. E.g., if both legs are involved, then a circle should be drawn around both "Left leg" and "Right leg".

	NON-HANDICAPPING		HANDICAPPING		Comments
	Minimal	Mild	Moderate	Severe	
VISION.....	<input type="checkbox"/> No trouble with vision; no glasses needed	<input type="checkbox"/> Some correction needed; may wear glasses; not handicapped in seeing	<input type="checkbox"/> Quite handicapped in seeing; vision not correctible by glasses	<input type="checkbox"/> Almost blind; totally blind	Left eye Right eye
HEARING....	<input type="checkbox"/> No trouble with hearing	<input type="checkbox"/> Some difficulty hearing; may wear hearing aid satisfactorily	<input type="checkbox"/> Quite handicapped in hearing; has difficulty when wearing hearing aid	<input type="checkbox"/> Almost deaf; totally deaf	Left ear Right ear
SPEECH (verbal)	<input type="checkbox"/> Speech can be understood without difficulty by a stranger	<input type="checkbox"/> Some difficulty in being understood by a stranger; able to get ideas across in speech	<input type="checkbox"/> Speech hard for stranger or immediate family to understand; hard to transmit ideas in speech	<input type="checkbox"/> Almost totally unable to communicate by speech; totally without speech	
SITTING BALANCE	<input type="checkbox"/> No difficulty in sitting in a chair or at table	<input type="checkbox"/> Somewhat unsteady in sitting in a chair or at a table, but not handicapped in doing so	<input type="checkbox"/> Quite handicapped in sitting in a chair or at a table; needs a relaxation chair and tray	<input type="checkbox"/> Unable to maintain sitting balance unless fully supported	
ARM-HAND USE	<input type="checkbox"/> No difficulty in using arms and hands for self-help activity	<input type="checkbox"/> Some difficulty in using arms and hands for self-help, but not handicapped in doing so	<input type="checkbox"/> Quite handicapped in using arms and hands for many self- help activities	<input type="checkbox"/> Unable to use arms and hands for any self-help activity	Left arm/hand Right arm/hand
WALKING...	<input type="checkbox"/> No difficulty in walking	<input type="checkbox"/> Braces needed; un- steady gait; but able to get around	<input type="checkbox"/> Quite handicapped in walking; cannot walk independently	<input type="checkbox"/> Unable to walk	Left leg Right leg

III. **PERSONALITY REACTIONS.** Please rate this child on each of the personality traits listed below. Decide which of the four descriptions best describes his reaction pattern in terms of each trait, and mark the appropriate block with an "X".

<input type="checkbox"/> Persistence: Displays an extraordinary measure of persistence and tenacity	<input type="checkbox"/> Persists despite difficulties	<input type="checkbox"/> Will persevere for a while if task is not too difficult, or if task gives him satisfaction	<input type="checkbox"/> Is easily discouraged
<input type="checkbox"/> Disposition: Keenly interested and participates actively and with gusto in various experiences	<input type="checkbox"/> Is interested in the world. Bright and cheerful despite adversity	<input type="checkbox"/> Rather self-centred, easily upset by opposition	<input type="checkbox"/> Reserved, absorbed in self, unhappy, listless
<input type="checkbox"/> Sociability: Sociable and companionable. Actively interested in social activities. Seeks and enjoys company	<input type="checkbox"/> Normally makes friends	<input type="checkbox"/> Unsociable or retiring with only a few friends	<input type="checkbox"/> Solitary by choice does not make friends
<input type="checkbox"/> Concentration: Concentrates easily, well	<input type="checkbox"/> Concentrates satisfactorily	<input type="checkbox"/> Distractible	<input type="checkbox"/> Very easily distractible

IV. ***INTELLIGENCE:** (A) If reliable testing was possible:
 Name of Mental Test:.....
 Date Tested:..... Chron. Age..... M.A..... I.Q.
 Comment by School: Mark appropriate block with "X":—

(B) If child cannot be tested satisfactorily, *psychologist* should indicate at which level of intelligence child seems to be functioning, by marking appropriate I.Q. block:

0-29	30-49	50-59	60-79	80-89	90-109	110-119	120-129	130

AT This child seems to be functioning BELOW ABOVE this I.Q.

(C) Not tested nor assessed

V. ***SCHOOLING:** Complete *either* PRIMARY or SECONDARY schooling:

(A) *Primary:* English: Std.....Afrikaans: Std.....Arithmetic: Std....."Average" level of work: Std.....

(B) *Secondary School:* Std.....General Course ; Commercial ; Dom. Sc. ; Matric Exemp. ; Technical

If Technical Course, mark trade: Watchmaking ; Radio ; Tailor ; Orthop. Boots ; Orthop. Techn. ; Leatherwork ; Cabinetmaker ; General Workshop ; Other (Specify).

NATIONAL BUREAU OF EDUCATIONAL AND SOCIAL RESEARCH

PRIVATE BAG 122, PRETORIA

RESEARCH PROJECT No. 0.8

SURVEY OF CEREBRAL PALSIED PERSONS

SCHEDULE OF INSTRUCTIONS

1. *Diagnosis*

There are numerous classifications of types of cerebral palsy in use. For the purpose of this survey, and in order to facilitate the statistical computation of the data, broad classifications are sufficient. In order to ensure comparable diagnosis, please use the following classification by observable clinical signs, the extremities involved, and the severity of the disability:—

Clinical signs: Spasticity, Athetosis, Rigidity, Tremor, Ataxia, Brain-injury (Strauss and Lehtinen—without motor involvement), Mixed Type, Cerebral Palsy Unspecified. *Aphasias* in childhood (no motor involvement) must be grouped under *Brain-Injury*. If Mixed is marked to indicate a Mixed Type, *then the appropriate clinical signs should also be marked:* e.g. spastic (x).....Ataxia (x).....Mixed (x). *Cerebral Palsy unspecified* should be used if a diagnosis of cerebral palsy has been made, but the specific type cannot be determined. *This classification should only be used as a last resort.*

Extremities involved: Monoplegia; Hemiplegia, Right or Left, depending on whether both right extremities or both left extremities are involved; Triplegia Right or Left, depending on whether both right extremities or both left extremities are involved; Paraplegia (legs only); Only Arms; Quadriplegia.

Severity:

Mild: The patient needs no treatment as he has no speech problems, is able to care for his daily needs, and ambulates without the aid of any appliances.

Moderate: The patient needs special types of treatment since he is inadequate in self-care, ambulation and/or speech. Braces and self-help appliances are needed.

Severe: The patient needs treatment but the degree of involvement is so severe that the prognosis for self-care, ambulation and speech is very poor.

II. Survey of Degree of Physical Handicap

(According to the schedule compiled by Drs. Katz and Cohen of San Francisco).

The following are additional descriptions for each category:—

	NON-HANDICAPPING		HANDICAPPING	
	Minimal	Mild	Moderate	Severe
VISION.....	<input type="checkbox"/> No trouble with vision; no glasses needed Although eyes crossed at times, does not appear to have any difficulty in seeing	<input type="checkbox"/> Some correction needed; may wear glasses; not handicapped in seeing Needs to bring objects and pictures closer to eyes in order to see them more clearly. Can see, although left eye is turned inwardly and wears glasses. Does not see well from the right eye; seems to have fairly good vision in the left.	<input type="checkbox"/> Quite handicapped in seeing; vision not correctible by glasses	<input type="checkbox"/> Almost blind; totally blind.
HEARING.....	<input type="checkbox"/> No trouble with hearing	<input type="checkbox"/> Some difficulty in hearing; may wear hearing aid satisfactorily When spoken to in a low voice, experiences difficulty in hearing	<input type="checkbox"/> Quite handicapped in hearing; has difficulty when wearing hearing aid Hearing loss of about 50% in both ears	<input type="checkbox"/> Almost deaf; totally deaf. Frequently cannot understand the spoken word, unless the sentence embodies a short familiar word which can be lip read. Seems to have no understanding of the spoken word, but responds to gestured instructions on the part of the examiner.
SPEECH (Verbal)	<input type="checkbox"/> Speech can be understood without difficulty by a stranger Speech is clear and relevant, with a slight tendency to slur consonant sounds Speech is well-developed with very clear enunciation	<input type="checkbox"/> Some difficulty in being understood by a stranger; able to get ideas across in speech Some substitutions of consonant sounds give the impression of baby talk, and make it difficult at times for a stranger to understand Speech is fairly clear, although infantile substitutions are still noticed on more difficult words Tends to be somewhat slow and "sticky" in rate of expression Speech understandable, although somewhat slow-speaking Only single words are uttered spontaneously, usually names of objects Speech is slurred but understandable	<input type="checkbox"/> Speech hard for a stranger or immediate family to understand; hard to get ideas across in speech Speech consists of monosyllabic grunts and sounds, although in many instances the general characteristics of the word are present Speech is difficult to understand owing to slowness, poor articulation and drooling Speech mechanism is quite involved, making for difficulty in articulation, with resulting difficulty in being understood by strangers Can articulate some sounds, but is unable to put two words together, or to carry on conversation Does not talk except for a few syllables Speech is poor but partially understandable	<input type="checkbox"/> Almost totally unable to communicate by speech; totally without speech. Speech is constantly spontaneously produced, but seldom understandable. Speech mechanism is severely involved. Jabbers frequently in a very excited, garbled manner. Speech for the m unintelligible.

NON-HANDICAPPING		HANDICAPPING		
	Minimal	Mild	Moderate	Severe
SITTING BALANCE	<input type="checkbox"/> No difficulty in sitting in a chair or at a table Is sitting unsupported in a chair with feet in braces Sits unsupported	<input type="checkbox"/> Somewhat unsteady in sitting in a chair or at a table, but not handicapped in doing so Has some difficulty in balancing while sitting	<input type="checkbox"/> Quite handicapped in sitting in a chair or at a table; needs a relaxation chair and tray Experiences some difficulty in sitting in the conventional chair, but seems to be comfortable in the relaxation chair	<input type="checkbox"/> Unable to maintain sitting balance unless fully supported. Cannot sit independently except in a fully harnessed relaxation chair. Sits unsupported for only 20 seconds.
			Loses balance easily Sits alone for brief periods only Cannot sit by self; has to be propped in a chair Has a great deal of difficulty in controlling the neck muscles so that the head is constantly bobbing; making it difficult to sit in a chair	
ARM-HAND USE	<input type="checkbox"/> No difficulty in using arms and hands for self-help activity When doing fine manipulations, such as buttoning, a very mild tremor appears	<input type="checkbox"/> Some difficulty in using arms and hands for self-help, but not handicapped in doing so One arm is usable, but seems involved to the extent of making for some difficulty in operation. Nevertheless, is able to do rather complex tasks such as folding paper, using only one hand The physically involved side does not interfere markedly with ability to manipulate objects in tasks requiring motor coordination In spite of tremor of one hand, uses both hands equally well in manipulation Does an adequate job of drawing, despite very athetoid hands Uses one hand quite well, but other hand is used only rarely as a rather clumsy helper Requires some help with dressing because of impaired use of one arm	<input type="checkbox"/> Quite handicapped in using arms and hands for many self-help activities Both arms are quite involved, but he is able to write name with great effort Could lift and move small objects with the exercise of much effort Both arms are involved, with a marked tremor at times, but tends to use left hand for most functional activities Has difficulty holding a pencil or doing any of the tasks requiring finer coordination Can reach and grasp but cannot feed self There is slight involvement of the left arm, and more severe involvement of the right, which makes it difficult to effectively use both hands together	<input type="checkbox"/> Unable to use arms and hands for any self-activity. Uses a fist-like movement for picking up objects and cannot steady sufficiently to pile blocks. Cannot in any way feed self.

WALKING.....	<input type="checkbox"/> No difficulty in walking	<input type="checkbox"/> Braces needed; unsteady gait; but able to get around Walks with the instability of a drunkard A mild right hemiplegia gives an awkward gait Walks with a waddling gait, owing to the involvement of lower limbs Limps slightly while walking Limps favouring the left side Drags right leg when walking	<input type="checkbox"/> Quite handicapped in walking; cannot walk independently Able to walk when held up by hands or under arms by an adult Able to walk hanging on to things Has unsteady gait with frequent falls	<input type="checkbox"/> Unable to walk. Is in a full pelvic band, long-legged brace, but is unable to walk alone. Able to get around on the floor by "scooting" on side, using legs. Crawls on stomach. Lower extremities showed considerable deformity and lack of voluntary motion.
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III.—Personality Reactions

These need no further explanations.

IV.—Intelligence Rating

It is very difficult for a psychologist to obtain an intelligence rating of a severely impaired cerebral palsy child. Very often in such cases the psychologist is reluctant to commit himself to an I.Q. figure, and at the most he might be prepared to place the child in some rough grouping of intelligence levels. Where adequate I.Q. ratings have been made by a *competent psychologist*, experienced in the mental assessment of cerebral palsy children, please fill in Part IV (A). If more than one rating has been made, please take that rating giving the most favourable assessment of the child's intellectual ability. Sometimes a rating is obtained which does not agree with the level at which a pupil is functioning in the classroom. Under "Comments" there is an opportunity to indicate whether the School considers that the assessment is a fair one, or whether the child seems to be functioning *below* or *above* the assessed level. Place an "X" in the appropriate block.

PART IV (B).—If the psychologist is not prepared to commit himself in respect of a specific I.Q. figure, please complete Part IV (B).

It should be very clearly understood that Part IV (A) or (B) should not be completed unless a competent psychologist has assessed or attempted to assess the child. On no account should a "guess" be "hazarded" by a teacher or principal!

In completing the "Comments" in Part IV (A) it is of course most advisable and eminently desirable to discuss the comments with the psychologist and the staff members concerned. The same applies to Part IV (B).

If no testing was done, or assessment tried, Part IV (C) should be marked.

V.—*Present level of Scholastic Work (Part V).*

It is often most difficult to classify the scholastic status of a cerebral palsy child according to the accepted criteria for normal children, namely by school standard. However, it is possible, after due deliberation, to decide that a pupil is doing scholastic work in the basic skills of arithmetic, reading, and language usage between certain upper and lower limits. For instance, Johnny might be reading out of a Beacon Reader (English) for Std. 2. He is reading out of a Dagbreek Leesboek (Afrikaans) for Std. 1, and doing arithmetic at a low Std. 1 level or high Sub B or Grade 2 level. He cannot write, having a severe hand involvement, but his language work—sentence structure, and spelling—is at Std. 1 level. All-in-all one could rate him at about Std. 1 level of scholastic ability.

PART V (A) is to be completed for all C.P. pupils who are in the primary classes. Here ratings are desired of the level of proficiency attained in English, Afrikaans and arithmetic, as well as the “average” level of all his work. *The rating must be in terms of comparison with the ordinary (normal) school standard.* The final criterion in determining the “average” level of work, could be stated thus: ignore his physical disabilities which prevent proper functioning in the classroom. According to this child’s knowledge and mental mastery of scholastic work—into which ordinary school standard would be best fit?

PART V (B) is to be completed for all C.P. pupils who are in the secondary classes of school. The school standard is required. Mark the course for which the pupil is enrolled:—

General Course: Leads to Std. 8 or senior certificate, and then to employment in Civil Service or in clerical work.

Commercial: Std. 8 or senior certificate primarily with commercial subjects.

Domestic Science: Std. 8 or senior certificate primarily with domestic science subjects. If a pupil takes both Commercial and Domestic Science subjects, decide whether course is mainly Commercial or Domestic Science.

Matriculation Exemption: Allows admission to a university.

Technical: Pupil learns a trade. If the pupil is enrolled for a Technical Course please mark the trade that he is learning with an “X” in the appropriate block: Watchmaking, Radio Repairing, Tailoring, Orthopaedic Bootmaking, Orthopaedic Technician (appliance maker), Cabinet-making, Leatherwork, General Workshop (for pupils whose scholastic work is of too low a standard to enable them to enroll for an N.T.C. course, and who in fact are receiving a generalised type of workshop experience as “handlangers”).

National Bureau of Educational and Social Research,
Private Bag 122, Pretoria
SURVEY OF CEREBRAL PALSIED ADULTS
Research Project No. 0.8

Please return on or before 30th November, 1957

Name: Date:
Sex: Home Language: Afr. () Eng. () Other () Birth Date:
Address: Age:
Address of notifying Society:

MARK APPROPRIATE BLOCKS WITH "X"

1. This person was diagnosed as having Cerebral Palsy by a medical doctor. Yes () No ()
2. *Use of hands to work:*
No difficulty using hands.....()
Some difficulty using hands e.g. one or both hands impaired.....()
Cannot use hands at all.....()
3. *Walking:*
No difficulty walking.....()
Some difficulty walking (with or without aid of crutches and appliances)..... ()
Cannot walk at all.....()
4. *Wheelchair:*
Uses wheelchair.....Yes () No ()
5. *Employment:*

Specify type of work

In permanent employment ()
In temporary employment ()
In homebound employment () Give details:.....
No employment.....()
6. *Annual wage or income from employment (includes C.O.L.A.)*
Less than £99 () ; £100-£199 () ; £200-£299 () ; £300-£399 () ; £400-£499 () ; £500-£599 () ; £600-£699 () ; £700-£799 () ; £800-£899 () ; £900-£999 () ; £1,000 and over () ; No income () .
7. *Disability grant:*
Yes () . No () . State annual amount.....
8. *Residence:*
Own home () ; Parental home () ; Boards with private people () ; Boards in Boarding House or Hotel () ; Home for cripples or chronic ill () .
9. Does this person have need of special accommodation, e.g. in a home for cripples? Yes () . No () .

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