THE RELATIONSHIP BETWEEN SCHOLASTIC PERFORMANCE AND NEUROPSYCHOLOGICAL FUNCTIONING IN A SAMPLE OF INSTITUTIONALISED CHILDREN

by

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GLOSSARY OF MNEMONICS USED

	Descriptive Variables	
1	SEX	Sex of child
2	AGE	Age of child
3	AGEADM	Age admitted to Annie Starck Village
4	YRSASV	Years spent in A.S.V. (End date = July 1987)
5	YRSPSK	Years spent at pre-school
6	NOSKLS	Number of schools attended
7	SEPTAV	September Term Average for the child
8	P/F	Pass/Fail September Term Average (45 % = Pass)

	Sensory Variables	
9	ADISC	Auditory Discrimination Test Scores

	Motor Variables	
10	E	Eye - Right/Left
11	H	Hand - Right/Left
12	F	Foot - Right/Left
13	CDEH	Cross Dominance - Eye/Hand
14	MDHF	Mixed Dominance - Hand/Foot
15	PPH	Purdue Pegboard - Preferred Hand
16	PNPH	Purdue Pegboard - Non-preferred Hand
17	PBH	Purdue Pegboard - Both Hands

	Language Variables	
18	GRT	UCT Graded Reading Test
19	SRT	UCT Speed Reading Test
20	SPEL	UCT Graded Spelling Test

GLOSSARY OF MNEMONICS USED

	Sensorimotor Variables	
21	VMI	Beery Visual Motor Integration Test
22	DAP	Goodenough-Harris Draw-a-Person test
23	DAPMF	Draw-a-Person Male/Female Figure Drawn

	Cognitive Variables	
24	VIQ	Verbal IQ
25	PIQ	Performance IQ
26	I	Information
27	S	Similarities
28	A	Arithmetic
29	C	Comprehension
30	DS	Digit Span
31	PC	Picture Completion
32	PA	Picture Arrangement
33	BD	Block Design
34	OA	Object Assembly
35	CD	Coding
36	MZ	Mazes
37	BENVR	Benton Visual Retention
38	DFB	Digits Forward minus Digits Backwards

	Sundry Other Descriptions	
1	BMDP	A computer statistical package
2	CLUSTAN	A computer statistical package
3	ELA	Expected Level for Age
4	ESPL	Expected Sample Performance Level
5	HFD	Human Figure Drawing
6	L.P.A.D	Learning Potential Assessment Device
7	MLE	Mediated Learning Experiences
8	RAS	Reticular Activating System
9	SS	Standard Score
10	K's VCF	Kaufman's Verbal Comprehension Factor
11	K's POF	Faufman's Perseptual Organisation Factor
12	SOI	Structure of Intellect

ABSTRACT

Professional staff attached to Child Welfare in Cape Town are aware of the lack of academic attainment of a large number of children in alternative care. The current research investigated the relationship between scholastic performance and neuropsychological functioning in a sample of institutionalised children from culturally deprived families.

A multiple case study of 21 children, ranging in age from 6 to 16 years, comprising 10 girls and 11 boys attending the same primary school, provided data on neuropsychological, behavioural and family history dimensions. A multi-model assessment approach tapped diverse sources of evidence, including the following 5 parameters:

1) The Sensory Parameter: Snellen's Visual Acuity test, and either Merryweather & Steenkamp's or Wepman's Auditory Discrimination tests.
2) The Motor Parameter: Denckla's Revised Neurological Examination for Subtle Signs and the Purdue Pegboard fine motor speed and coordination tests.

3) The Language Parameter: The UCT Graded Reading, Speed Reading and Graded Spelling tests.

4) The Integrative Parameter: Visuographic functioning included the Beery Developmental Test of Visual-Motor Integration, the Goodenough-Harris Drawing Test and the WISC-R Mazes subtest. General intelligence was assessed using the Wechsler Intelligence Scale for Children - Revised. Memory function was gauged both by the Benton Visual Retention Test (multiple choice format) and the WISC-R Digit Span subtest. Concentration was examined by combining 3 WISC-R subtest measures (Arithmetic, Digit Span & Coding) to yield a "Freedom from Distractability" index.

5) The Personal Parameter: This included details of the children's heights and weights, as well as information regarding their self concepts, measured by the Attitudes Towards Self Scale, a semantic differential self-report scale, developed by Nieuwoldt & Cronje. Written responses to 2 projective techniques, which included Wish fulfillment and Incomplete sentences, provided material for content analyses that yielded insights into attitudes to a variety of topics, including school, family life, hopes and fears.

A questionnaire completed by the social worker at the home, using the case history of each child as source data, yielded contextual details regarding the reasons for each child's committal to the home, developmental milestones and health, family composition and circumstances.

Child care workers completed a questionnaire, together with children in their care, related to the children's past and current scholastic backgrounds. The same questionnaire included a list of behavioural problems. The child care worker was asked to indicate if a child exhibited any of the listed problem behaviours. Current scholastic achievement was gleaned from each child's September 1987 school report.

The results of each assessment parameter were presented separately, and cluster analysis techniques employed to integrate the diverse data sources from selected parameters. The average link hierarchical agglomerative classification method, incorporated in the CLUSTAN computer package, provided valuable process information regarding the interaction of 38 "mixed" assessment and descriptive variables. The characteristics of particular clustering configurations noted were interpreted in the light of current research findings in the field of assessment of culturally deprived children, and

yielded suggested guidelines regarding selection of future assessment batteries. Ward's hierarchical agglomerative classification method, also incorporated in the CLUSTAN package, yielded classification information regarding the children, based on the selected 38 "mixed" variables. Two groups of children were identified by this procedure; group membership being largely determined by whether or not a child is currently academically successful at school.

The block clustering of the children and behavioural problems exhibited by them (using the BMDP computer package) provided condensed information of both the prevalence of most frequently occurring problems, and the clustering of children exhibiting those problems. This accentuated the complex overlay between the cognitive / scholastic parameters, and those of personality functioning.

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1. INTRODUCTION

1.1 STATEMENT OF THE PROBLEM

Residential child care institutions have been part of our social order since the 17th century. Initially these early institutions chiefly provided custodial care, but the emphasis has recently broadened to provide a therapeutic environment for neglected and underprivileged children (Alan Clark, 1986). Research within this field has continued to focus on the disadvantages which these children suffer. Himes (1980), for example, found that when compared to normal family environments, the setting in children's homes showed less cohesion, poorer organisation, more conflict, less positive affect and less emphasis on culture, achievement and religious values.

Characteristics prevalent in institutionalised children include poor self-esteem, cognitive deficiencies and academic failure. Research conducted by Bakwin (1949), Bowlby (1951) and Goldfarb (1943) provided evidence that deprivation and institutionalisation are often associated with a lack of educational progress and problems associated with emotional and social development.

Within the South African context very little practical work has been conducted in this field. Cronjé's(1984) research highlighted the need for therapeutic programs to improve

self-esteem, cognitive skills and academic achievement of institutionalised children. Gannon (1977) and Strydom (1973) reported various practical difficulties, including a shortage of staff and lack of training, resulting in staff being unable to pay enough attention to the needs of the children in their care. Clark's (1986) research on the changing self-esteem, cognitive skills and academic achievement of pre-adolescents, in a children's home, is designed to test the effectiveness of a program which has been extensively used on children in residential institutional settings (Feuerstein, 1979; 1980;).

1.2 NEED FOR THE PRESENT STUDY

That children in institutions do not achieve academically, and exhibit varied behavioural problems which mitigate against scholastic attainment is not surprising. Difficulties relate to adequately catering for the assessment and mediation of these problem areas; both from the practical aspect of lacking the human resources to provide such services, and from the theoretical aspect of selecting appropriate psychometric tools and interpreting test data that have been developed and standardised on populations of "normal" middle class subjects. There exists a blatant need for additional knowledge related to the cognitive and behavioural characteristics of these children, before intervention programs can be designed to mediate desirable changes.

Ann Stricklin's (1972) doctoral thesis, entitled "A Psychological Study of Children Legally Removed From Parental Care", states

> "Almost daily, immediate and long-term plans and arrangements have to be made for children whose life circumstances are such that society is forced to take upon itself the awesome task of separating this child from his parents -- to intervene in this most basic of all human relationships. And yet, little is understood of these children -- their abilities, traits, strengths, weaknesses, or needs -- or their parents, or the circumstances which culminate in the need for their removal from parental care" (p.3).

Her thesis successfully attempts "to contribute to the understanding of the 'dependent and neglected' child" (p. 4). The purpose of this PRESENT study is closely aligned in both motivation and design to that of Stricklin's; however the issues addressed are dichotomised. Whilst the children retain a central role, the rationale and appropriateness of currently available and commonly applied psychometric assessment tools is also queried.

1.3 BACKGROUND TO THE PROBLEM

1.3.1 THE CHILD IN INSTITUTIONAL CARE

The Child Care Act of 1983, which came into effect on 1 February 1987, replaces The Children's Act, number 33 of 1960. The Act has only one set of regulations, applicable to all population groups, but the administration of the Act is delegated to the separate welfare departments - according to population group.

Guidelines are laid down for social workers in this Act to decide whether a specific child is "in need of care". Once a child has been found to be in need of care the social worker responsible for the case is faced with various alternatives, including removal of the child to a children's home. A child cannot be received into a children's home unless that children's home is managed by an association of at least seven people and is registered (Section 30 [1]). Children's homes registered in terms of the Children's Act (1960) are deemed to be registered in terms of the current act. The Children's Act of 1960 defines a children's home as "any residence or home maintained for the reception, protection, care and bringing-up of more than six children or pupils apart from their parents..." (p. 281).

In addition to the constitutional requirements, a children's home cannot be registered unless the Department is satisfied that proper arrangements have been made or will be made:

(a) for the treatment of the children by a social worker, medical practitioner, psychiatrist or psychologist when such treatment is necessary;

(b) for the proper feeding and care of the children;

(c) to ensure that children who are of school-going age attend school.

Whilst removal from the parental home is regarded as a positive action Strydom (1973) has reported that it is experienced by the child as a profound emotional shock. The younger the child is

at the time of the removal, the greater is the distress experienced (Heeger, 1980).

Research related to children's experiences in institutions testify to the continuation of deprivation in one form or another. Bowlby (1965) studied the effects of maternal deprivation; other studies include social deprivation as a result of a lack of acquisition of necessary social skills (Brill and Thomas, 1964); physical deprivation (Stricklin, 1972); emotional deprivation (Roberts, 1985) from poor early parent-child interactions; and cultural deprivation due to a lack of stimulation (Roberts, 1985).

Goldfarb (1943) has reported low intelligence quotients, poor concept formation and impaired speech in children reared in institutions. Both Cronjé (1984) and Van Zyl (1985) have noted that retarded intellectual development results in poor concentration and school performance. The institutionalised child's experience of school is generally negative, and it is associated with failure and inferiority (Stricklin, 1972).

Many of these deprivation experiences feed into the mechanisms that account for the chronic cognitive deficits displayed by institutionalised children. They are grouped by Feuerstein & Rand (1973) into two possible etiological clusters that affect differential cognitive development, viz.:

1) Distal etiological factors, such as: genetic factors, organicity, environmental stimuli, poverty, educational level of parents, emotional balance of child/parents and cultural differences, which are associated with cognitive development, but in a rather loose and distant way, in contrast to the second group of factors, below.
2) Proximal etiological factors, broadly referred to as "Mediated Learning Experiences" (MLE).

Feuerstein & Rand (1973) consider the occurrence of distal etiologies not isomorphic with deficient cognitive functioning; whereas a lack of MLE is regarded as necessary and sufficient to cause cognitive impairment. (Refer Figure 4.4.2 [A])

They conceive MLE as one of two interactional modalities of a growing human organism with the environment that results in cognitive development and change. The first modality comprises the direct and immediate exposure of the organism to sources of stimuli, described by the Piagetian formula:

Stimulus - (Organism) - Response (Piaget, 1966)

Piaget considered the interaction between the evolving organism and its environment to comprise the dual processes of assimilation and accommodation, which result in a constant enlargement of cognitive schema. The second modality, termed "Mediated Learning Experiences" by Feuerstein & Rand, implies "that between the various sources of stimuli, external or internal, and the developing human organism, an intentioned and

experienced individual interposes himself and mediates the stimuli impinging on him" (p. 15). Thus, whereas the human factor is conceived in the Piagetian model as an object among others in the environment, Feuerstein & Rand consider the human as a mediator of the world to the growing child, through various interactional processes, including:

* Selecting the stimuli to be processed by the organism;
* Scheduling the appearance and reinforcement levels of stimuli, which produces an orientation towards both temporal and spatial dimensions of experienced objects and events;
* Controlling the variation and intensity of stimuli, and preparing the organism for the particular stimuli to which she will be exposed;
* Purposefully manipulating stimuli, which promotes the development of comparative behaviour and thus induces relational thought processes, by assisting the child to link certain events belonging to the same class;
* Finally, through building patterns of functioning and motivation from the constant interaction between the mediator and the organism, the emergence of the need to search for meaningful links between otherwise discreet appearances of objects and events, creates the prerequisite for the concept of causality.

MLE thus provide powerful opportunities to sensitise the growing child towards stimuli impinging on her from the world, and create in her the need and the ways for their integration into a broader array of mental functions. In this way MLE reflect

"an orientation of the mediator, be it the caring mother, father or other members of the nuclear and enlarged family, be it the representatives of the institutionalized and formalized education towards structuring the future of the new generation by intervening at a very early age and in a continuous way in the course of its development" (Feuerstein & Rand, 1973, p. 17).

The authors consider MLE to be the sole ingredients which determine "differential cognitive development in otherwise similarly endowed individuals even when living under similar conditions of stimulation" (p. 18). Thus formulated MLE complement the Piagetian formula listed above, by introducing the human factor in the role of mediator. The authors suggest a new formula to incorporate this interposition of the human factor, both between the sources of stimuli and the organism, and between the organism and his repertoire of responses, thus:

Stimulus (Human) - Organism - (Human) Response.

(Model obtained from Haddasah-Wizo-Canada Research Institute, Jerusalem, at L.P.A.D. workshop, June 1987.)

An exposition of MLE, as conceived by Feuerstein & Rand, is a necessary prelude to providing a definition of the term "cultural deprivation", which occurs frequently in the body of this research. The culturally deprived individual is defined as one whose modifiability via direct exposure to stimuli is hampered, impaired and limited. The etiological reasons for this lack of flexibility are embodied in the absence of, or

limitation in exposure to MLE in early life. This results in retarded or inappropriate cognitive functioning, due to the incapacity of the individual receiving stimuli to use, to register and integrate such stimuli into a larger array of previously experienced elements (Feuerstein & Rand, 1973).

1.3.2 THE CURRENT RESEARCH CONTEXT

The professional staff attached to Child Welfare in Cape Town are aware of the lack of academic attainment of a large number of the children in alternative care. Annie Starck Village in Athlone houses 60 children in 6 cottages. Children of both sexes are admitted; the current age range being from 6 to 20 years. The focus of this study is an exploration of neuropsychological, behavioural and case history data of a sample of primary school children from Annie Starck Village. It is hoped that the body of information collected will create an opportunity to facilitate insightful understanding and management of children who present with similar profiles.

The preceding discussion has highlighted the need to assess the nature of functioning characteristic of children living in homes, before planning specific intervention programs which may be implemented to assist these children. Such an exercise, although simply one of data generation, should provide useful benchmarks that are essential to an enterprise which is

basically oriented to providing solutions to problems. The "problem" requires definition, before solutions can be proffered.

Official sanction granting permission to undertake research of this nature was obtained from the Research Committee of the South African Council for Child and Family Welfare. (Refer Appendix III, Annexure A.)

2. METHODOLOGY

2.1 RESEARCH STRATEGY

2.1.1 THE CASE STUDY METHOD

As a research endeavour the case study contributes uniquely to our knowledge of individual, organizational, social and political phenomena, "for it allows an investigation to retain the holistic and meaningful characteristics of real-life events" (Yin, 1984, p. 14).

Yin (1984) suggests 3 conditions dictate the choice of one of the five major research strategies available to the social sciences, viz:

(a) the type of research question posed;
(b) the extent of control an investigator has over actual behavioural events; and
(c) the degree of focus on contemporary as opposed to historical events.

(Refer Table 2.1.1 [I], below).

Whilst the various strategies are not mutually exclusive, in some situations a specific strategy has a distinct advantage. Yin suggests that for the case study this is when "A 'how' or 'why' question is being asked about a contemporary set of events, over which the investigator has little or no control" (Yin, 1984, p. 20).

TABLE 2.1.1 [I]

RELEVANT SITUATIONS FOR
DIFFERENT RESEARCH STRATEGIES

Strategy	Form of Research Question	Requires Control over Behavioural Events ?	Focuses on Contemporary Events ?
Experiment	How, Why ?	Yes	Yes
Survey	Who, What *, Where, How many, How much ?	No	Yes
Archival analysis	Who, What *, Where, How many, How much ?	No	Yes/No
History	How, Why ?	No	No
Case study	How, Why ?	No	Yes

* "What" questions, when asked as part of an exploratory study, pertain to all five strategies.

(Extracted from Yin, 1984, p. 17)

For the purposes of this study the following definition of the Case study strategy reflects its methodological appropriateness, given the current research context:

"A case study is an empirical enquiry that:

* investigates a contemporary phenomenon within its real-life context; when
* the boundaries between phenomenon and context are not clearly evident; and in which
* multiple sources of evidence are used."

(Yin, 1984, p. 23)

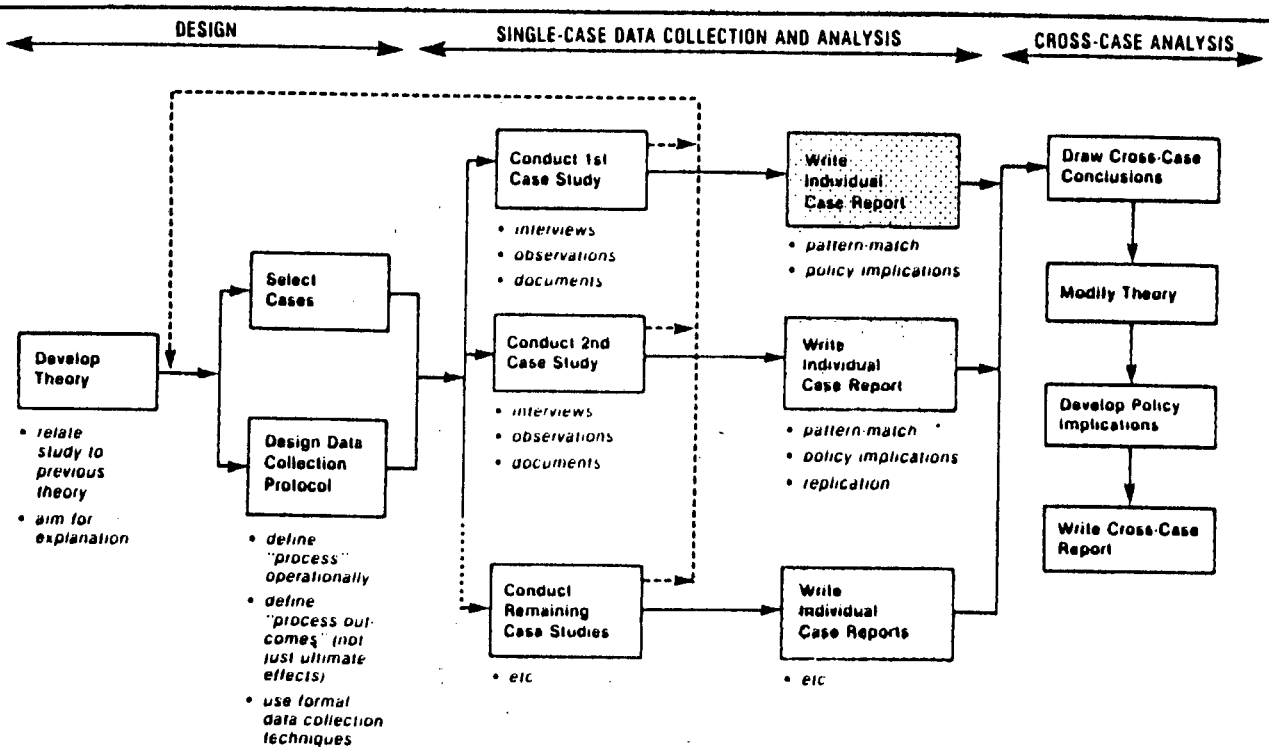


FIGURE 2.1.2 [A]

CASE STUDY METHOD (Extracted from Yin, 1984, p. 51)

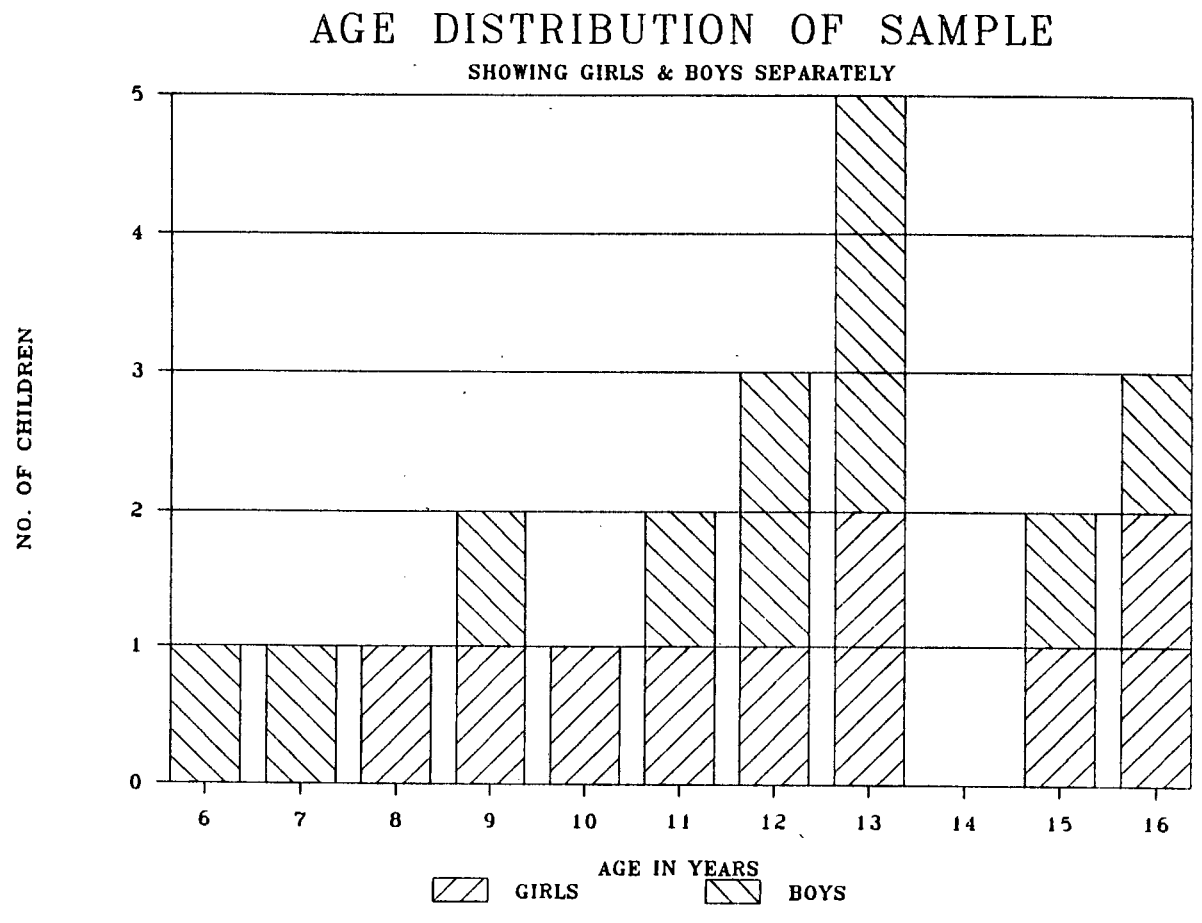


FIGURE 2.2.1 [A]

of children attending primary school from Annie Starck Village attend this school. This selected sample of 21 children, ranged in age from 6 to 16 years, and comprised 10 girls and 11 boys. Whilst all 21 children were bi-lingual, 2 of the sample came from a predominantly English speaking environment, the remainder from a predominantly Afrikaans speaking environment. In all cases assessments were conducted in the child's language of preference. Figure 2.2.1 [A] above presents a graphical breakdown of the sample, in terms of age and sex. Case numbers were allocated from the youngest to the oldest child in the sample.

2.3 PROCEDURE

2.3.1 THEORETICAL FRAMEWORK: A MULTI-MODEL ASSESSMENT APPROACH

Mercer's long-term research project (1973, 1978, 1979), stimulated by her concern for the misclassification of children from culturally and linguistically diverse backgrounds, resulted in the development of the System of Multicultural Pluralistic Assessment: SOMPA (Mercer, 1973). The aim of such an approach was to capitalise on the convergence between different philosophical viewpoints offered by different models, and thereby provide more information within a broader normative framework.

Mercer's multi-model approach has been adapted to provide a

each child. This allowed for an idiographic analysis of each child's profile, as well as a nomothetic comparison of selected group profiles. In Yin's (1984) terminology such a study is of the multiple-case, embedded design type.
(Refer TYPE 4 in Table 2.3.1 [I], below.)

TABLE 2.3.1 [I]

BASIC TYPES OF DESIGNS FOR CASE STUDIES

	Single-Case Designs	Multiple-Case Designs
Holistic (Single unit of analysis)	TYPE 1	TYPE 3
Embedded (multiple units of analysis)	TYPE 2	TYPE 4

(Extracted from Yin, 1984, p. 41).

Feuerstein et al.'s (1979, 1980) Learning Potential Assessment Device (L.P.A.D.), designed to tap areas of cognitive deficit, and the complementary remediation program, Instrumental Enrichment, provide viable intervention strategies suited to the specific needs of children from culturally disadvantaged milieus. Obstacles relating to access to Feuerstein's instruments prompted the author to resort to selecting existing psychometric tools, whilst employing the theoretical framework expounded by Feuerstein and co-workers, for interpretive purposes.

2.3.2 INPUT DATA: PSYCHOLOGICAL TESTS USED

Anastasi (1982) states that the advance selection of tests to fit the individual case puts a heavy burden on the clinician's expertise and judgement. "Moreover, independently developed tests are not likely to be comparable with regard to normative samples and score scales. Empirical data on the inter-relations of different tests are also likely to be meager" (p. 474). Aware of these very real limitations in the current research setting, the researcher attempted to assemble a battery of tests that would provide measures of significant neuropsychological skills deemed to be important contributors to scholastic achievement. The inappropriateness of certain normative data is acknowledged, and this will be considered in the discussion of results.

Rather than merely list these tests, they have been grouped according to the functions they tap. This should clarify the rationale for their inclusion as assessment tools.

2.3.2.1 THE SENSORY PARAMETER:

This might be described as the input/perceptual parameter. It is the means through which the child notices and then makes meaning of the world about him/her. For the sake of convenience it was assessed along the following two dimensions:

A) VISUAL - including the following:

i) Acuity: Far and near, by testing the subject's ability to read a series of Snellen type graded letters; firstly using a chart for far acuity; and then using a reduced Snellen chart, to assess near acuity. The intention was to detect any gross physical visual disability. Refer Appendix I, Annexures Ai & Aii for copies of the charts used.

B) AUDITORY - including the following:

i) Auditory Discrimination Test, devised by Joseph M. Wepman, to determine the child's ability to recognize the fine differences that exist between phonemes used in English speech. This measures the child's ability to hear accurately, an ability that has been found to be highly related to the development of speech accuracy and somewhat related to reading ability. The Afrikaans form of the test, developed by Merryweather & Steenkamp (1970), is not yet standardised, but was nevertheless administered, to provide a useful indicator of the same ability. A copy of the lists of words used in these tests is present in Appendix I, Annexures Bi (Afrikaans) and Bii (English).

2.3.2.2 THE MOTOR PARAMETER:

Because the motor system develops first, its role in the hierarchical structure of intelligence is an important one. Piagetian theory states that movement initiates the development of the perceptual-motor world of the child. Assessment of motor skills included:

A) A NEURODEVELOPMENTAL ASSESSMENT on the basis of the Neurological Examination for Subtle Signs (NESS), developed by Denckla & co-workers (1985). Refer Appendix I, Annexure C for a copy of the assessment schedule.

B) FINE MOTOR SPEED & CO-ORDINATION, as assessed by the Purdue Pegboard (Costa et al., 1964), used clinically as a screening device for brain damage (Fernald et al., 1966).

2.3.2.3 THE LANGUAGE PARAMETER:

This was assessed in the following manner:

A) READING - the U.C.T Graded Reading Test and its Afrikaans equivalent, the U.K. Leestoets were chosen to establish a reading age as well as the reading speed for each child. A copy of the word lists are exhibited in Appendix I, Annexures Di (Afrikaans) and Dii (English). Unfortunately no equivalent reading comprehension test exists, so this dimension was not assessed.

B) SPELLING - an adjunct to the U.C.T/ U.K graded reading test (above), the English and Afrikaans spelling tests were developed to assess the child's spelling ability. A copy of the spelling lists are attached in Appendix I, Annexures Ei (Afrikaans) and Eii (English).

Speech assessment was unfortunately excluded in this dimension, due to time constraints.

2.3.2.4 THE INTEGRATIVE PARAMETER:

This refers to the processing that occurs between the input and output phases of intelligent activity; in Logue's (1970) words "a good descriptive phrase but one which does not help us to understand what really happens in that intervening area" (p. 61). The following measures are considered to probe significant areas of integrative functioning:

A) SENSORIMOTOR INTEGRATION - as measured by 3 visuographic tests:

i) The Developmental Test of Visual-Motor Integration, developed by Keith E. Beery "to serve as a regular classroom screening instrument that helps prevent learning and behavioural disorders through early identification of difficulties" (Beery, 1982, p. 13);

ii) The Mazes subtest of the WISC-R (see below for information relating to the WISC-R);

iii) The Goodenough-Harris Drawing Test, requiring one drawing of a person (sex unspecified) of each subject, and scored in accordance with the test manual specifications for drawings as measures of intellectual maturity (Harris, 1963).

B) GENERAL INTELLIGENCE, comprising Verbal and Performance ability, as measured by the Wechsler Intelligence Scale for Children - Revised (WISC-R). Although no standardised South African version of this scale exists, the administration was in line with those standards used by Frances Hemp and associates (1984), in research investigating neuropsychological impairment in children following head injury, at Groote Schuur Hospital, Cape Town.

C) MEMORY - Visual and Auditory memory assessments were undertaken.

i) Visual memory: Visual Retention test performance, developed by Arthur Benton as a "memory for designs" test, "devised for use with adult patients as a measure of immediate memory capacity which would utilize sensorimotor components different from those of the familiar auditory-vocal digit span" (Benton & Collins, 1949, p. 610). Refer Appendix I, Annexure F for a copy of the test items comprising Form A & Form B of the

test. The researcher constructed her own test items, copying those used by Benton (1950), from which article Annexure F is extracted.

ii) Auditory memory: This test of immediate memory via the auditory route was assessed using the WISC-R Digit Span subtest.

D) CONCENTRATION - assessed by considering 3 WISC-R subtests (Arithmetic, Coding, & Digit Span), to establish an index of "Freedom from Distractibility" (Kaufman, 1975).

2.3.2.5 THE PERSONAL PARAMETER:

This parameter is a complex amalgamation of different personal dimensions, "measured" in a variety of ways, including the use of projective techniques. The aim was to capture a comprehensive picture of each child's physical dimensions, as well as his/her attitudes toward self, towards family and others.

A) PHYSICAL ATTRIBUTES - each child was weighed and measured, and these measurements plotted against norms used by the Red Cross War Memorial Children's Hospital.

B) SELF ESTEEM - as assessed by the Attitudes Toward Self Scale (ATSS); a short test, which is easy to administer, developed by Prof. J. Nieuwoudt and Dr. Elsje Cronjé (personal communication, Alan Clark). The subject rates him/herself according to ten evaluative dimensions of a semantic

differential. For a copy of this test refer Appendix I, Annexures Gi (Afrikaans) and Gii (English).

C) The Incomplete Sentence Test, developed by Grover and associates at the University of Cape Town Child Guidance Clinic is used to tap certain attitudes and perceptions regarding home and school (Stricklin, 1972). A copy of the sentence stems appears in Appendix I, Annexures Hi (Afrikaans) and Hii (English).

D) The Wish fulfillment fantasy, the child's written response to a written question asking: "If you were allowed three wishes for anything that you wanted - in the whole world - what would you wish for?". This technique was used by Stricklin (1972), in a similar research setting.

2.3.3 INPUT DATA: SCHOLASTIC HISTORY & BEHAVIOURAL PROFILES

Upon completion of the psychological assessments listed above information relating to the child's scholastic history was obtained from a questionnaire completed by child care workers, in consultation with each child.

The same questionnaire also collected information from the child care workers about behavioural difficulties exhibited by children, in their care, in the cottage environment. These "target behaviours" were selected following a review of research

in the field of child care, by the author. A copy of this questionnaire is attached (Appendix II, Annexure A).

In order to obtain information relating to the children's current performance at school, the September 1987 school reports were examined, in the presence of the Social Worker and Recreation Officer, at Annie Starck.

2.3.4 INPUT DATA: CASE HISTORIES

The case histories of the children and their families, held by the child-caring agencies, was obtained from the social worker attached to Annie Starck Village. This information was collected after the individual assessments were completed, by a questionnaire, designed for this purpose. A copy of this questionnaire is attached (Appendix II, Annexure B).

2.4 CASE STUDY PROTOCOL

Yin (1984) suggests that a case study protocol is desirable under all circumstances, but is essential if using a multiple-case design. Briefly this should include:

* overview of the project (objectives and auspices, case study issues and relevant readings to the topic under investigation).
* field procedures (credentials & access to case study sites, general sources of information and procedural reminders).

* case study questions and
* guide for the case study report (outline, format for the narrative, and specifications re any bibliographical information and other documentation).

A case study protocol per se, attending to the specific areas specified by Yin was not used in the current research project. The author's research proposal incorporated selective aspects of Yin's protocol, namely:

* the overview of the project (including objectives, documentation re permission to undertake the research and relevant readings).
* loosely formulated suggestions regarding case study questions and tentative references to design a questionnaire "to extract important historical information relating to both the child's and parents' lives" (J. Blakey, Research Proposal, submitted March 1987).
* The case study report, its outline and format, is embodied in this Masters thesis document.

The lack of a case study protocol, and apparent lack of clarity in certain areas of the research proposal (e.g. exclusion of "field procedures" section, suggested by Yin, above) focus on the pervasive dichotomy that exists between the demands of meeting academic requirements, whilst allowing for flexibility in an applied research setting that presents its own unique demands. Such flexibility allows for the existence of two separate but inter-related processes, viz the research process

itself and a complementary "learning process". The dynamic interplay between these two processes created its own momentum; the researcher and the Annie Starck Village system evolved their own collaborative learning processes; each informing and being informed by the other's perceptions of the research. This fact ultimately affects the eventual outcome, yet the intrusion of seemingly "subjective" elements in the research process allows for an acknowledgement of a more personal, informed interpretation of data generated by the endeavour. This, in the opinion of the author, is well suited to the case study approach adopted in this study.

2.5 PILOT CASE STUDY

A pilot case study was undertaken, using two subjects (one boy, aged 12 years and one girl, aged 13 years), to assess the effectiveness of the chosen neuropsychological test battery. One child was selected by the social worker as a child who experienced scholastic problems, and one who did not. These two children were assessed "blind" by the author, to determine whether the tests selected for the neuropsychological assessment battery, the test situations and the data interpretation would conform with expected objectives.

The outcome of this valuable exercise resulted in the exclusion from what was already an extensive battery of tests, of 4

related to Piagetian developmental assessment; the conservation of substance, length, area and volume. Both subjects coped extremely well with these tests, and it was decided by the author that they would not provide differential data that would contribute significantly to research objectives.

Another valuable "finding" related to the attitude of each child to the researcher. Each child had been told by the social worker that the researcher was coming to see them, to try and find out how they could be helped "to do better at school". The assessments took approximately 2 hours each; in the social worker's office, at Annie Starck Village. They were scheduled for late afternoon, when homework and other commitments were complete. The girl proved very co-operative, helping the researcher with her Afrikaans pronunciation, whilst the boy was at first very sullen. This sullenness was traced to be a result of missing a soccer practice! In a subsequent encounter with the boy his attitude had changed considerably; he referred to the researcher as "teacher", and waited to speak to her as she left the home, to ask for a birthday present. "What would you like, as a present?". Reply - "A gun".

The anecdotal nature of the above passage provides insight into two important issues. The first relates to the fact that in general the attitudes of the children to school work were negative, for a variety of reasons (these will be explored in the sections relating to the children's scholastic history and

the Personal Parameter, especially Self Esteem). The fact that the children were informed that the researcher was trying to find out how they could be helped "to do better at school" unfortunately, in some cases, linked the assessment process with existing negative attitudes about school experiences. It became crucial for the success of the research process to actively create an ambience of trust in the researcher, establish positive attitudes towards the assessment process, and thereby ensure that the child was motivated "to do his/her best". Careful consideration regarding the selection, and order of presentation of the tests aimed at minimizing such negative factors, and enhancing rapport between the researcher and the children. Certain tests were included for administration in a small group setting, first. This initial assessment was used to meet the children and facilitate the forging of a working relationship in a group setting, which would be less threatening, for younger children in particular. Once the initial group assessment was complete the individual assessments were administered.

The second issue, essentially administrative, relates to the fact that to ensure a good start to an assessment, it was important to establish a time when the child was "free" and did not resent spending time with the researcher. This goal was not always successfully achieved. The time established for assessment interviews was often beyond the control of the researcher, and dependent on the organisational abilities of the respective child care workers.

Finally, the request for a birthday present from the boy was shared with the two social workers at Annie Starck Village. They were not surprised. Their experience of institutionalised children has forged an impression that they constantly demand succour from adults; be it of a physical or an emotional nature.

2.6 DATA COLLECTION

2.6.1 FIELD PROCEDURES

In a case study type design the investigator does not control the data collection environment as one might in using other research strategies. In Yin's words it is necessary "to integrate real-world events with the needs of the data collection plan" (1984, p. 67).

The pilot case study provided valuable insights regarding certain issues related to the pragmatics of maintaining the integrity of the testing environment; both from the child's motivational point of view, and from the aspect of establishing good rapport between the tester-testee. These issues have been noted above. What remains to be covered are a description of the consultative processes established, to arrange assessment times for the children; the order and location of such assessments; and the order of presentation of tests.

2.6.2 CONSULTATIVE PROCESSES

For the pilot case study arrangements to assess the two children were made through the social worker attached to Annie Starck Village. The researcher was subsequently introduced to the child care workers of the 6 cottages, at a regular Thursday morning meeting. She described the aims of her research project, and explained the need for their support during the data collection phase. The lack of questions generated by this presentation was interpreted by the researcher as an indication of the fact that the presentation had been too academic. It was a good experience to receive feedback of this nature, and provided valuable information about a style of communication that would not facilitate dynamic exchanges within "the village". Effective communication required a practical approach; a dumping of theoretical academic jargon. The journey travelled was from a starting point of distant aloof researcher/intruder, via consultative highways and byways, to a more accessible resource position.

Initially appointments were set up through the social worker, as for the pilot study; however this proved unsatisfactory, as the social worker lived away from the home, worked a 5 day week, and so was unavailable over weekends, when the bulk of the assessments were done. An alternative system of "booking" a time to see the children was established by working directly through the child care workers resident at each cottage. This

occasions. In all cases the assessments were completed in the afternoon, following school, during the week days; or during weekends; or school holidays.

Where a child proved very unresponsive and unco-operative the researcher enlisted the help of either the social worker, with whom the children had a good relationship, or a child care worker, to explain the reasons for their need to help with the investigation.

Once all the individual assessments were complete, the scholastic history and behavioural data questionnaires were given to the child care workers by the social worker, to complete. Upon investigating the completed questionnaires the researcher realised that they contained inaccuracies. The child care workers consulted the children about how many schools they had attended, and in some cases the confused backgrounds of the children meant they were unable to reconstruct accurately events in their past. Other difficulties related to a lack of clarity in the design of the questionnaire; e.g. the unclear elicitation of responses, a misunderstanding of questions, inability to distinguish the presence of a behaviour and its presence representing a problem, and probably a varying degree of sophistication regarding completing such questionnaires. To rectify these problems, the researcher consulted the children's case histories, with the social worker, to reconstruct their school histories; and arranged interviews with the child care

workers, to discuss the children's behavioural profiles. This proved a valuable exercise, for in some cases there were discrepancies between the perceptions of two child care workers regarding a child's behaviour. In certain cottages two child care workers are responsible for the care of children in the cottage. The essence of such conflicts related to whether the presence of a specific behaviour represented a problem. The researcher accepted the opinion of the child care worker who worked more closely with the child in question, in determining which response to accept. The criterion used to establish when a behaviour represented a problem related to the consistent appearance of the specific behaviour over a period of time.

The case history questionnaires were completed by the social worker, who extracted details from the case histories of the relevant children. These were handed over to the researcher upon completion of the assessment phase of the children.

A meeting was arranged between the researcher and the recreation officer at the village, to see the children's September school reports, to extract relevant details from them, regarding the success/not of each child at school.

2.6.3 LOCATION OF ASSESSMENTS

All group assessments were completed in the dining rooms of the individual cottages, or in the recreation room ("hall") of the

"village". Individual assessments were mostly completed in the child's own room, or the child care worker's lounge, in the cottage. These venues were chosen to try and exclude external distractions, as there were numerous competitors for the child's attention, in a cottage with up to 10 resident children. In one case the child was at first reluctant to be assessed in her room, due to her lack of trust in the researcher. Her first assessment was in the cottage lounge, but subsequent meetings took place in her room.

2.6.4 TEST ADMINISTRATION

.6.4.1 GROUP SEQUENCE

Where there were only one or two children in a cottage, a group was formed with children of a similar age, from another cottage. The following tests were administered in the sequence listed below:

Goodenough-Harris Drawing Test.

Beery's Developmental Test of Visual-Motor Integration.

Attitudes Toward Self Scale.

Sentence Completion.

Wish fulfillment.

After a short break the

U.C.T/U.K. Spelling test.

The presence of "a stranger" in a cottage, working with selected children, proved a novelty for some children who were not included in the sample. In certain cases these children's curiosity resulted in investigations to establish if they would be missing out on anything. This produced a lively atmosphere; and whilst there were interruptions, the researcher did not consider that they constituted a serious breach of the standardized conditions required for a "testing environment". In point of fact, the "group testing situation" probably simulated fairly accurately the "normal" cottage environment of the children. The sacrifice of a sterile clinical setting, in favour of the cottage atmosphere was a calculated decision taken by the researcher, in anticipation that she would elicit far greater co-operation from the children, if they felt relaxed whilst completing the tests.

In addition to the above tests the children's heights and weights were recorded, after a group assessment.

2.6.4.2 INDIVIDUAL SEQUENCE

The individual sequence of tests proved more variable than the group presentation, due to the fact that the younger children required more breaks, given their shorter concentration span. In general, however, the following sequence was used as a model, and adapted where the researcher considered that an individual's motivation may be affected due to fatigue or other factors:

The Purdue Pegboard test.

Denkla's Neurological Examination for Subtle Signs.

WISC-R.

The Snellen Visual Acuity test.

Benton Visual Memory test

Auditory Discrimination test.

U.C.T/U.K Reading test.

The motor tests were purposely placed first, as most of the children enjoyed the tasks, and this created an opportunity to build good rapport between the tester and testee.

2.7 ANALYSIS OF DATA

Yin (1984) suggests that for case-study analysis one of the most desirable strategies is the use of a pattern-matching logic. Such a logic compares an empirically based pattern with a predicted one (or with several alternative predictions).

The complexities of integrating the multiple sources of evidence collected in this research, and weaving the strands into recognisable patterns has provided the researcher with a challenge. In keeping with the original objectives of the project (viz. that the researcher provide some benchmarks to assist in the delineation of the level of primarily cognitive functioning, of a sample of children from Annie Starck Village),

the methodology selected provided tools for an exploratory data analysis, which traced some of the patterns inherent in both the variables being measured, and the individual children themselves. The colour and texture of the final interpretations are provided by the valuable insights that qualitative data analysis contributes.

2.7.1 CLUSTER ANALYSIS

> "Given a number of objects or individuals, each of which is described by a set of numerical measures, devise a classification scheme for grouping the objects into a number of classes such that objects within classes are similar in some respect and unlike those from other classes." (Everitt, 1980, p. 1)

Cluster analysis is the generic term used to describe those data analysis techniques chosen to produce classifications from initially unclassified data, and thus assist in the identification of any similar patterns occurring across cases in the study.

The first stage in any cluster analysis is to convert the raw data matrix into one of inter-individual similarity, dissimilarity or distance measures. The result of such an analysis will be a number of groups, clusters, types or classes of individuals. Everitt (1980) notes that these terms can be used interchangeably, in an intuitive manner at first - the problem of defining their meaning will be discussed in the section devoted to interpretation of the cluster analysis (Refer section 4.6).

3. RESULTS: CONTEXTUAL INFORMATION

Whilst the data relating to the social histories of the children in the sample was collected after the assessments of these children, it will be presented first, as it provides essential contextual information for a full appreciation of the results.

3.1 CASE HISTORY INFORMATION:

The researcher found it necessary to organise the data obtained from the case histories of the children comprising the research sample into a variety of topics. In doing so some data has been "lost" and some "distorted" by the selection of "relevant" topics. Despite the fact that the existential impact is inevitably lost in the anonymity of a data reduction process, it is nevertheless hoped to depict some of those aspects which have vitally affected the lives of these children.

3.1.1 FAMILY MEMBERSHIP

Although the sample comprises 21 children, only 15 families are represented. Ten of these families have only 1 child each in the sample (10 children - 48%); 4 families have 2 siblings each (8 children - 38%); and 1 family has 3 siblings (14%). One of the 2-sibling families and the 3-sibling family are in fact related; the mothers of each family being sisters.

The children are members of families comprising between 1 and 8 children (mean number = 3.9).

3.1.2 REASONS FOR COMMITTAL TO ANNIE STARCK CHILDREN'S HOME

The reasons for committal to a children's home are complex to summarise, both for each case and across cases. Table 3.1.2 [I] below tabulates this data.

TABLE 3.1.2 [I]

SUMMARY OF REASONS FOR COMMITTAL TO A CHILDREN'S HOME

NO. FAMILIES	REASON
6	Mother deceased. All 6 families showed evidence of alcohol abuse; 4 families experienced foster care breakdown before being placed in the home; the other 2 families were found in need of care due to inadequate parenting by extended family/friends; in 1 of the families physical abuse of the child occurred by her reputed father.
3	Accommodation lacking; physical neglect; alcohol abuse.
2	Supervisory neglect; alcohol abuse.
1	Parents deceased; foster care breakdown. (This is the only family for which no alcohol abuse was indicated.)
1	Physical abuse & neglect; alcohol abuse.
1	Supervisory neglect; alcohol abuse; children left home for the streets & found breaking the law
1	Mother disappeared & child left with relatives; supervisory neglect; alcohol abuse.

NOTE: Physical neglect refers to the inadequate nourishment and clothing of the child. Supervisory neglect refers to the lack of control or supervision exercised by parents over their children. Physical abuse refers to physically assaulting the child.

The high incidence of substance abuse is reflected in the fact that in 14 of the 15 families alcohol abuse was indicated; whilst drug abuse occurred in 6 of the families.

3.1.3 DEVELOPMENTAL MILESTONES & HEALTH

For 10 of the 21 children in the sample normal developmental milestones were recorded. The remaining children's records did not reflect this information. Molteno's (1985) study of pre-school development in a sample of coloured children in Cape Town found that during infancy milestones corresponded to those prevailing in First World countries. However subsequently a developmental fall-off coincided with the influence of the socio-economic environment. Molteno et al. (1986) suggest that social stress, parental mismanagement, family factors, especially discord and mental illness, and other traumatic life events, all contribute to producing childhood problems.

Only 3 children showed evidence of problems with their health. One child suffers from asthma; two have problems with their eyesight, and one child has been involved in 3 vehicular accidents, with resulting injuries mainly to his feet.

3.1.4 FAMILY COMPOSITION:

This feature was approached from the point of view of establishing the identity of, and details relating to both the

The income sources for maternal employment were indicated as: Salary (1); Wage (2); Disability Grant (1); Maintenance Grant (1); "Tot" system (1).

Six of the 8 mothers maintain contact with their children; 1 occasional contact; and 1 has no contact.

The marital status of the mothers is reflected in the following data: Of the 7 deceased 4 were unknown & 3 were married at the time of their deaths. For the remaining 8 mothers: 1 is married; 1 separated; 3 are cohabiting with boyfriends; 1 has an indefinite relationship with a boyfriend; 1 has relationships with males for short periods; and 1 was unknown.

3.1.4.2 FATHER FIGURE

The "mother-parent" characteristic of family functioning for a large number of these children is clearly evident, when presented with the dearth of information regarding father figures.

Of the 15 families represented in the sample 10 families (66.6%) had no father figures present at the time of committal to Annie Starck Village, only 2 of which were due to their fathers having died. Of the 5 remaining families the father figures are the children's biological fathers: 1 father is married to the child's mother; 1 father is widowed; 1 reputed father is married to someone else; and 2 reputed fathers are the mothers'

boyfriends. All 5 father figures have occasional contact with their children.

Demographic details included the following:

Age ranges from 35 to 50 years.

Only 1 father's educational attainment was known, and is less than Std 6.

Occupational categories included Labourer (1); Hawker (1); Construction Worker (1).

Job stability indicated that for the 3 fathers whose occupations are known 2 were indicated as "Settling", 1 as "Stable".

Income sources for these 3 fathers included: Salary (1); Wage (1); Disability Grant, supplemented by hawking (1).

3.1.5 FAMILY PROBLEMS

Details of the prevalence of physical illness, scholastic, psychiatric and social problems in families relate only to those families where records exist. One child's background is a complete mystery, with no details available. In other families only certain areas were reported. The information below is therefore not complete, but reflects what was available in the case histories.

Three families recorded evidence of physical illness: In 1 the mother (now deceased) suffered from asthma; in 1 the father has an injury to his right hand; and in 1 the mother's youngest sister suffered from TB.

Of the 7 families reported on for evidence of scholastic problems 2 were stated to be "problem-free"; in 2 families the parents/mother are not educated; in 2 families there were no specific problems, but the older siblings in the family were reported as not being motivated to succeed at school; in 1 family problems were noted with a maternal aunt and uncle.

Five families (33.3%) showed evidence of psychiatric problems: In 2 families (the mothers are sisters) the mothers' brothers are violent and abusive, one being a certified Valkenberg inpatient; in 1 family the mother's uncle is a Lentegeur patient, her aunt in receipt of a disability grant (reasons unspecified); in 1 family the father is an inpatient of Valkenberg due to his disability resulting from a head injury; in 1 family the mother attended Avalon and later Valkenberg for treatment related to her alcoholism.

Social problems existing in the families related mainly to alcohol abuse. 14 of the 15 families (93.3%) are reflected in this aspect of the data, and only 1 of these 14 families was reported as having no social problems (where both parents are deceased). The remaining 13 families reflect a complex variety of problems, including: Alcohol alone (3); alcohol, violence and fire-setting by a child (1); alcohol, violence and crime (1); alcohol, violence and truancy (2); alcohol, violence, crime and truancy (1); alcohol, drugs, violence and crime (3); alcohol, drugs, violence and truancy (1); drugs, anti-social behaviour and violence (1).

3.1.6 FAMILY RELATIONS

Family relationships occurred within a context of serious social problems, referred to above. It is impossible to adequately reduce the complex descriptive information reported on family relations; instead a selection of three cases will be presented, to provide some idea of the social milieu surrounding the children, prior to their removal from their families.

1.) Case No.s 1 & 3: Parents abused alcohol together. Mother was more stable than the father, who didn't play his part adequately within the family. Mother had to fend for the family when they led a nomadic life style at one stage. Parents seemed to have a good relationship as they spent 14 years together.

2.) Case No.s 2, 5 & 7: Mother not married at the time of removal; cohabiting with the reputed father of the children. Their relationship was not good at times. They abused alcohol together, and the reputed father assaulted the mother.

3.) Case No.s 11 & 19: Mother cohabiting with reputed father of the children. Parents relationship characterised by alcohol abuse, criminality and poor limit setting.

3.1.7 ECONOMIC CIRCUMSTANCES & ACCOMODATION

Information relating to disposable income was not available for all families. Of the 7 families for whom data was known

5 survived on a total family income of less than R100 per month; and 2 on between R100 - R200 per month. The number of children dependant on this income ranged from 1 to 5 (mean = 3.6).

Accomodation data prior to removal from the family environment was available for 13 families. All the accomodation was described as "Poor". Four families lived in houses; 3 of these homes having 2-4 rooms, 1 being a one-roomed house. Three families lived in one-roomed shanties. Two families squatted in bushes or backyards. Two families lived in flats, one of which had 2-4 rooms, and the other one's dimensions were unknown. One family lived in a room on the mother's employment premises, and one family had no fixed abode, leading a nomadic existence.

The information above provides adequate evidence of children born into, and raised, in exceptionally deprived and depriving environments. The impact of such deprivation is explored in the following section.

3.2 CORRELATION OF VARIABLES: DESCRIPTIVE LANDSCAPE

In correlational research no direct causal connection can be inferred. None the less, it can yield interesting and theoretically useful findings in circumstances where experimental manipulations are impossible.

Miller (1984) states that although the correlation coefficient is thought of as a descriptive statistic, it is possible to calculate its significance by finding the probability of obtaining a random sample from the same population with an "r" value as high as the one obtained. If this probability is 0.05 or less, the correlation is significant. The critical values of the product-moment coefficient for a sample size of 21, for a two-tailed test are:

Significance level:	.10	.05	.02	.01
Correlation value:	.369	.433	.503	.549

(Extracted from Table XI, Miller, 1984, p. 182.)

These values have been used to select significant correlational measures in this research. .433 served as the "cut-off" for statistical significance at the .025 level (a one-tailed test).

To avoid ambiguity, the following descriptive convention has been applied to all significant correlation coefficients:

All .433 > r < .6 are referred to as low;

All .599 > r < .8 as moderate;

All .799 > r < 1 are considered high.

Essentially a correlation coefficient expresses the degree of correspondence, or relationship between 2 sets of scores. As a prelude to further investigation of the results certain characteristics of the sample are described, in terms of correlations between selected variables used in the analysis, but not comprising assessment parameters. These variables

sketch characteristic features of the sample, which appear prominently and consistently throughout the study and represent factors of either historical or current significance. Such an enterprise assists in "setting the scene", before the action starts!

Those variables selected for descriptive purposes are listed below, with a shortened mnemonic in brackets adjacent to each one, to be used as a reference label in future discussions.

TABLE 3.2 [I]

SELECTED DESCRIPTIVE VARIABLES

AGE	Age
AGEADM	Age admitted to Annie Starck Village
YRSASV	Years resident at Annie Starck Village
YRSPSK	No. of years at pre-school
NOSKLS	No. of schools attended since starting primary school
SEPTAV	September term average
P/F	Pass/Fail the September term average

The break down of the sample by age and sex was presented in Figure 2.2.1 [A], above. The mean age on admittance to Annie Starck Village of those children 13 years and older (10 children) was 11.0 years; for those younger than 13 years (11 children), 6.9 years.

The moderate correlation between AGE & AGEADM (r = .7974) reflects the fact that younger children in the sample were admitted to Annie Starck Village at a younger age; older children at an older age. AGE is also linked, although less

strongly, to NOSKLS (r = .4998); whilst AGEADM shows evidence of a higher correlation with NOSKLS (r = .7682). This association, quantified also by the negative relationship between YRSASV & NOSKLS (r = -.4720), indicates that once removed from a turbulent home environment, where some children attended as many as 4 different primary schools, Child Welfare social workers attempt to ensure stability and continuity of scholastic experiences through attendance at <u>one</u> of the local primary schools in the community.

Other AGE related correlations are those with SEPTAV (r = -.8066) and P/F (r = -.6907). These negative coefficients stress the fact that the older children are those who are failing to achieve at school. Furthermore, those admitted at an older age are faring badly at school, as evidenced by the correlation between AGEADM & SEPTAV (r = -.5298) and AGEADM & P/F (r = -.5993). The similarly negative association between AGE and YRSPK (r = -.6507) relates the fact that the older children have not attended pre-school; conversely, the younger children have.

It is interesting in focusing on the variable YRSPSK to note all significant correlations (> +/- 4.33). These are listed below:

-.6924	AGEADM
-.5868	NOSKLS
.5553	WISC-R Blocks subtest
.5443	UCT Spelling Test
.5295	Benton Visual Retention Test
.5280	SEPTAV
.4902	WISC-R Performance IQ scores

The negative relationships between YRSPSK and both AGEADM & NOSKLS demonstrates the fact that only those children admitted at a young age attended pre-school (19% of the sample); older children in the sample, who remained in the community during their pre-school years, did not attend one, and attended a greater number of primary schools. This highlights the importance attached to pre-school education by the administrators at Annie Starck, who ensure that children of pre-school age in their care attend one.

The ensemble of 5 remaining variables in the list ALL reflect a visual processing component. Although derived from an extremely small sample size, the evidence singles out visual processing skills as a field requiring further examination, and stresses the value of pre-school experiences in the development of these skills, thereby exposing the dual needs:

a) to create an awareness within the community of the contribution provided by pre-school education;

b) to cater for an anticipated increase in the demand for pre-school education by provision of more facilities.

4. RESULTS & DISCUSSION: ASSESSMENT PARAMETERS

The framework used to list the tests in the previous section will serve for the presentation of results. This format should lend a degree of cohesiveness to an enterprise that could be mistaken for one of random data generation. The rationale for each test selected was stated in the previous section; this section includes the presentation and interpretation of the results.

4.1 THE SENSORY PARAMETER

4.1.1 VISUAL ACUITY

Visual acuity can be estimated clinically with a fair degree of accuracy by testing the individual's ability to read a series of letters, of graded sizes, "with strokes and intervals constructed to subtend from the observer an angle of 1 minute and standard multiples of this, the whole letter subtending 5 minutes (and its multiples)" (Roper, 1974, p. 166). The visual acuity derived in this way for each eye, is recorded as a fraction of unity (the latter being represented by those letters whose limbs each subtend 1 minute). Thus the largest letter on the chart, subtending 10 minutes per limb and 50 minutes in all, can just be discerned by a patient with acuity of 0.1. In the British Isles this percentage is recorded as a fraction of the normal testing distance of 6 metres; therefore unity corresponds

to 6/6, and the largest letter to 6/60. (Refer Appendix I Annexure A.) The normal person has a visual acuity which is rather better than unity, but the diameter of the foveal cone precludes any acuity greater than 6/3. When the vision is so poor that even the largest letter - 6/60 - cannot be discerned, it is measured clinically by reducing the numerator of the fraction, rather than further increasing the denominator; thus half of 6/60 vision is recorded when the top letter can only be read at a distance of 3m. (Roper, 1974).

The Snellen chart used for examination was scaled down from the normal 6 metre distance for use at a distance of 3 metres.

It is also necessary to check visual acuity at reading range (near vision). Snellen's reading test-types were used, graded on the same principles as the standard distance test-types, but reduced to one-seventeenth of their normal size, so that at 35 cm distance the "Snellen equivalent" can be recorded (Roper, 1974).

The distance/far visual acuity for 20 of the 21 children was normal, for both the right (R) and the left (L) eyes. The girl whose visual acuity was not normal, experienced problems with the (L) eye only. Her (L) eye recorded 6/9; an 8.6% loss in visual efficiency.

Near visual acuity presented variable results. Two girls recorded 6/9 for both (R) and (L) eyes. This represents a visual efficiency loss of 8.6% for each eye. These girls were unable to identify any of the letters in the normal (6/6) range. One of these girls is the same child who experienced difficulties with the far visual assessment. She wears lenses already (and was tested wearing them); thus drawing attention to the need for child care workers to ensure that regular eye examinations are made. Further, one boy had difficulty identifying all the letters with both the (R) and (L) eyes, in the normal (6/6) range; one girl and one boy recorded similarly for the (R) eye only, and another girl for the (L) eye only. To summarise these results:

TABLE 4.1.1 [I]

FAR VISUAL ACUITY RESULTS

100 % VISUAL EFFICIENCY		91.4 % VISUAL EFFICIENCY	
(R)	(L)	(R)	(L)
100% of sample	95.2% of sample	-	4.8% of sample

NEAR VISUAL ACUITY RESULTS

100 % VISUAL EFFICIENCY		91.4 % VISUAL EFFICIENCY	
(R)	(L)	(R)	(L)
90.5% of sample	90.5% of sample	9.5% of sample	9.5% of sample

(See over page for derivation of visual efficiency %)

NOTE: % Visual Efficiency is derived from the following figures, obtained from a registered optometrist:

SNELLEN EQUIVALENT	VIS. EFFIC.	VIS. LOSS
6 / 6	100.0 %	0 %
6 / 9	91.4 %	8.6 %
6 / 12	83.6 %	16.4 %

The warning on the reverse of the distance chart that "the test type is in no way intended to be a substitute for a full eye examination" reflects the fact that these assessments were used to screen any gross physical visual disability.

Within the classroom context good visual acuity, both far (for blackboard work) and near (reading and writing) is a vital ingredient for successful scholastic performance. Richard Apell, in an article entitled "Children's Visual Behaviour" (Undated pamphlet, issued by the Optometric Extension Program Foundation) notes that something has already happened to the child, before he shows a loss of visual acuity; in other words that there is nothing preventive in the use of the Snellen Acuity Chart. It is effective only after the disorder has occurred. He also notes that the Snellen test "makes no investigation of the child's aligning-eyes ability nor of the thirty or more other visual skills important to learning through vision". Those visual abilities which are learned and trainable include:

* tracking (the ability to follow a moving object smoothly and accurately with both eyes);
* fixation (the ability to quickly and accurately zero-in on a series of stationary objects one after another, such as moving from word to word while reading);

* change focus (the ability to look from near to far, and vice versa, without momentary blur e.g. from a book to the blackboard);
* depth perception (the ability to judge relative distances of objects and to see and move accurately in three-dimensional space);
* peripheral vision (the ability to monitor objects in side vision while attending to a specific task);
* binocularity (the ability to use both eyes together equally and simultaneously);
* maintaining attention (the ability to sustain any particular visual skill without interfering with the performance of other skills).

At birth a child has "sight" in that her/his eyes are attracted to a bright spot. "Vision", the interpretation of that bright spot, comes only by learning, for whilst the child is born with the necessary visual machinery, he/she must learn to use it. Vision is one of the major contacts with reality in the early experiences of the child, and for the "normal" child a major portion of what she/he learns comes through the sense of sight.

An investigation of the learnt visual functions listed above, whilst important, are beyond the scope of this study, and warrant a specific project in themselves. The variable nature of the near-vision results obtained adds weight to the evidence suggesting that nature designed the human eye for distance seeing. Today's culture brings with it more and more "near visual" tasks, and developmental opportunities have not evolved satisfactorily to meet the new demands made of the human visual machinery by these tasks. The result is a stress on the eyes; a fact that requires careful management if care-takers and teachers wish to avoid children developing into retarded readers or non-achievers.

4.1.2 AUDITORY DISCRIMINATION

So much of the child's behavior in school is organized around verbal signals, and yet auditory functions are often overlooked. The recognition and discrimination of sound patterns may also be subject to impairment.

Deutsch (1968) pointed out that for the development of satisfactory auditory recognition and discrimination another set of variables, related to exposure to essential stimuli, is as vital as intactness of the brain. She quotes animal experiments on the reticular system, in which it was discovered that the signal-to-noise ratio is influential in the stimulus perceived and the response evoked. The higher the ratio, i.e. the greater the amount of "signal" versus the "noise", the more likely will be the accurate perception of the signal. Logue (1970) focuses on the relevance of these findings for the child from the poor, impoverished environment, whose optimal time for learning auditory discrimination during the pre-school years generally involves a very noisy environment, with many distractors and a low signal-to-noise ratio. The stimulus properties of such an environment encourage the child to become inattentive to the appropriate stimuli and, in some cases, to block many of them altogether.

4.1.2.1 MERRYWEATHER & STEENKAMP AND WEPMAN'S TESTS OF AUDITORY DISCRIMINATION

INTRODUCTION: DESCRIPTION OF THE TEST

The "Wepman Test", developed by Joseph Wepman, is an easy to administer method of determining a child's ability to recognize fine differences that exist between phonemes used in English speech. Merryweather & Steenkamp (1970) developed an equivalent test in Afrikaans, and state that although this test is not yet standardized it can provide a useful aide in the detection and remediation of scholastic and speech problems. They recommend the use of a tentative scale, similar to the Wepman scale, for interpretation of results.

The task presented to the child is a simple one. It measures only the ability to hear accurately. The child is asked to listen carefully to the examiner read pairs of words, and to communicate either affirmatively or negatively whether the words read were the same (a single word repeated) or different (two different words). The Wepman list comprised 40 pairs of English words; the Merryweather & Steenkamp 60 pairs of Afrikaans words. If, due to inattention, the child requests a repetition of the word pair, this is not allowed.

The test has been found useful in selecting children, especially those in the early elementary school years, who are slower than

their peers in developing auditory discrimination. This ability has been found to be highly related to the development of speech accuracy, and somewhat related to reading ability. Because the factor of auditory discrimination is developmental, error scores mean different things at different ages. Whilst both the English and Afrikaans scoring scales have an upper age limit of 8 years and older, the test was included because of the fact that for older children it has been found useful in the differential diagnosis of reading and speech difficulties.

AUDITORY DISCRIMINATION TEST RESULTS

Of the entire sample 3 children were tested using the Wepman list (i.e. in English); the remainder using the Afrikaans list of Merryweather & Steenkamp (M & S). To cater for a finer discrimination of the older children comprising this sample the researcher extrapolated the upper age ceilings of both test scales to include a greater age range. The adjusted scales are depicted in Table 4.1.2 [I] below.

Figure 4.1.2 [A] below provides an indication of each child's deviation from the appropriate age level norm (indicated by individual Case No.s), as per the scales depicted in Table 4.1.2 [I] below.

AUDITORY DISCRIMINATION SCORES:

DEVIATION FROM THE RELEVANT AGE NORM

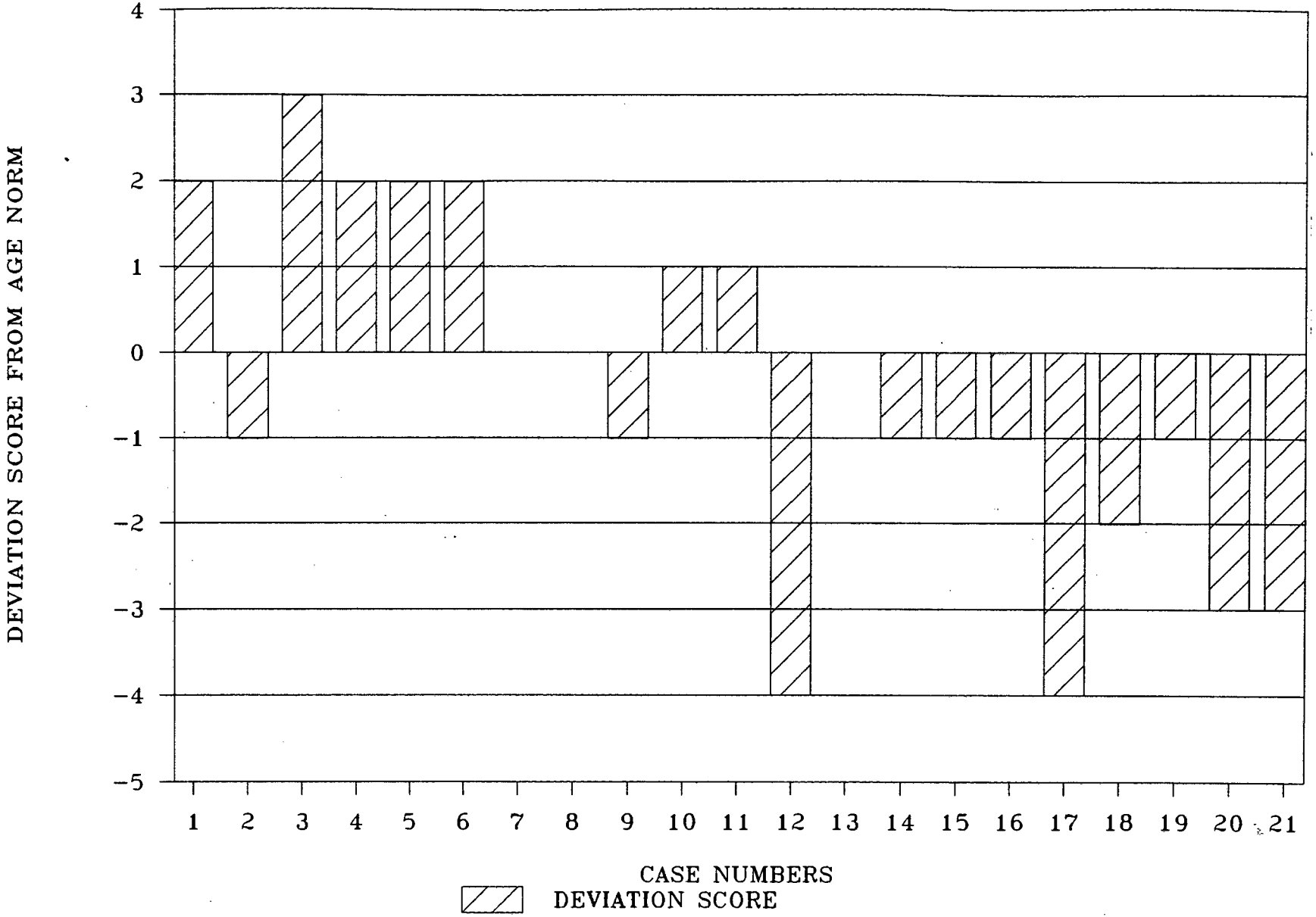


FIGURE 4.1.2 [A]

TABLE 4.1.2 [I]

EXTRAPOLATION OF AUDITORY DISCRIMINATION TEST SCALES

AGE	WEPMAN SCALE	M & S SCALE
5	6	8
6	5	7
7	4	6
8	3	5
(Extrapolation starts here)		
9	2	4
10	1	3
11	0	2
12	0	1
13 & >	0	0

(Note that the scale number of errors reflects the anticipated normal performance for a child of the given age. The discrepancy between the Wepman and M & S scales probably reflects the fact that the English list comprises 40 word pairs, the Afrikaans list 60.)

The outstanding feature of these results is the fact that whilst only 18% (2 out of 11) of the younger children score below their appropriate age norm level, 90% (9 out of 10) of the older children were recorded as scoring below the appropriate normative level. These results are in keeping with others recorded in this project, in terms of a marked discrepancy in developed abilities between the younger and older children, captured by a wide range of performance tests, and possibly reflects the significant contribution of "inattentiveness" to the older children's performances.

Wepman discriminates between 2 types of errors that a child can make in the test, viz.:

X. Where an item is different, but the child indicates it is the same.
Y. Where an item is the same, but the child indicates it is different.

Error scores for each child reflected the sum of both types of errors. An analysis of these errors is tabulated in Table 4.1.2 [II], below. The word pairs record a range of phoneme differences at the beginning, in the middle, and at the end of each word pair. The Afrikaans "X Type errors" comprised 12 from the beginning, 11 from the middle, and 12 from the end of the word pairs. It is highly probable that motivational and attention factors influence a child's performance on this task.

TABLE 4.1.2 [II]

AUDITORY DISCRIMINATION ERROR SCORES

I X TYPE ERRORS - ITEMS DIFFERENT, BUT INDICATED THE SAME

A M & S (Afrikaans) LIST

Item No.	Frequency	Word Pair
46	8	hooi - gooi
33	5	te - tik
40	4	deur - duur
35	3	soe - soet
6	2	erg - erf
23	2	bas - baas
37	2	bos - pos
53	2	trap - krap
1	1	glips - gips
8	1	haal - haar
14	1	spruit - spuit
19	1	klap - knap
36	1	swel - spel
39	1	klink - klim
60	1	jag - jig

B WEPMAN (English) LIST

Item No.	Frequency	Word Pair
2	1	cad - cab
3	1	led - lad

TABLE 4.1.2 [II] (Continued)

AUDITORY DISCRIMINATION ERROR SCORES

II Y TYPE ERRORS - ITEMS THE SAME, BUT INDICATED DIFFERENT

A M & S (Afrikaans) LIST

Item No.	Frequency	Word Pair
3	2	draad - draad
7	2	leeu - leeu
55	2	speel - speel

B WEPMAN (English) LIST (No errors recorded)

INTER-CORRELATIONAL DATA

The correlation between the Auditory Disrimination scores (ADISC) and AGE (r = .4488) reflects the differences in performance of the younger and older children, already noted. Only two other correlations are worthy of mention; those with the WISC-R Coding subtest (CD: r = .5957) and with the WISC-R Arithmetic subtest (A: r = .3643). The latter correlation fails to achieve statistical significance, but is noted as it is considerably higher than all the others, and provides an interesting perspective to the discussion, when linked with the Coding subtest. At first glance these correlations might appear incongruous, but viewed within an information processing framework that conceptualises cognition in terms of the Input, Elaborational and Output Levels, a degree of clarity emerges. Table 4.1.2 [III] below assists with this process.

TABLE 4.1.2 [III]

COMPARISON OF ADISC, CD & A TASKS

LEVELS OF THE MENTAL ACT

Test	Input Level	Elaboration Level	Output Level
ADISC	Auditory	Comparison	Vocal
CD	Visual	Comparison	Grapho-motor
A	Auditory	Computation	Vocal

The similarities between the ADISC & CD tasks become clear; they both require comparison processes at the Elaboration Level, albeit "within" different sensory modes. Identical Input and Output Level requirements probably account for the shared variance between ADISC & A. The WISC-R Coding subtest assesses psychomotor speed and "attention", and is closely related to specific learning disability in children (often in combination with low Arithmetic scores). The "attention" factor is present in both the ADISC and A scores as well, and probably provides the common thread within this complex interweaving of associations.

The term "attention" is conventionally applied rather loosely; its meaning being rather vague. It is, in the opinion of the researcher, a complex assemblage of numerous attributes; the relative degree of attentiveness relating to the degree of attention afforded each of the component attributes applicable in a given task. Within the parameters of the current research, which employs an information processing paradigm of mental activity that conceives of any mental act in terms of input, processing / elaboration and output phases, inattention may

occur in any of the component cognitive functions comprising the input and / or output phases specific to a particular task. Concentration, by contrast, shows a greater preponderance of attributes at the processing / elaborational phase of the mental act. This approach is used to assist the location of specific areas of inattentiveness and lack of concentration.

4.2 THE MOTOR PARAMETER:

Obrzut (1981) states that the school psychologist should acquire a knowledge of developmental stages of learning acquisition. Neuropsychologically, learning can be seen to comprise a hierarchy of information processing that incorporates sensation, perception, memory, symbolisation and conceptualisation (Johnson & Myklebust, 1967); and a break-down at any level of this hierarchy could result in school-related learning problems. Obrzut places sensation at the lowest level of the hierarchy, for it refers only to the activation of sensory neurostructures. Perception, the organization and integration of visual, auditory, tactile and kinaesthetic sensory input occurs at the next level, and establishes the foundation for yet another level, memory; i.e. the recall of sensations already perceived. Symbolisation is identified at the subsequent level; an inclusive concept encompassing both verbal and non-verbal types of learning and recall, which produce or represent the temporal integration of a variety of experiences. Obrzut places conceptualisation, the ability to form abstract concepts and to categorize, at the top of the hierarchy (p. 248).

Given the broad outline of developmental stages above, it is obvious that to provide an accurate reflection of mental performance all aspects of cerebral functioning need to be tapped, including sensory-motor, language and cognitive skills.

Research indicates that the developmental interaction between "pure" motor functioning and mental processing has yet to be clarified. Wolff et al. (1985) offer some reasons for the fact that correlational studies on elementary schoolchildren using motor measures as the independent variable, have generally concluded that motor performance is a poor predictor of reading achievement, academic performance or other intellectual functions (Chissom, 1971; Symmes & Rapoport, 1972; Rarick, 1980). They suggest that most of these studies have used measures which are either confounded by non-motoric variables of memory, perception, visuo-motor integration or cross-modal transfer; or those not sensitive to developmental changes over short-term intervals. Their investigation of 100 normal kindergarten and first-grade children show that the joint effect of 5 neuro-motor measures accounted for a substantial percentage of variance in reading achievement and language performance 12 months later. The authors concluded that these preliminary results indicate that individual motor signs may serve as a "point of departure for focused investigations on the enduring and theoretically important question of how the development of motor co-ordination interacts with the acquisition of 'higher cortical' functions" (Wolff et al., 1985, p. 353).

Whilst the children comprising this sample are not comparable to the "normal" children in Wolff et al.'s study, due to the effects of socio-cultural and economic deprivation, the researcher nevertheless considered neuro-motor variables would

provide additional information that could yield valuable insights related to the childrens' functioning. Thus a motor assessment was included, comprising aspects of Denckla's (1985) Revised Neurological Examination for Soft Signs (NESS), and the Purdue Pegboard's assessment of motor speed and co-ordination.

Wolff et al. (1985) draw attention to the differences between a child's calendar (or chronological) age, and his biological (or neurodevelopmental) age. They suggest that neuro-motor status appears to be a useful independent measure of developmental age for psychological investigation, especially when dissociations between them may have important consequences for academic achievement, self-esteem and social adaptation. Golden (1981) refers to these dissociations as "developmental lags", and states that since development is sequential, as the individual progresses from one stage to another there are qualitative as well as quantitative changes in the neurological base of abilities. He adds that the more advanced neuropsychologically a child is, the more advantages she will enjoy, both at school and in personal situations; yet he warns that whilst the concept of developmental lag has a role in neuropsychology, the present use of the term is highly questionable from a theoretical point of view, since there appears to be lack of clarity regarding the definition of the term.

Given the theoretically contentious nature of this aspect of the research an examination of the results assumes a degree of circumspection.

4.2.1 DENCKLA'S REVISED NEUROLOGICAL EXAMINATION FOR SUBTLE SIGNS (NESS)

The manual and scoring instructions for this test were obtained from the Psychopharmacology Bulletin (1985). A description of the 21 items comprising the test, which took about 20 minutes to administer, is provided in Appendix I Annexure C. The researcher experienced some problems in interpreting the scoring criteria for this test, due to the imprecise references to items for inclusion in scoring categories. The low ceiling (10 years) for the normative data related to the timed repetitive and sequenced movements also prevented the interpretation of this aspect of the scores. Despite these difficulties the data collected for this test was analysed to provide a diagnostic impression, but was not included in the cluster analysis.

The following scoring categories were included:

TABLE 4.2.1 [I]

DENCKLA'S NESS SCORING CATEGORIES

TOTAL1: Gait and Balance Error Score comprised the cumulative number of steps incorrectly performed on heel-walk, toe-walk, everted-walk, tandem forward and tandem backward, plus sub-optimal category performance on the balance and hopping items (Items 4, 5, 6, 7, 8, 13 & 14).

TOTAL2: Quality of Rapid Movement "Dysrhythmia" Score comprised the cumulative occurrences of dysrhythmia noted during the timed repetitive and sequenced limb movements (Items 15, 16, 17, 18, 19 & 20).

TOTAL3: Impersistence Score which related to the inability to sustain certain voluntary acts, notably the "sustenation", "finger-to-nose" and "tongue protrusion" activities (Items 9, 10, 11 & 12).

TABLE 4.2.1 [I] (Continued)

DENCKLA'S NESS SCORING CATEGORIES

TOTAL4: Mirror Movements with Timed Repetitive Movements which reflected a summation of the occurrence of any mirror movements in the contra-lateral hand/foot (Items 15, 17 & 19).

TOTAL5: Mirror Movements with Timed Sequenced Movements which reflected a summation of the occurrence of any mirror movements in the contra-lateral hand/foot (Items 16, 18 & 20).

TOTAL6: "Overflow: In-Excess-For-Age" Total Score indicated the presence of age-inappropriate mirror movements in the timed repetitive and sequenced limb movements as well as evidence of jaw movements in the "tongue wiggle" (Items 15, 16, 17, 18, 19, 20 & 21).

The "Feet-to-Hands" overflow for gaits score was not included, as all the children except one recorded incidences of using their arms to balance themselves. The results thus did not adequately discriminate between groups of children.

DENCKLA'S NESS: RESULTS

Selz and Reitans' (1979) classification of children according to taxamonic rules which include normative data, patterns of relationships, right-left differences and pathognomic signs, provides a statistical model incorporating 4 methods of inference. Obrzut (1981) suggests that this maximises the use of the information inherent in neuropsychological test results. Unfortunately since normative data was unavailable this approach could not be pursued. The level of analysis focused on the sample profile of the cumulative scores for all six totals mentioned above, which suggests certain acceptable levels of

DENCKLA'S NESS PERFORMANCE PROFILES:

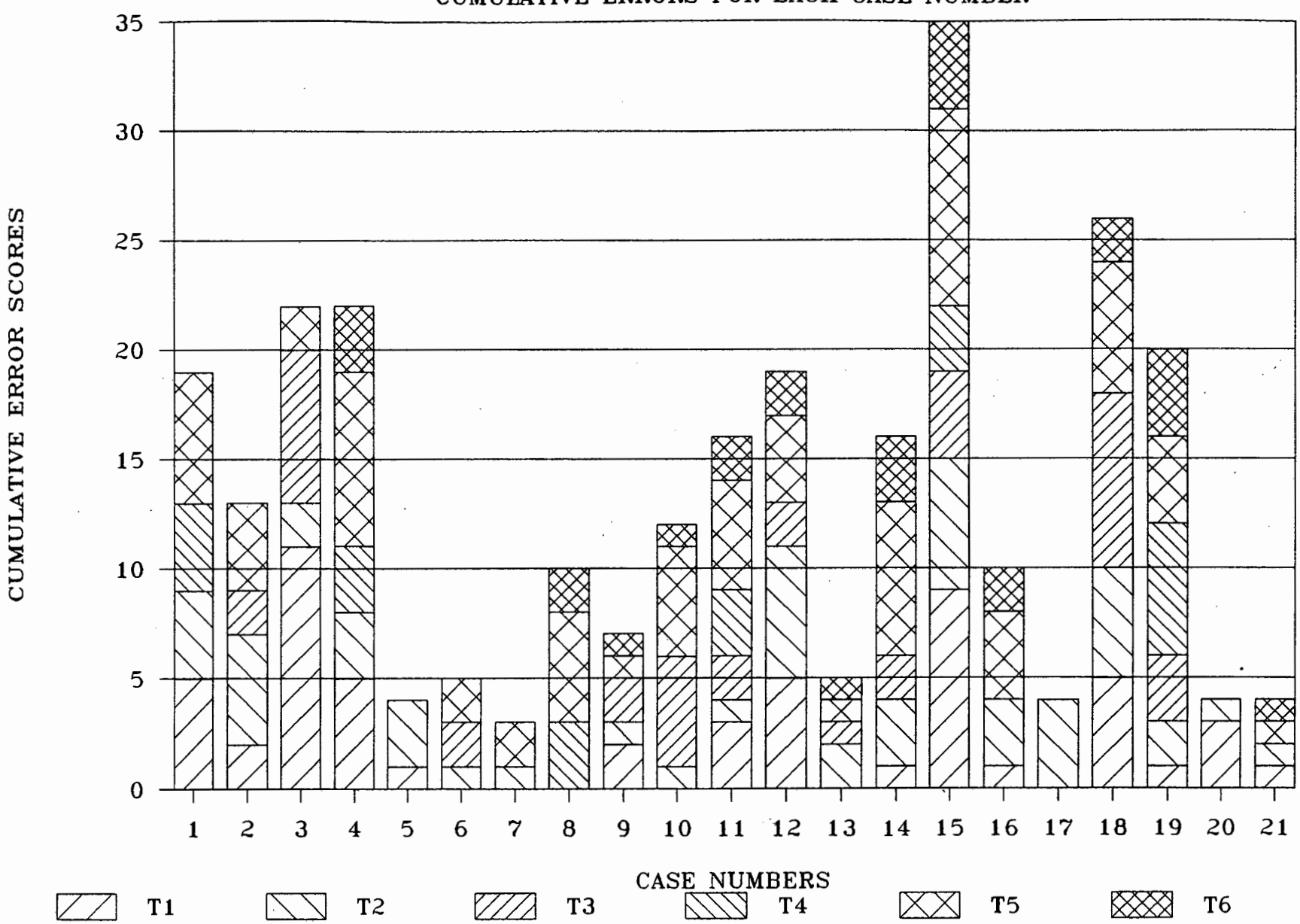


FIGURE 4.2.1 [A]

performance, relative to the sample data. Whilst right-left asymmetry was not explored in depth, mention will be made of this feature. The results are depicted graphically in Figure 4.2.1 [A], above. (Note: TOTALS 1 - 6, depicting Denckla's NESS scoring categories, are abbreviated to T1, T2 .. T6 in the legend for the stacked bar chart used in Figure 4.2.1 [A].)

The stacked bar chart in Figure 4.2.1 [A], above, provides a visual display of the cumulative error scores for each child. Four cases (19.1%) recorded cumulative scores greater than 20 (Case No.s 3, 4, 15 & 18). It is interesting to note that Case No.s 15 & 18 are both children who have a history of scholastic failure.

Of the 7 cases (Case No.s 1, 2, 10, 11, 12, 14, & 19) scoring in the band between 11 to 20 inclusive cumulative error scores, Case No.s 10, 11 & 19 failed their September term average, whilst Case No. 12 recorded an unexplained exceptionally low WISC-R Coding subtest score, and came very close to failing the September term average. The inclusion of the 4 youngest children (Case No.s 1, 2, 3 & 4) in the group scoring above 10 errors suggests that this approach may require some refinement to establish baseline cut-offs that reflect age-appropriate criteria. Alternatively, linking these children with older children who are currently experiencing scholastic problems could well serve as warning signs that predict possible future

scholastic failure, due to the presence of "developmental lags". No conclusive interpretations can be made until further research is undertaken in this area. What is clear is that 71.4% of those children who failed their September term average show evidence of neurological implications, as detected by their performance on Denckla's NESS.

Ten cases (47.6%) are represented in the lowest cumulative scores group (10 & below). Case No.s 20 & 21 are both children who have histories of scholastic failure, yet have no suggestion of neurological "dysfunction". Gaddes (1981) states that the location of neurologically normal underachievers is important, for they can be treated by standard behaviour management procedures which reinforce the child's motivation to learn.

The high incidence of neurological "dysfunction" in the group of children who failed their September term average has already been mentioned. A consideration of the children's performance patterns on the UCT Reading & Spelling Tests in conjunction with Denckla's NESS scores, yielded variable results. This suggests that whilst information gleaned from Denckla's NESS is not sufficient to indicate which children are at risk of experiencing problems with reading and spelling, it certainly is a useful adjunct when providing diagnostic information related to formulating remedial programs for those children experiencing a broad range of scholastic problems.

The presence of mirror movements "in-excess-for-age" for the timed limb movements was noted in 13 children (62%). The fact that the timed repetitive movements account for 21.4% of these scores, whereas the timed sequential movements account for 78.6% indicates the greater sensitivity of the sequential movements measure. A lacunae exists regarding research related to the incidence of age inappropriate mirror movements, so that no comparative comments can be made.

It is interesting to note that all the 8 children (38%) who recorded more than one asymmetrical incidence of mirror movements for the timed limb movements, also recorded cumulative NESS scores greater than 10 (5 of them 20 & above). Three children showed evidence of occurrence on the right side; 1 on the left side; and 4 children recorded asymmetrical overflow, but to the same extent on each side.

Whilst questions related to right/left lateral dominance were not explored data collected yielded the following information:

TABLE 4.2.1 [II]

SUMMARY OF SENSORY/MOTORIC LATERALISATION

	LEFT DOMINANT	RIGHT DOMINANT
EYE	33.3%	66.7%
HAND	9.5%	90.5%
FOOT	23.8%	76.2%

(NOTE: % indicates % of entire sample)

TABLE 4.2.1 [II] (Continued)

SUMMARY OF SENSORY/MOTORIC LATERALISATION

CROSS DOMINANCE: 28.6% dominance of LEFT EYE & RIGHT HAND
(Eye & Hand) 4.8% dominance of RIGHT EYE & LEFT HAND

"PURE" DOMINANCE: 61.8% dominance of RIGHT EYE & HAND
(Eye & Hand) 4.8% dominance of LEFT EYE & HAND

MIXED DOMINANCE: 14.3% dominance of RIGHT HAND & LEFT FOOT
(Hand & Foot)

"PURE" DOMINANCE: 76.2% dominance of RIGHT HAND & FOOT
(Hand & Foot) 9.5% dominance of LEFT HAND & FOOT

NO. OF CHILDREN	DOMINANT: EYE	HAND	FOOT
10	R	R	R
6	L	R	R
3	R	R	L
1	R	L	L
1	L	L	L

DISCUSSION

Information about cerebral dominance indicates which cerebral hemispheres subserve specific and differential functions. Kinsbourne & Hiscock (1981) state that the traditional concepts of hemispheric equipotentiality and progressive lateralization have been discredited by a rapidly expanding body of experimental evidence, which indicates that brain function is lateralized from birth, if not earlier, and that any relationship between lateralization and learning disabilities cannot be due to a simple delay in the lateralization process. They suggest, instead, that any anomalous cerebral organisation

existing in learning-disabled children is present at a very early age, and persists into adulthood.

Wolff et al. (1985) report that mirror movements accounted for a significant percentage of unique variance in reading achievement, verbal memory and automatized naming speed among young normal children. Denckla & Rudel (1978) found them to be the best predictor of 'hyperactivity' in older boys with learning disabilities; and Woods & Eby (1980) reported that they are associated with aggressive behaviour in psychiatrically disturbed aggressive children. Whilst the neural basis for the suppression of mirror movements in normal subjects remains for the most part unknown, Wolff et al. (1985) suggest that evidence of mirror movements may reflect underlying neural processes that are more generally involved in the suppression of unintended verbal and other behavioural responses, as well as selective attention. They suggest that selective attention, in turn, may be the necessary, but not sufficient, precondition for early stages of learning (to read, in particular). The high incidence in this sample of mirror movements "in-excess-for-age" has already been mentioned. Although the data analysis provides no direct support for the hypothesis linking mirror movements to selective attention, the researcher's personal observations would support further research in this area.

Wolff et al. (1985) also link speed and rhythmicity of timed motor manoeuvers with serial order control, which they speculate

may be a surface manifestation of a generic mechanism contributing to speech fluency and the temporal organisation of expressive language (MacNeilage, 1970; Wolff et al., 1984). Whilst no comment can be made on the timed aspect of the data (due to lack of normative tables), the author does nevertheless consider that the presence of dysrhythmia noted in all but one child in the sample, is worth mentioning. Six children recorded a score of 4 or more for TOTAL2 (Quality of Rapid Movement "Dysrhythmia" score), only one of whom did not score above 10 for the cumulative score. It is interesting to note the relative contributions of various items to the cumulative TOTAL2 score (55), for the sample:

Item 16: 40.0% (Heel toe tap)
Item 20: 31.0% (Successive finger taps)
Item 18: 12.7% (Hand pronation / supination)
Item 15: 10.9% (Foot tapping)
Item 19: 5.4% (Finger tapping)

Joynt et al. (1962) state that motor impersistence denotes the inability of some brain damaged individuals to sustain voluntary acts. They suggest that the phenomenon is perhaps best classified as still another example of the oscillations in level of functioning frequency shown by patients with cerebral disease, expressed in diverse forms such as short attention span, emotional lability and fluctuating sensory threshholds. Twelve children (57%) recorded scores on this measure, 5 of them recording scores between 3 & 8. All 5 children also recorded scores greater than 10 for the cumulative Denckla NESS scores.

Unfortunately many of the observations above are not able to be interpreted within an existing body of research, due to the relatively unexplored nature of this field. They are nevertheless proffered in the hope that others interested in the field may glean some insights regarding possible future avenues for investigation.

4.2.2 THE PURDUE PEGBOARD

The Purdue Pegboard Test is a measure of speed and accuracy in eye-hand co-ordination, which is useful in detecting a lateralised disability. The child is required to pick up (one at a time) and place as many metal pegs as possible, into rows of matching holes in a board, during a 30 second timed period; first with the preferred hand (PH), then the non-preferred hand (NPH), and finally with both hands together (BH).

Obrzut (1981) suggests that one-sided slowing suggests a lateralised disability on the contralateral hemisphere; bilateral slowing evidence of more diffuse or bilateral damage. The rationale for inclusion of this test in the assessment battery echoes that for Denckla's NESS, viz. to provide sensory motor input which could provide additional clues to assist in the interpretation of each child's mental functioning. In addition this test has normative data (Gardner & Broman, 1979), which allows for a normative interpretation not available for Denckla's NESS.

PURDUE PEGBOARD: RESULTS

The results of the test for the preferred, non-preferred and both hands, are depicted in Figure 4.2.2 [A], above. To correct for age differences in achievement each child's raw score is expressed as a percentage of his expected score for his age. Thus 100 % indicates he is performing at his expected level for his age (ELA); > 100 % indicates performance above, & < 100 % performance below his ELA.

Eight children (38.1%) performed below the ELA for at least one part of the test. Their performance patterns were as follows:

TABLE 4.2.2 [I]

PURDUE PEGBOARD: CHILDREN PERFORMING BELOW THE ELA

NO. CHILDREN	CASE NO.s	PERFORMANCE BELOW ELA FOR: PH	NPH	BH
4 (19%)	1 6 15 18	X	X	X
1 (4.8%)	3		X	X
2 (9.5%)	10 19			X
1 (4.8%)	11		X	

There is a high correspondence between cases noted for below age expectancy levels of performance on the Purdue Pegboard Test, and the occurrence of high cumulative error scores for the Denckla NESS. Case No. 6 is the only child who did not record above 10 cumulative errors on Denckla's NESS. The Purdue Pegboard scores yield 63.6% of cases noted as showing a high

4.3 THE LANGUAGE PARAMETER:

The "language" parameter assessed relates specifically to reading and spelling performance. This is an extremely edited view of the children's language ability, with the exclusion of reading comprehension, and the areas of receptive, expressive and pragmatic speech assessments. Reading and spelling abilities were selected primarily due to the nature of the research, viz. the emphasis on scholastic achievement. It is unnecessary to explore further the rationale linking these essential ingredients to later success/failure at school.

The UCT Scholastic Achievement Tests of Reading and Spelling, developed by Grover et al., at the University of Cape Town Child Guidance Clinic (Stricklin, 1972), were selected for inclusion in the battery. These tests are a variation of a graded reading, a reading speed and a spelling test produced in Britain. The original standardisation was completed in the late 1940's (information obtained from the Athlone School Clinic, Cape Town, handout on the test normative data). In 1985 seven schools were selected in collaboration with the Senior Psychologists at Wynberg and Bellville regional offices of the Department of Education and Culture, to provide normative data for the development of standardised tables, for Afrikaans and English speaking children attending so-called 'Coloured' schools. The schools were chosen so as to be representative of Department of Education and Culture schools in the greater Cape

Town area, in terms of social class of the pupils, the size of the school and range of ability. Apart from the derivation of new norms, a test-retest reliability check, conducted on approximately one-third of the original sample over a 6-week time lapse, demonstrated that each of the 3 tests are reasonably consistent over time.

4.3.1 READING ASSESSMENT

From a neurological viewpoint reading aloud is one of the most demanding activities that a human brain can tackle, due to the requirements of coordinated effort from the Input, Elaborational and Output levels of the mental processes. The diagnosis of a reading difficulty thus requires the careful collection of multiple sources of evidence, followed by a sifting process that discards irrelevant factors on logical grounds, before selecting those contributing to poor performance. Logue (1970) illustrates the complex nature of reading assessment, when he states that "there is no clear-cut line between the formal testing of reading and the diagnostic processes that follow" (p. 105). Each child presents a unique profile, and in grouping "categories" of children together, valuable process information is lost. For the purposes of this research, it remains necessary to adopt a normative approach, although an attempt will be made to include certain ideographic insights.

Ellis (1984) argues that the sheer existence of so many forms of

acquired and developmental dyslexia, with such varied characteristics "provides strong support for the notion that the cognitive abilities of normal people are made possible by the concerted and orchestrated activity of many cognitive subcomponents or modules which nevertheless remain separate and dissociable" (p. 45). The theoretical framework Ellis developed to explain how single word comprehension and naming occurs is complex; but so, he admits, is reading! Since the interpretation of the reading assessments requires a theoretical framework, Ellis' (1984) model will be employed, for it has evolved within an information processing analogy of cognitive processing, and provides a complementary approach within the specialised field of reading, to the more generally applicable cognitive theory expounded by Feuerstein et al. (1979), employed for interpretive purposes.

As Ellis' (1984) model is used simply for interpretive purposes, only those aspects relevant to the data presentation will be considered; however, for completeness, a visual "flow diagram" of the model is included, to identify important components. The diagram (refer Figure 4.3.1 [A], below), whilst providing the structural aspects of cognitive architecture which Ellis identified as important in the reading process, also needs an account of the processes which occur. Reference to these processes will be made, where necessary, in the section dealing with presentation of results.

The inter-correlational data will be considered following the presentation of all three language test results, due to the intricate intertwining of elements from each test.

4.3.1.1 THE UCT GRADED READING TEST (GRT)

The first step in the investigation of reading ability is the application of a test of word recognition. Process details lost in the tabulated summaries of results are important here, and include the following vital areas:

* The child's attitude when confronted with the printed word.
* How the child looks at the sheet in front of her.
* Is there a tendency to skip lines, repeat lines, or use the finger to point whilst reading?
* Is there a tendency to miss out words in a line, due either to lapses in concentration, or restricted motivational factors which cause him to give up when confronted with a difficult word?
* Does she balk only when confronted with words that require analysis and resynthesis of component parts?
* Is there a tendency to reverse words, or to start at the end of the word first?
* Is there a tendency to reverse and rotate the b-d combination?
  (Logue, 1970, p. 105)

Since the nature of this study is broader than a detailed analysis of reading skills, process information was not accounted for in a detailed manner. An analysis of errors of those children who achieved below the normative mean does however include answers to some of the questions above.

It is interesting to note that of those tests comprising the test battery only the UCT Reading and Spelling Tests have normative data derived from a population sample similar to that of the children comprising this sample. This fact accounts for the better relative standing of the children's performances. It also provides more accurate diagnostic evidence of those children whose performances fall well below age-group expectations.

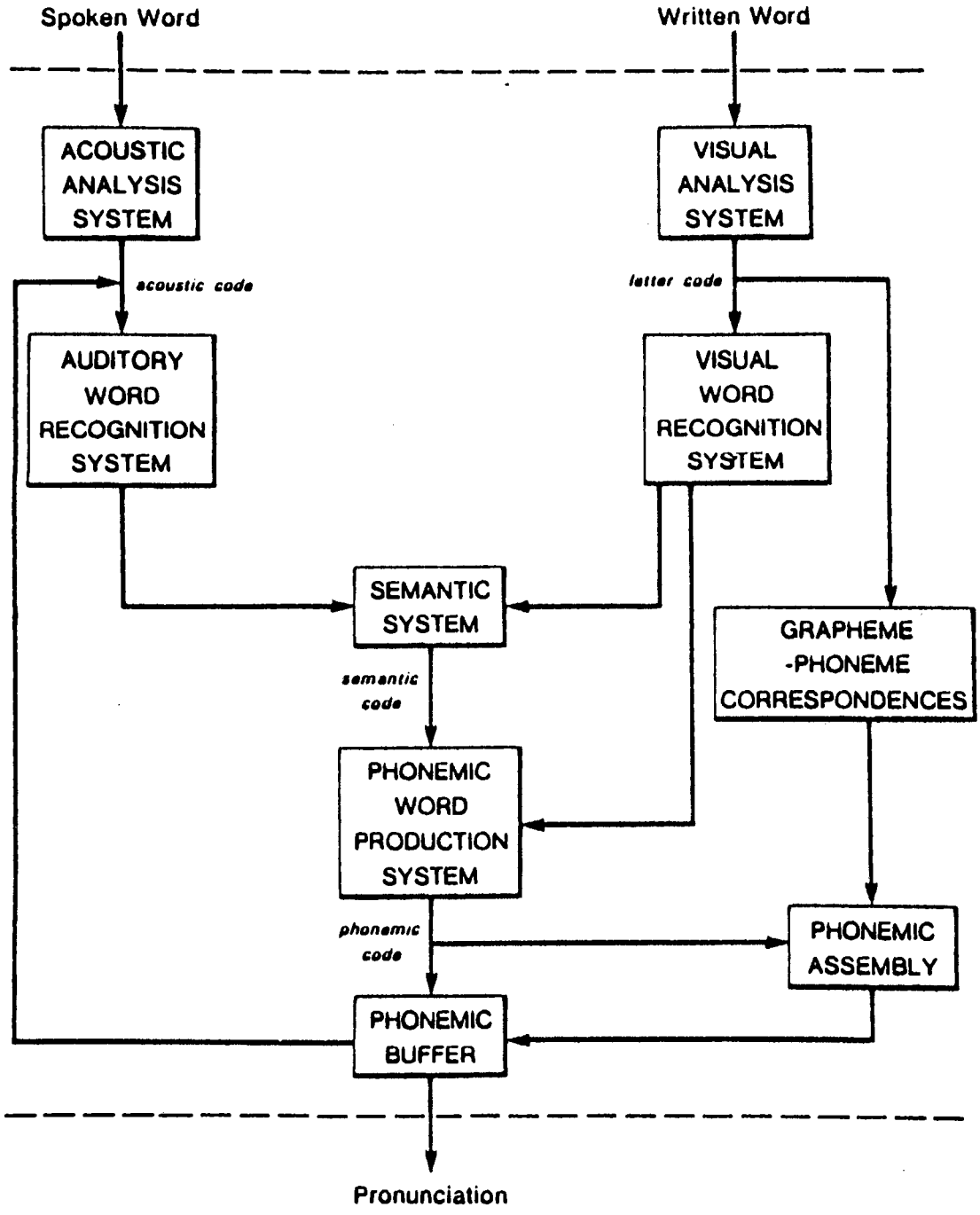
Two children in the sample came from predominantly English speaking environments, and were tested using the English lists.

INTRODUCTION: DESCRIPTION OF THE TEST

Both the Afrikaans and the English lists comprise 110 words, grouped together in coupled lines with 5 words per line. Each child was taped, whilst reading, and the assessment made from the taped recording. Time was devoted at the beginning of each assessment session to ensure that the child did not feel self-conscious being recorded, whilst reading.

THE UCT GRADED READING TEST RESULTS

The raw scores were transformed via computation of equivalent z-scores ([X-X]/SD), to a standard score format similar to the WISC-R SS, with a mean of 10 and standard deviation of 3 ([Zx3]+10). This allowed for comparisons across tests.



A MODEL FOR BOTH THE DIRECT & THE PHONICALLY MEDIATED RECOGNITION, COMPREHENSION & NAMING OF WRITTEN WORDS.

(Extracted from Ellis, 1984, p. 33)

FIGURE 4.3.1 [A]

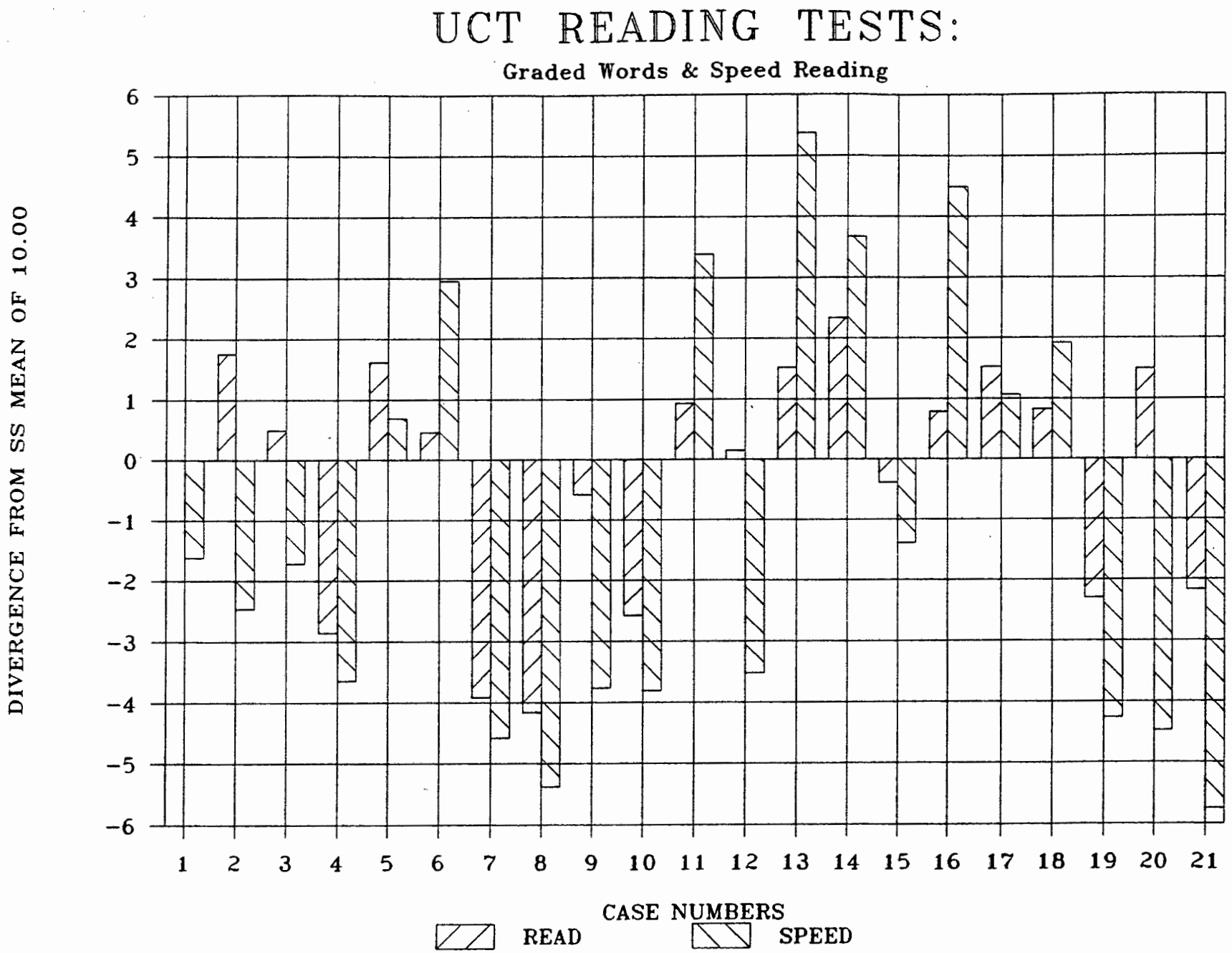

UCT READING TESTS:
Graded Words & Speed Reading
DIVERGENCE FROM SS MEAN OF 10.00
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
CASE NUMBERS
READ
SPEED

FIGURE 4.3.1 [B]

Figure 4.3.1 [B], above, presents an analysis of the deviations from the expected mean of 10.0 for each case, for both graded reading and speed reading scores. A significant feature of these results is the noticeably poorer performance of the younger group of children, in comparison with the older group. This reverses the trends observed in most other test results. These differences are summarised in Table 4.3.1 [I], below.

TABLE 4.3.1 [I]

ANALYSIS OF UCT GRADED READING TEST RESULTS

GROUP DESCRIPTION	NO. OF CHILDREN	% SCORING ABOVE MEAN	% SCORING BELOW MEAN
Entire Sample	21	61.9	38.1
Children < 13 years Children > 12 years	11 10	54.5 62.5	45.5 37.5
Children Below Mean	8		100.0
Children < 13 years Children > 12 years	5 3		62.5 37.5

Learning to read requires the integration of new skills specific to processing written language with existing skills already developed for the comprehension and production of speech. In order to understand the nature of retarded reading performance in children it is necessary to establish a developmental model that outlines the acquisition of reading skills. Marsh, Friedman, Welch and Desberg (1981) have outlined such a model, that posits 4 stages:

In Stage One ("Glance-and-guess") words are identified as wholes through the acquisition of visual word recognition units; the child lacks phonic skills.

Stage Two ("Sophisticated guessing") is similar to the preceding stage in that recognition is primarily visual, but guesses come to be drawn from within the set of words the child has encountered before, and bear an increasing visual resemblance to the target.

Stage Three ("Simple grapheme-phoneme correspondence acquisition") children begin to decode a new word, and acquire simple letter-to-sound correspondences.

In Stage Four ("The skilled reader") the use of phonics becomes more advanced and may incorporate the use of analogies as well as correspondences.

Ellis (1984) states that reséarchers have identified one of the strategies employed in the early stages of reading as that of "visual approximation"; i.e. looking for visual overlap between a new letter string and the requirements of an existing visual word recognition unit already stored in memory. Children whose cognitive functioning is characterized by either blurred and sweeping perception and/or a lack of, or deficient need for precision and accuracy in data gathering, would tend to produce variable results, if using a visual approximation strategy. To the extent that this strategy persists in a child's repertoire, in combination with the particular two deficient cognitive functions identified by Feuerstein et al. (1979) - refer

section 4.4.2, the reading performance of the child will be characterised by a large number of consistently inconsistent inaccuracies.

An analysis of the reading errors of those children who achieved below the mean provided ample evidence of "visual approximation" strategies, combined with poor decoding abilities. Examples of these types of errors can be seen in the one English-speaking child in this group (Case No. 8; Age 11 yrs 8 mths; GRT SS = 5.84; providing an equivalent reading age of approximately 8 yrs 9 mths) and included the following (incorrect pronunciation is reflected by phonetic spelling of words):
convince instead of commenced; sirs instead of serious; hamidity instead of humanity; future instead of fatigue; autobution instead of autobiography; expected instead of exorbitant; termination instead of terminology.

Poor phonic ability was also evident, in the following examples of errors:
fleenge instead of fringe; lungeoon instead of luncheon; norishment instead of nourishment; motonless instead of motionless.

An analysis of all the types of reading errors for each child who achieved below the equivalent age norm is difficult to organise, due to the different developmental levels of the children (age range of 9 years 2 months to 16 years 10 months),

and thus the different numbers of words read. Of the 8 children whose performances were below the normative average 7 performed similarly on both the speed reading & spelling tests, displaying a general deficit in the language assessments in this battery. Of these 7 children reference has already been made to the one English speaking child; the remaining 6 were Afrikaans speaking. To capture the essence of the general level of reading skills possessed by these children the researcher chose 3 children (one from the "younger", one from the "middle" and one from the "older" age groups) to present as single case studies.

1. CHILD 1: Case No. 7; Boy; Age 11yrs 7 mths; GRT SS = 6.08; Age equivalent = approx. 9 yrs.

   Testing this child proved to be very difficult. He was sullen, uncooperative and mumbled that he didn't like reading, at the beginning of the session. His negative attitude was evident in his reading, which was slow and laborious, even at the beginning, with the easy words. When he encountered longer words that required phonetic decoding, he sat and looked at them in silence; and despite encouragement made very few attempts to analyse the word into component sounds. His "stop-go" stumbling over the words hinted at the difficulties he was experiencing in being asked to perform a task he disliked, and at which he felt incompetent. Due to the tedious rate of progress the test was stopped after the first 50 words had been attempted. In the speed reading test the subject pronounced

3 words incorrectly of the 38 he read. It is obvious that test scores were attenuated by negative motivational factors. What is important is that child care workers interacting with such children should endeavour to encourage them to discover that their encounters with print can in fact be enjoyable.

2. CHILD 2: Case No. 10; Boy; Age 12 yrs 10 mths; GRT SS = 7.43; Age equivalent = approx. 9yrs 3 mths.
This child also stated at the outset that he hates reading, but nevertheless engaged the test material more enthusiastically than CHILD 1, above. Those errors present among the shorter and easier words at the beginning of the list indicated a lack of the need for precision and accuracy in either data gathering or communicating the results, as in the following examples:
se instead of sê; skryf instead of skrik; kruier instead of kuier.
This tendency was also evident when the end of the words were chopped off, as in:
hemel instead of hemele; seker instead of sekere.
Multisyllabic words present a real challenge to children who have rarely encountered them before. Those who are competent phonic decoders are able to prove relatively successful, but the high incidence of unusual phonic combinations calls for more than phonic skills to score well. It is the alternate routes through either the

semantic or phonemic code systems (refer Ellis' model, Figure 4.3.1 [A] above) that produce the interesting selection of errors in children who, due to environmental circumstances, have not been exposed to a wide variety of language experiences. The "visual approximation" strategy in consort with inaccurate data gathering / communicating processes are probably the chief culprits in producing the wide variety of errors displayed by those children in the sample whose reading levels are retarded. Examples of errors produced by this disastrous combination are: onderlike instead of onredelik; producteur instead of prokureur; oorwinning instead of oorweging; begeerting instead of begerige; kwerting instead of kwoteer; natuurlik instead of naturel; angiveidaris instead of argivaris; pandok instead of parodiek; bedanklasie instead of deklarasie; verondering instead of verordeninge; indeeling instead of ideëel; karikateer instead of karikatuur.
(In cases where "nonwords" were pronounced the researcher has attempted to capture the phonetic pronunciations of the child.)
The child did not finish the list, omitting the last 20 words. Prior to stopping he indicated he didn't know (and didn't wish to attempt) 7 of the 90 words he read. Inaccurate processing strategies resulted in 8 words incorrectly pronounced of the 52 read, in the speed reading test.

3. CHILD 3: Case No. 19; Boy; Age 16 yrs 1 mth; GRT SS = 7.71; Age equivalent = approx. 11 yrs. 3 mths.

This child's errors provide ample evidence of the natural evolution of those cognitive deficiencies operating in the previous 2 children, when mediational assistance is not forthcoming. Examples relate to:

i) Adding a phonic at the end of a word: wesentjiese instead of wesentjie; vergesels instead of vergesel.

ii) Omitting word endings: seker instead of sekere; nederig instead of nederige; geleder instead of geledere; verordening instead of verordeninge.

iii) Omitting phonics: berotting instead of begroting; wemlewend instead of wemelende; depramentel instead of departementele.

iv) Inaccurate phonic decoding: supissu instead of suspisieus; induling instead of indiwidueel; isolasism instead of isolasionisme; kofiesent instead of koëffisiënt; palogie instead of paleontologie.

v) Blatantly incorrect visual approximations: moordenaar instead of monargie; sikontraalis instead of psigoanalise.

The fact that the need for precision and accuracy in data gathering is poorly developed results in an undeveloped critical faculty which would normally mediate and guide the selective activities that reading unfamiliar words requires. The child attempted to read all 110 words in the GRT list.

Of the 78 words completed in the speed reading test 6 were incorrectly pronounced.

4.3.1.2 THE UCT SPEED READING TEST (SRT)

INTRODUCTION: DESCRIPTION OF THE TEST

This test comprises 200 two- and three-letter words, printed in 20 x 10 word lines. The words are spaced in an orderly fashion. The child was asked to read each consecutive word along each consecutive row, as quickly as possible. It was explained that the researcher wished to see how fast he/she could read; that she/he should begin when told to, and continue until told to (following an elapsed time of 60 seconds). The child was also told before hand that should any words be too difficult to pronounce, he/she should omit them. This test was always administered after the graded reading test, and the child's reading was taped in all cases, barring one boy who was extremely uncooperative. He had said that he disliked reading at the beginning of the session, and the researcher decided that taping his performance contributed to his negative feelings about reading. In calculating the raw score, those words that were incorrectly pronounced, or left out, were subtracted from the total number of words completed.

THE UCT SPEED READING TEST RESULTS

The raw scores were transformed in a similar manner to those of the GRT above. Figure 4.3.1 [B] above presents an analysis of the deviations from the expected mean of 10.0 for each case, for

both GRT & SRT SSs. A significant feature of these results is the noticeably poorer performance of the younger group of children, in comparison with the older group. This is similar to the trends observed in the GRT.

The following table summarises the performances of the 13 children who achieved below the mean on the SRT, on all 3 UCT test assessments:

	BELOW AVERAGE PERFORMANCE ON:		
NO. CHILDREN	GRT	SRT	SPEL
7 (53.8%)	X	X	X
1 (7.7%)	X	X	
3 (23.1%)		X	X
2 (15.4%)		X	

The two children whose only below average performance was on the SRT are among the youngest in the sample, and would undoubtedly improve if encouraged to read more frequently to child care workers or older children. Table 4.3.1 [II] below, provides a summary of the results and reflects the poorer performance of the younger children in the sample, already noted in the GRT.

The researcher noted the number of lines that a child skipped whilst reading during this test (denoted by the mnemonic LLO). Reading efficiently, at speed, requires moving both eyes together from the end of one line at the right hand side of the page, to the following line, at the left hand side of the page.

TABLE 4.3.1 [II]

ANALYSIS OF UCT SPEED READING TEST RESULTS

GROUP DESCRIPTION	NO. OF CHILDREN	% SCORING ABOVE MEAN	% SCORING BELOW MEAN
Entire Sample	21	38.1	61.9
Children < 13 years Children > 12 years	11 10	27.3 50.0	72.7 50.0
Children Below Mean	13		100.0
Children < 13 years Children > 12 years	8 5		61.5 38.5

When the child omits lines it is an indication that his visual tracking ability is not efficient. Nine children (42.9%) skipped out a line on one or two occasions. Those children who skipped lines, but did not record Speed Reading Test scores below the mean, showed evidence of an inability to consciously check themselves, whilst enthusiastically engaging in the task. This tendency to be impulsive is borne out by the significant correlation between the WISC-R Mazes subtest and LLO ($r = .4768$). Glasser and Zimmerman (1967) state that a good score on the WISC-R Mazes subtest reflects planning ability and delay of impulsive action. Only 3 (33.3%) of those children who skipped a line(s) performed <u>below</u> average on the Speed Reading Test; 2 of these 3 performing poorly on all three UCT tests. Only one child repeated a line that she had already read. Some

children used their fingers to assist their visual tracking, during the task.

Those children who performed below average on the GRT obtained a greater number of incorrectly pronounced words on the SRT.

4.3.2 UCT GRADED SPELLING TEST

INTRODUCTION: DESCRIPTION OF THE TEST

This test comprises a list of 100 English or 110 Afrikaans words, ranging from easy to progressively more difficult. Each word was pronounced separately, and repeated if necessary. There is no time limit. The test was administered in groups according to age ranges. The younger children were in smaller groups, due to their greater time demands and their tendency to verbalise the sounds as they attempted to spell them. The raw score reflected the number of correct spellings.

UCT GRADED SPELLING TEST RESULTS

The results of each child's performance on this test, relative to the mean of 10.0, are reflected in Figure 4.3.2 [A], below. A summary of these scores appears in Table 4.3.2 [I], below. Whilst the ratio of younger to older children comprising those children who achieved below the average is 50:50, the younger

children have comparatively more children performing above the mean, than the older group. This is the only test of the UCT language assessment tests where this ratio has been inverted, and may link the relatively better performance of the younger children on the visuographic tests with what is essentially a language test that incorporates visuographic content.

TABLE 4.3.2 [I]

ANALYSIS OF UCT GRADED SPELLING TEST RESULTS

GROUP DESCRIPTION	NO. OF CHILDREN	% SCORING ABOVE MEAN	% SCORING BELOW MEAN
Entire Sample	21	42.9	57.1
Children < 13 years Children > 12 years	11 10	45.5 40.0	54.5 60.0
Children Below Mean	12		100.0
Children < 13 years Children > 12 years	6 6		50.0 50.0

Those 7 cases that demonstrated below average performance on all 3 UCT tests were selected for an analysis of spelling errors. Provision of a "typical low functioning group" profile of spelling errors is virtually impossible, due to the complications of accounting for unique spelling strategies, as well as the developmental stages of different children, given the age range of 9 to 16 years.

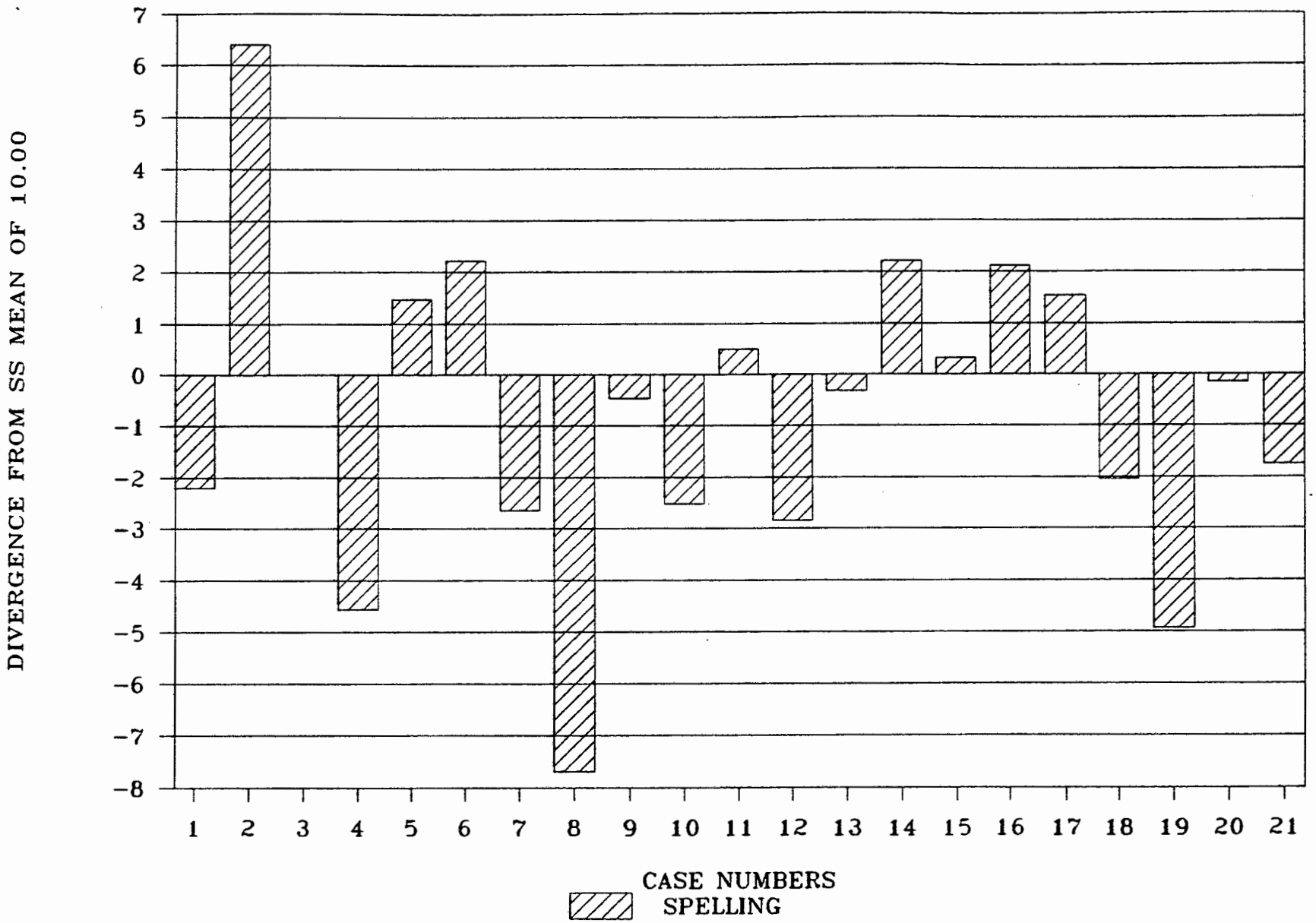

UCT SPELLING TEST:
DIVERGENCE FROM SS MEAN OF 10.00
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
CASE NUMBERS
SPELLING

FIGURE 4.3.2 [A]

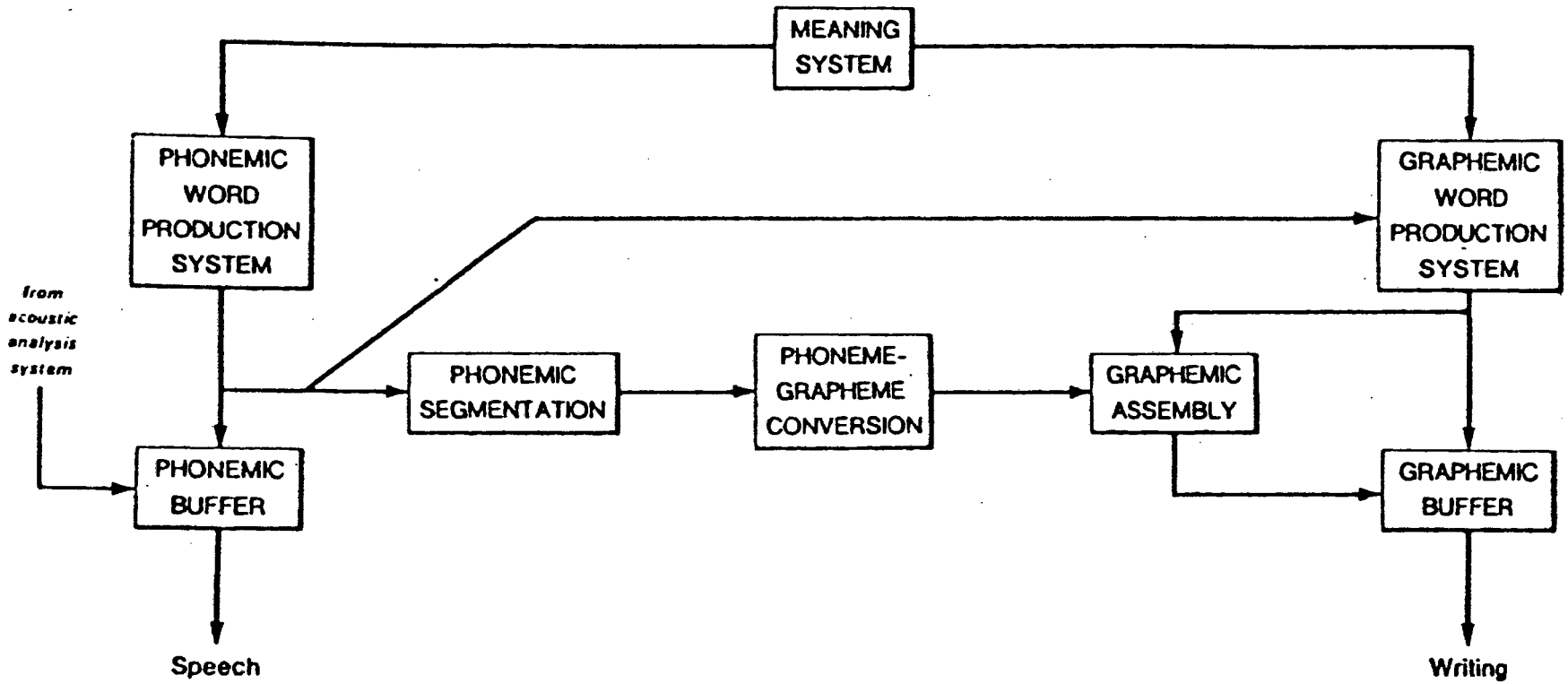


FIGURE 4.3.2 [B]

A MODEL FOR BOTH ADDRESSED & ASSEMBLED SPELLING

(Extracted from Ellis, 1984, p.73)

Despite these constraints, the researcher decided to extract examples of those categories of most frequently occurring errors, to provide evidence of deficient areas of functioning.

A theoretical framework is a sine qua non in order to interpret an analysis of those spelling errors made by the 7 selected children. Ellis' (1984) model, already used for interpretive purposes in the reading test data also outlines all the component processes that a model of skilled spelling would seem to require. The "information processing" idiom used by Ellis is compatible with that adopted for much of the analysis in this body of research. An exposition of this model is unnecessary, since it's elements are adequately captured by the diagram in Figure 4.3.2 [B] above, which depicts two available pathways for spelling, viz. addressed (i.e. "visually stored") and assembled (i.e. phonically constructed) spelling. Ellis (1984) warns of the dangers of analysing spelling errors; acknowledging that whilst providing informative data they must be interpreted with care. He refers to the seductiveness of accepting a phonic mediation account of children's spelling, but states that "Learning to spell a word does not mean learning how to reliably assemble its spelling from its sound, rather it means establishing a graphemic word production unit and being able to access that unit when required" (p. 98). Ellis cites research by Dodd (1980) with profoundly deaf children that demonstrates their reliance on storing spellings in, and retrieving spellings from a graphemic word production system, in the absence of phonic mediational capacities.

Ellis states that normal writers make 2 fundamentally different sorts of errors when trying to write a word, viz:

1. When one knows the correct spelling, but inadvertently omits some letters, misorders them or even writes quite the wrong word (so-called "slips of the pen").
2. When one doesn't in fact know the correct spelling, and makes an incorrect attempt to write it.

The second type of error is more commonplace, and Ellis suggests that they are in fact errors of knowledge, when the graphemic form of a word is not stored completely or correctly in a writer's graphemic word production system. He indicates that skilled writers will quite often possess some information about the spelling of at least parts of a word; this partial knowledge, when present, being supplemented by strategies for converting phonemic forms into letter strings. Ellis acknowledges that individual differences exist; that "Most adults are probably good or mediocre at both these skills, but there may exist a minority who are good at spelling from memory but poor at spelling from sound (true 'Chinese') and a complementary minority who are good at spelling from sound but poor at spelling from memory (true 'Phoenicians')" (Ellis, 1984, p. 76). [1] For children from deprived environments, with a limited exposure to a wide variety of words, there may be a conflict regarding which strategy to adopt, for an inadequate store of words in one's word production unit (very likely, due

to restricted learning/reading opportunities) would suggest the adoption of a phonic route. This route, however, calls for accurate input data gathering, followed by analysis of the letter string, comparison with existing phonic correspondences, and accurate graphic communication of the final product. The consistently noted deficiency present in a variety of tests of a lack of/impaired need for precision, at both the Input and Output processing levels, suggests that whilst having to resort to a phonic route, spellings will be inaccurate due to the generalised nature of such deficiencies over a wide range of content. If an equivalent "visual approximation strategy" is used in the spelling process (refer UCT GRT Results section), the resulting intermingling of strategies employed by children such as those in this sample could well provide examples of a hybrid, which in Ellis' terminology, could be referred to as "Phoecheese" (those forced to resort to phonetic routes, who prefer not to analyse, and incorporate inaccurate visual correspondences to resolve their difficulties!)

Of the 7 children selected for the spelling error analysis, 1 undertook the English form of the tests. Due to the inherent differences in these 2 languages, her spelling error profile is presented separately.

The single English speaking case represented (Case No. 8) attained an age-equivalent spelling ability of approximately 8 yrs 6 mths, for her chronological age of 11 yrs 8 mths.

She did in fact attain the lowest standard score of all cases in the sample (SS = 2.31). A detailed analysis of her spellings provided the following observations:

1. A high incidence of phonetic misspellings of irregular words (e.g. rufe = rough; soaser = saucer; tuch = touch; reseef = receive; roag = rogue; nuckle = knuckle; decid = decide; yogley = usually; sipethy = sympathy) showed evidence of a lack of available equivalent words in her graphemic production system (and implicitly, an inadequate store of knowledge, which is characteristic of these children, given their backgrounds).

2. An equally high incidence of incorrectly spelt regular words; some of which show evidence of "Phoecheese" strategies (e.g. publich = publish; sefril = several; servis = surface; plesint = pleasant; wisil = whistle; vegarbil = vegetable; inprofment = improvement).

3. Certain word endings were simply omitted (e.g. suga = sugar; scrap = scrape; don = done; decid = decide) suggesting a lack of visual/auditory checking, once the word was written; and a dearth of basic rules for English spelling, like the "magical effects" of an 'e' at the end of a word.

4. The researcher is sure that an indepth study would produce evidence of the adverse effects of operating an English semantic production system, in a predominantly Afrikaans environment.

The errors of the 6 remaining Afrikaans speaking children from the selected group were pooled, and each test item's variety of error responses examined. This process yielded 7 possible categories of incorrect responses. These categories are neither exhaustive nor mutually exclusive, since an error could display characteristics that fit two categories simultaneously. The categories identified and examples of the errors are presented (in order of prevalence), following a summary of the characteristics of each of the 6 Afrikaans children comprising this group.

TABLE 4.3.2 [II].

SUMMARY OF 6 CHILDREN SELECTED FOR SPELLING ERROR ANALYSIS

1.	Case No. 4	Boy	Age 9:02	SPEL SS 5.44	A/E approx.	8:01
2.	Case No. 7	Boy	Age 11:07	SPEL SS 7.36	A/E approx.	9:05
3.	Case No. 9	Girl	Age 13:01	SPEL SS 9.53	A/E approx.	12:03
4.	Case No. 10	Boy	Age 12:10	SPEL SS 7.49	A/E approx.	9:10
5.	Case No. 19	Boy	Age 16:01	SPEL SS 5.07	A/E approx.	9:00
6.	Case No. 21	Girl	Age 16:10	SPEL SS 4.25	A/E approx.	14:00

Note: A/E indicates the age equivalent of the achieved raw score in the format YY:MM.

TABLE 4.3.2 [III]

SPELLING ERROR ANALYSIS: SUMMARY OF CATEGORIES OF ERRORS

1. Incorrect word endings, as in:

* t instead of d (e.g. tyt = tyd; skinkbort = skinkbord; verbouereete = verbouereerd);

* d instead of t (e.g. muskied = muskiet; koeverd = koevert; magiestraad = magiestraat; ruggraad = ruggraat);

* -kie instead of -tjie (e.g. seunkie = seuntjie; {biekie / bekie / bikie} = bietjie; {karekie / karikie} = karretjie; wielekie = wieletjie);

* -akie/-aaitjie instead of -aadjie (e.g. {varkkramenakie / varkkarmenaaitjie} = varkkarmenaadjie);

* -ker/-i instead of -ger (e.g. {honker / honi} = honger);

* omitted letters (e.g. semen = sement; peroodie = periodiek; meskie = muskiet).

2. Incorrect phonemes, as in:

* instead of "y" (e.g. gorduin = gordyn; {ontiundig / onteudig} = ontydig; medesuine = medisyne; deinserig = dynserig; oonskeunlik = oenskynlik);

* instead of "ei" (e.g. {palys / paluis} = paleis; eyenaarres = eienares; karwer = kaweier; soverinietyd = soewereiniteit);

* instead of "ui" (e.g. {lyster / leister / liurste} = luister; reneer = ruïneer);

* instead of "eer" (e.g. stoedeurkamer = studeerkamer; ruineur = ruineer; simpatisie = simpatiseer);

* instead of "oe" (e.g. {soverinietyd / sovereinetyd} = soevereiniteit; medoonloos = meedoenloos);

* instead of "eu" (e.g. {heenig / hyning / huning / heening / hening} = heuning; {ondeed / ondede / ondeende / onleende} = ondeunde);

* instead of "aar" (e.g. {verw / warwel / varwel} = vaarwel);

* instead of "oë" (e.g. oonskeunlik = oënskynlik).

3. Incorrect consonants, as in:

* v/w instead of f (e.g. vamielielewe = familielewe; {soeva / sowat / sova / sowee} = sofa; {vervlentede / verventerde / virvlented} = verflenterde; vervraaijing = verfraaiing; oviesieleel = offisieel; {vlekvlooireir / vlikvlouerig / vlukvloeierei / vlikvrerry} = flikflooiery);

* f/w instead of v (e.g. winger = vinger; feereenging = vereeniging);

* b instead of p (e.g. besiemesties = pessimisties);

* sundry consonants omitted/misplaced (e.g. {brome / blome} = blomme; godyn = gordyn; skinbord = skinkbord; karetjie = karretjie; {daaiste / daste /dwaaste / dwarste} = dwaasste; {kolosaal / klosaal / kolosa} = kolossaal; {bestawing / beskaweng / bestrawing} = bestrawwing).

4. Incorrect phonological decoding AND/OR short term memory problems characterized by lack of correspondence between graphemes and phonemes, particularly in the more difficult multisyllabic words, as in the following examples:

{oomdiel / oomlik / oomlike} = oomblik; {gelik / geleg} = gelukkig; kartjie = karretjie; liwaaklig = lawaaierig; jewel = juwelier; herring = herinnering; {reorgenaarsaasie / reorgaaniesasie / roggannniesaasie} = reorganisasie; {bestoeisteeme / bespoueskeumg / bespruingskrywe} = besproeiingskema; {lobotoereem / lebaram} = laboratorium; {ingenoehasie / insanasie / insinoosie / insinowasie} = insinuasie; natarasie = naturalisasie; {majasskeese / meijastase / mahieses} = majestueuse).

5. Incorrect vowell usage, as in

* "e" (e.g. limoen = lemoen; sament = sement; {sienwegteg / seunweegtig} = senuweeagtig);

* "i" (e.g. gelukkeg = gelukkig; reorganiesasie = reorganisasie;);

* "u" (e.g. joewelier = juwelier; {mieskiet / miskiet} = muskiet; {reggaat / riggraad} = ruggraat; gelikig = gelukkig; langdeurig = langdurig);

* "o" (e.g. {koopie / knoopie} = knopie).

6. Unusual phoneme-grapheme correspondences, as depicted by the use of the letter "j" in the following manner:

* (e.g. vermooijins = vermoeienis; tooijingrig = toiingrig; genooije = genoee; {loboratorijim / laboratorrijam} = laboratorium; parijodiek = periodiek).

7. Influence of the English speaking code in the following instances:

* (e.g. no = nou; jewel = juwelier).

It would appear that all 7 cases relied heavily on inefficient phonetic decoding strategies. Such characteristics would in general terms warrant the use of a term such as "reading & spelling retardation / learning disability", since the lack of sociocultural opportunity disqualifies the use of the term "dyslexic" (Ellis, 1984, p. 105).

4.3.3 UCT TEST INTER-CORRELATIONS

Before examining the patterns that emerged from these results, it is interesting to note the correlations between each test. These are tabulated below:

TABLE 4.3.3 [I]

UCT TESTS INTER-CORRELATIONS

TEST	GRT	SRT	SPEL
SRT	.6929		
SPELLING	.7886	.5379	
LINES LEFT OUT (LLO)	.2212	.5768	.0363

(NOTE: GRT = Graded Reading Test & SRT = Speed Reading Test)

There are few significant correlations with other tests administered in this battery. Interestingly the Graded Reading Test (GRT) recorded no significant correlations apart from those above. The Speed Reading Test (SRT) accounts for two significant correlations; that with the WISC-R VIQ (r = .4342) and the WISC-R Digit Span subtest (r = .5823). The shared relationship with the Digit Span subtest probably reflects the "attention factor" specifically referred to in the section on Auditory Memory (refer section 4.4.5.2). The Spelling Test recorded only one significant other correlation, with YRSPSK (r_= .5443). This highlights the visuographic nature of the spelling task, for there is evidence of a consistent link between visuographic tasks and YRSPSK in this research.

The fact that no significant correlations exist between these language assessments and the scholastic achievement measure, SEPTAV, is worthy of comment. Whilst reading and spelling are significantly related to learning at the primary school level, it would appear that the abilities measured by the UCT tests relate specifically to the cognitive processes employed in decoding words, including:

a) Transmitting visual/auditory stimuli to the appropriate primary input unit located in the brain.

b) Analysing and integrating the information received at the primary area in the corresponding secondary area.

c) The simultaneous integration across senses which occurs to complement the sequential processing of the secondary units, as

in the auditory-vocal integration required in reading, and auditory-tactile integration necessary for writing. (Golden, 1981)

Results such as these should caution those researchers working in the area of estimating pre-morbid IQ using performance on reading lists, in generalising results either to populations of children, or to those from deprived environments (Nelson & O'Connell, 1978; Tredoux et al., 1987).

The last remaining aspect to report relates to the noticeable emergence of specific areas of strength/weakness. Six children in the sample achieved above the mean consistently in all 3 tests (3 younger and 3 older children). The fact that all children who achieved <u>below the mean for the GRT</u> also did so on the SRT has already been mentioned. Seven of these children (87.5%) recorded below average performances on all 3 UCT tests; the remaining child achieved below average for both the GRT & the SRT.

An analysis of those 13 children who recorded <u>below average performances on the SRT</u> is more complex, and summarised below:

7/13 (53.8%) recorded below average performances on all 3 tests.
3/13 (23.1%) recorded below average performance on the Spelling Test also.
1/13 (7.7%) recorded below average performance on GRT also.
2/13 (15.4%) recorded no other below average performances.

The analysis of those 12 Spelling Test scores below the mean is similarly recorded below:

7/12 (58.3%) recorded below average performances on all 3 tests.
3/12 (25.0%) recorded below average performance on SRT also.
2/12 (16.7%) recorded no other below average performances.

Once ordered in this way the task of deriving significant deficit areas for groups of children becomes easier. It is also possible to rank order the groups according to the numbers of children comprising them.

The largest group is that of the 7 children who recorded consistently below average performances on all 3 tests, and comprised 5 children from the younger age group, and 2 from the older age group. The second group which contributed to poor test performance is that of 3 children who scored below average on both the SRT and the Spelling Test. The third group, comprising 2 sub-groups of equivalent numbers is that of the 2 (younger) children whose scores on the SRT "stand alone", and the 2 (older) children whose scores similarly "stand alone" on the Spelling Test. Finally, the last "group" comprises 1 child, who achieved below average scores on both the GRT and SRT.

Whilst it is not possible to weave these results into a theoretical fabric, they do provide distinct guidelines for those wishing to establish programs to assist the low functioning groups.

Ellis (1984) stresses the fact that both reading and writing draw in concrete, information-processing terms on a child's aural vocabulary. The child who encounters utterly unfamiliar words in his reading books has to create a new visual recognition unit, learn a new meaning and establish a new phonemic word production unit for each new word. The children assessed exhibited restricted aural vocabularies. This limitation necessitates a reliance on the phonic route for both reading and spelling, resulting in a similarity with developmental surface dyslexics.

An observation made by the researcher relates to the fact that the only child that she saw reading, during visits to "the Village" for assessment purposes, was a visitor (a friend of one of the children).

Ellis (1984) states that when it comes to teaching developmental dyslexics, "phonic" methods appear to be the most successful. He suggests that this may be because these methods tutor both reading and spelling routes. In Feuersteinian terms a "phonic" approach would provide the child with analytical tools that would <u>discourage</u> the existence of blurred and sweeping perception in addition to <u>encouraging</u> planned, systematic exploratory behaviour.

Finally, only a passing reference has been made about the influence of particular languages/dialects. McCormick (1986)

draws attention to the fact that for many children who lived in District Six the constraints governing language use in informal neighbourhood interaction prevented the use of such interaction for the consolidation of skills in the standard dialects which they were exposed to, and were in the process of acquiring, at school. Chomsky (1970) and Read (1971) describe preschool children who spontaneously created their own spelling systems, and spelt words as they pronounced them. This fact probably accounts for the use of the "-j" graphemes mentioned above. The significance of information provided by analysing spellings is highlighted by Chomsky and Reads' assertions that children's spellings can "yield insights into their systems of sound representation, segmentation, and categorization" (Ellis, 1984, p. 97).

4.4 THE INTEGRATIVE PARAMETER:

In describing the evolution of the growth in knowledge related to the integrative functions of the central nervous system (CNS), Gaddes (1981) cites the neurophysiologists of the 19th century as providing the first writings at length on this topic. In 1890 William James wrote: "The function of the nervous system is to bring each part into harmonious co-operation with every other" (James, 1890, p. 8). More significantly, he integrated his experience as both physiologist and psychologist when he related man's mental structure to the function of the nervous system. Sherrington followed with his classic book, "The Integrative Action of the Nervous System" (1906), in which he discounted Pavlov's reflexology as "a convenient, if not probable, fiction" since "all parts of nervous system are connected together". The interest in integrative CNS functioning did not stem the tide of the mechanistic behaviourism of J.B. Watson, nor the connectionism of E.L Thorndike, in America. However, during this period two holistically oriented "psychologists" emerged in Europe, Maria Montessori and Jean Piaget. Montessori (1912) stressed early motor activity as an essential precursor to healthy intellectual and personality development, whilst Piaget (1952) developed a model of psychological ontogeny which he conceptualised as the product of the adaptive interaction between the neural functions of the child, and the opportunities for expression and the forces of inhibition offered by the immediate environment.

Piaget maintained that all human growth begins in an early stage of sensorimotor activity and awareness; that out of this develops cognitive recognition of concrete perceptual relationships, and finally, in adolescence, the understanding of abstract conceptual associations.

In special education the theoretical orientation encapsulated in both Montessori and Piagets' theories has been adopted to promote a multi sensorimotor approach to remediation (e.g. Fernald, 1943; Klephart, 1971).

4.4.1 LURIA'S DEVELOPMENTAL MODEL OF INTEGRATIVE FUNCTIONING

Luria (1966, 1973), the Soviet Union's eminent neuropsychologist, has formulated a functional system theory of behaviour, in which a limited number of brain areas are involved with each behaviour, each in a specific and predictable manner within the functional system. Golden (1981) suggests that a functional system may be thought of as a chain, with each link of the chain representing a particular area of the brain. If any part of a functional system is broken, the behaviour represented by the chain is broken. Since Luria's theoretical model assists in understanding the development and importance of adequate integrative functioning, it will be described briefly.

Luria envisaged that all functional systems involve three basic units of the brain: (1) the arousal unit, (2) the sensory input unit, and (3) the output planning unit.

1) The Arousal Unit: This consists of those parts of the brain identified as the reticular activating system (RAS), a system of diffuse intertwined structures that act to raise or lower cortical arousal. The system is necessary for survival and behaviour, since without arousal the cortex is unable to respond to incoming stimuli. In addition to its role in arousal, the RAS is also responsible for filtering sensory input, especially from those senses that are always "on" (e.g. tactile/kinesthetic and auditory). This prevents the cortex from being flooded with constant irrelevant stimuli, which can interfere with cognitive processing. Thus it plays an important part in attention, concentration and other similar processes.

2) The Sensory Input Unit: This unit is responsible for most early learning skills as well as for many of the abilities measured by intelligence tests. It can be divided into 3 areas of the cortex: primary, secondary and tertiary. The primary areas act as sensory reception zones, receiving input on a "point-to-point" basis from the appropriate sense organ, and thus starting the initial integration process. The auditory primary area is located in the temporal lobes of the cortex, the visual in the occipital and the tactile/kinesthetic in the parietal lobes. Corresponding to each primary area is a secondary area, which analyses and integrates information received at the primary area, processing information sequentially. The tertiary area of the sensory input unit, located in and around the parietal lobe, is responsible for cross-modality integration. Here the auditory, visual and tactile information is fused and

analysed simultaneously. This simultaneous integration across senses complements the sequential analysis of material initially integrated. The tertiary parietal area plays a primary role in many of the tasks commonly subsumed under "intelligence". Injuries to the tertiary area can result in the loss of a variety of skills due to the loss of integrative functions across two or three sensory modalities.

3) The output/planning unit represents the highest development of the mammalian brain. The primary area of this unit is the motor output area of the brain; the secondary area is the unit responsible for organising the sequencing of motor acts, which includes organisation of the temporal pattern of movement. These two areas do not function alone, but rely on intricate feedback circuits that require tandem development. The tertiary area, located in the pre-frontal lobes, subsumes the major tasks of planning (decision-making), evaluation, temporal continuity, impulse and emotional control (delay of gratification), focussing of attention and flexibility (creativity). (Golden, 1981, p. 281-286.)

Logue (1970) refers to the cognitive processing between the input and output phases as the "area of integration" (p. 61). This is similar to Feuerstein et al.'s (1979) term "Elaborational level". Logue openly admits that what happens between the intake and output phases is only partially understood, and cites Penfield & Robert's (1959) reference to the state of "honest doubt" that presently exists in this field of enquiry.

In order to delineate more precisely possible areas of cognitive impairment Feuerstein and his associates developed a "map" of cognition and problem-solving. Whilst a detailed knowledge of this map is essential to Feuerstein's diagnostic and remedial work, for the purposes of this research only certain aspects will be sketched.

4.4.2 FEUERSTEIN ET AL.'S MODEL OF DEFICIENT COGNITIVE FUNCTIONS

Feuerstein and associates' work over the past 30 years with culturally deprived children has resulted in their formulation of an inventory of cognitive functions that may be undeveloped, poorly developed, arrested and/or impaired. Since much of the interpretive aspects of this research derive from the theoretical formulations of Feuerstein et al. (1979), it is necessary to present a synopsis of the relevant aspects of this theory.

Feuerstein's model is conceptually similar to Budoff's (1967) measurement approach, and is characterised by a dynamic as opposed to static strategy, to tap the modifiability of individuals - particularly those described as mildly mentally retarded, culturally deprived or socially disadvantaged. The static model, Feuerstein argues, imposes a constant and unmodifiable framework on the individual's potential; whereas the object of the search should be for the opportunities of change and the optimal conditions which promote it.

This approach is vehemently opposed to the geneticist's static and deterministic view. Implicit is also a criticism of the environmentalists' incapacity to find an alternative form of assessment, which provides for a dynamic, open-ended nature of intelligence that distinguishes between manifest and potential performance. The implications for education are implicitly stated in the emphasis placed on an active-modificational approach, which lends credence to notions of "democratisation" and "meritological ideal" (Shochet, 1986).

Whilst recognising a variety of etiological factors in cognitive deficiency, Feuerstein et al. (1980) specified that the central tenet hinged on inadequate and insufficient "mediated learning experience" (MLE); i.e. "the way in which stimuli emitted by the environment are transformed by a mediating agent, usually a parent, sibling or other caregiver. This mediating agent, guided by his intentions, culture, and emotional investment, selects and organises the world of stimuli for the child" (p. 15-16). Thus retarded development is viewed as a result of inadequate or insufficient instruction; where the definition of instruction is broader than that of a formal educational setting, and may occur in a variety of contexts. Reference to MLE was made in the Introduction (refer section 1.3.1), where a fuller exposition was developed.

Through mediation the child acquires the learning sets or cognitive structures and functions (e.g. spatial orientation,

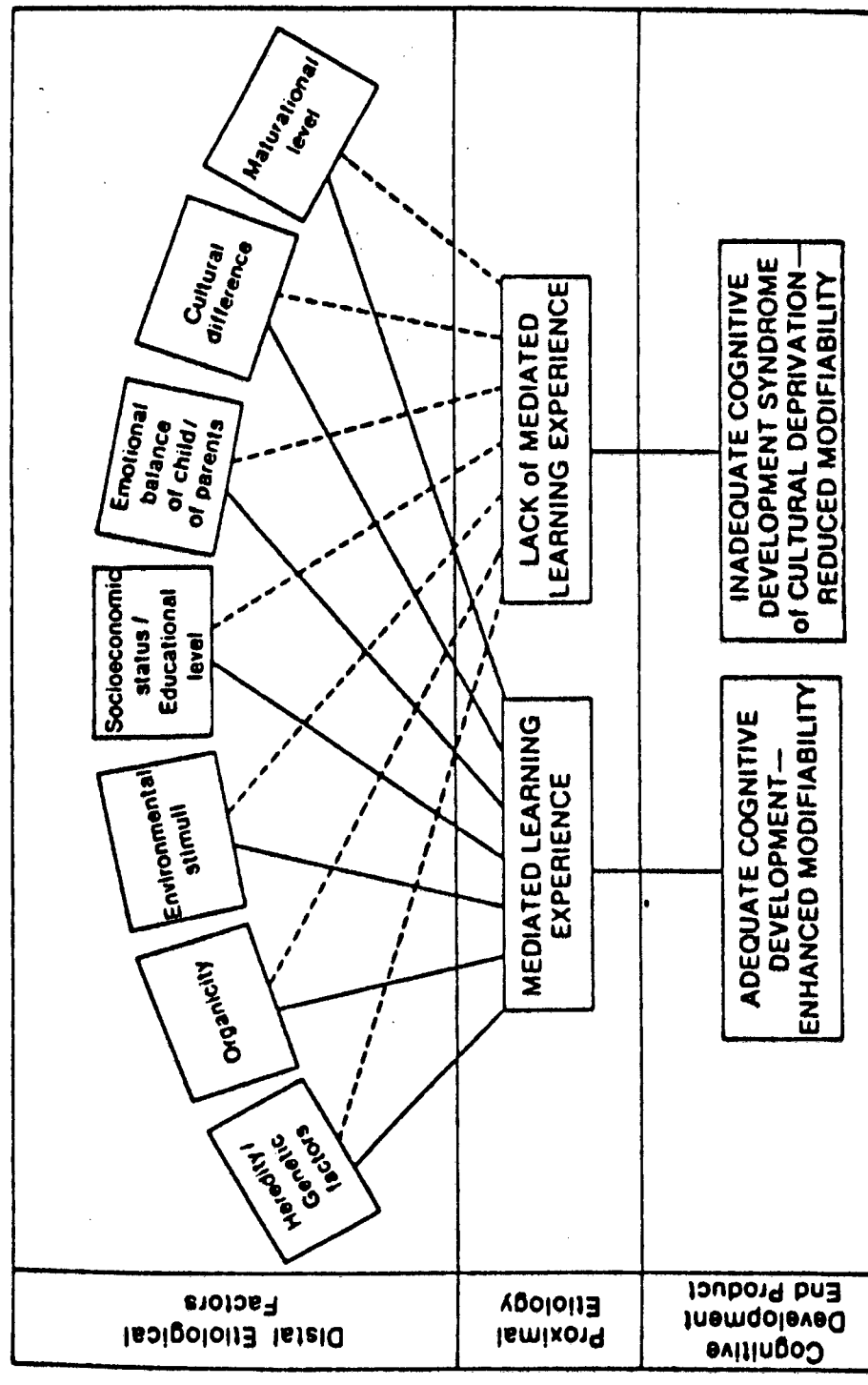
temporal relations, conservation of constancies) which will enable her/him to learn through direct exposure to stimuli. The earlier a child is exposed to MLE, the more receptive his/her capacity to become modified by exposure to stimuli, and vice versa. Not all (parent-child) interchanges fulfill the mediational parameters, as characterised by intentionality, transcendence, meaning, competence and regulation of behaviour.

The lack of MLE is regarded as necessary and sufficient to cause cognitive impairment. Feuerstein et al. (1979) pointed out that this may be triggered off by distal etiological factors, such as poverty, educational level of parents and cultural differences. These factors he labels as distal etiologies, since their occurance is not isomorphic with deficient cognitive functioning (Refer Figure 4.4.2 [A], below). Reversibility can occur in a meaningful way beyond the distal etiologies that have produced cognitive impairment, by moving from the distal to the proximal determinants of a lack of MLE. The emphasis rests with "optimal" periods for development, certainly not "critical" periods beyond which no hope of change exists (Shochet, 1986).

Deficient learning sets affect 3 phases of cognitive operations, viz: the input, elaborational and output phases. Feuerstein and his associates (cited in Haywood et al., 1975) have listed 28 different skills that may be lacking or deficient in children with a deficit in MLE. These are listed below.

FIGURE 4.4.2 [A]

Distal and Proximal Etiologies for Differential Cognitive Development



Impaired cognitive functions affecting the INPUT LEVEL (I/L) include those impairments concerning the quantity and quality of data gathering by the individual as he/she is confronted by a given problem, object or experience. They include:

1. Blurred and sweeping perception.
2. Unplanned, impulsive, and unsystematic exploratory behavior.
3. Lack of, or impaired, receptive verbal tools which affect discrimination (e.g. objects, events, relationships etc. do not have appropriate labels).
4. Lack of, or impaired, spatial orientation; the lack of stable systems of reference impairs the establishment of topological and Euclidian organization of space.
5. Lack of, or impaired, temporal concepts.
6. Lack of, or impaired, conservation of constancies (size, shape, quantity, orientation) across variation in these factors.
7. Lack of, or deficient, need for precision and accuracy in data gathering.
8. Lack of capacity for considering two or more sources of information at once; this is reflected in dealing with data in a piecemeal fashion, rather than as a unit of organized facts.

The severity of impairment at the Input Level may also affect ability to function at levels of Elaboration and Output, but not necessarily so.

Impaired cognitive functions affecting the ELABORATIONAL LEVEL (E/L) include those factors that impede the efficient use of available data and existing cues:

1. Inadequacy in the perception of the existence and definition of an actual problem.

2. Inability to select relevant vs. non-relevant cues in defining a problem.

3. Lack of spontaneous comparative behavior or limitation of its application by a restricted system.

4. Narrowness of the mental field.

5. Episodic grasp of reality.

6. Lack of, or impaired, need for pursuing logical evidence.

7. Lack of, or impaired, ability to "internally" (mentally) represent data.

8. Lack of, or impaired, inferential-hypothetical, "iffy" thinking.

9. Lack of, or impaired, strategies for hypothesis testing.

10. Lack of, or impaired, ability to define the framework necessary for problem-solving behavior.

11. Lack of, or impaired, planning behavior.

12. Non-elaboration of certain cognitive categories because the verbal concepts are not part of the individual's verbal inventory on a receptive level, or they are not mobilized at the expressive level.

"Thinking" usually refers to the "elaboration" of cues. Highly original, creative and correct elaboration may yield incorrect responses if it is based on inappropriate or inadequate data on the Input Level.

Impaired cognitive functions on the <u>OUTPUT LEVEL</u> (O/L) include those factors that lead to an inadequate communication of the final solution. Even adequately perceived data and appropriate elaboration can be expressed as an incorrect or haphazard solution if difficulties exist at this level.

1. Egocentric communicational modalities.
2. Difficulties in projecting virtual relationships.
3. Blocking.
4. Trial and error responses.
5. Lack of, or impaired, tools for communication adequately elaborated responses (summative behavior missing).
6. Lack of, or impaired, need for precision and accuracy in communicating one's responses.
7. Deficiency of visual transport.
8. Impulsive, acting-out behavior.

(Feuerstein et al., 1979 p 58-61)

The complexities inherent in neatly locating "the integrative functions" for analysis, given the currently available source of knowledge, is presumptuous. Gaddes' (1981) reference to sensorimotor integration indicates the variety of activities included (i.e. sensory as well as motor), not to mention those subsumed within the cognitive realm. The result is a degree of overlap between certain sensory-motor and cognitive components assessed in the integrative parameter, and in other parameters. In the face of such repetitions reference will be made to assessment results presented in other sections. The use of the term "integrative" implicitly assumes a degree of commonality with other parameters, and the fact that such repetition occurs attests to the complex nature of the field.

For the purposes of this research the following topics will be considered within the realm of the "Integrative Parameter": (1) Sensorimotor Integration; (2) General Intelligence; (3) Memory and (4) Concentration.

4.4.3 SENSORIMOTOR INTEGRATION

Gaddes (1981) states that sensorimotor integration is essential to normal behavior and learning, its importance being supported by neurological and neuropsychological studies. He envisages an hierarchical pattern of integration; with small units, such as cells, requiring harmonious intraorganic functioning; and regional groups of cells, such as cortical lobes, requiring internal consonance, free of all conflicts. Since all behaviour is mediated by the CNS, normal learning implies the system's complete and integrative functioning, on both structural and operational levels.

The significant contribution of adequate sensorimotor integration in the development of the child's intellectual abilities has already been discussed in the introduction to this parameter. Evidence from the WISC-R intelligence assessment used in this research suggests that poor Performance IQ scores can be accounted for by the presence of deficits in the visual field, in particular. In view of this, the selection of visuographic functioning, whilst providing only a small sample of the variety of sensory integrative functions possible, focuses on visual processing skills which appear to exhibit an invasive influence in a variety of the dimensions tapped by the assessment battery.

4.4.3.1 VISUOGRAPHIC FUNCTIONING

Three tests were used to assess this aspect, viz.:

i) Beery's Developmental Test of Visual-Motor Integration (BEERY VMI);

ii) The Goodenough-Harris Drawing Test (DAP);

iii) The Mazes subtest of the WISC-R (MZ).

Each of these tests is considered separately; a summary of all three tests' results for each child (case) presented graphically (Refer Figure 4.4.3 [A], below); and a breakdown of the sample by sex and age, to compare performance within these groups, presented in Table 4.4.3 [I] below.

A critical examination of significant inter-correlational data between these test results and a selection of variables provides provocative evidence that queries some claims made by test designers, adding weight to the growing concern regarding the application of conventional measures in an inappropriate cultural setting.

4.4.3.1.1 THE DEVELOPMENTAL TEST OF VISUAL-MOTOR INTEGRATION

INTRODUCTION: DESCRIPTION OF THE TEST

Following research conducted with Klephart (1971), Beery became aware of significant correlations between children's abilities

to copy geometric forms and their academic achievement. In keeping with the evolving educational theories of Birch (1963), Bruner (1964), Hunt (1961), Piaget (1952) and Vereecken (1961), which supported the belief that intelligence and achievement have a sensorimotor basis in development, Beery saw a need for developing a sequence of geometric forms, from simple to difficult, for young children to copy, as an aid to assessing their sensorimotor development (Beery, 1982).

After experimentation with many existing and novel geometric forms and test formats, Beery arrived at the present visual-motor integration (VMI) sequence of 24 forms; each one with an established developmental age and developmental characteristics.

The current 1981 norms are based on a sample of 3,090 children; ages 2 yrs 9 mths to 19 yrs 8 mths; ethnicity comprising 64.9% Caucasian, 15.7% Black, 12.1% other, 7.3% Latino; income groups including 27.2% low, 72.8% high; sexual groups 51.3% male, 48.7% female. For practical and statistical purposes all ethnic, sex and socioeconomic groups were combined in the normative data tables.

Beery (1982, p. 16) notes that "the reliability (consistency) of the VMI has been good". Average correlation between 2 or more scorers is reported as .93; probably due to the well defined scoring criteria provided in the manual. Inter-scorer

reliability measures were not made in this research, due to the fact that the author was the lone scorer. The need for an inter-rater correlation was not deemed necessary, due to the explicitly defined scoring procedures, and high scorer reliability.

VMI is cited as "the underlying, key factor for handwriting performance" (Beery, 1982, p. 16). Beery's 1981 VMI norming study produced a statistically significant difference among children of Black, Caucasian, Latino, and other ethnic backgrounds. However, on investigation, nearly all the variance in test scores was attributable to chronological age, with less than 1% of the variance attributable to ethnic background. Beery concludes (1982, p 17): "Compared to other types of tests, the VMI is one of the least culturally biased".

Beery found only 3.25% of variance in the VMI scores attributable to income level; but acknowledges that those studies that have not found significant differences among various socioeconomic groups on VMI test scores, agree that the VMI is particularly sensitive as a predictor of low socioeconomic groups' achievement (Bray, 1974; Buktenica, 1966; cited in Beery, 1982). Why? The answers to this question are provided by the suggestion that Beery's test focuses on the presence of deficient cognitive functions, characteristic of children from culturally deprived environments. The analysis of the current research sample's results provides ample evidence of

those deficient cognitive functions listed by Feuerstein et al., above.

Beery (1982) states that comparisons of the VMI with psycholinguistic ability tests (Bannatyne, 1969) link it to adequate functioning in other areas. He also found the VMI correlated highly with "automatic-sequential" subtests of the Illinois Test of Psycholinguistic Abilities, and only moderately with those tests tapping less integrative skills (Beery, 1967). He cites Bateman (1966) in concluding that "typically, children with learning disorders display the most difficulty with such integration tasks" (Beery, 1982, p. 18).

BEERY TEST RESULTS

The standard score (SS) format used to depict the results has a mean of 10, and standard deviation of 3. Probably the most startling feature of the test results is the extremely low scores, as depicted by the sample mean of 3.4; with a mode of 1. No child attained a score of 10 (the normative sample mean); the maximum SS for the sample was 8; the minimum SS 1. Figure 4.4.3 [A], below, presents each child's (case's) SS for this test. The decline in SSs with the increase in age of the children, is highlighted by the significant correlation between BEERY VMI & AGE of -.5769. Upon investigation of the data this trend was particularly noticeable in the group of older girls, as can be seen in Table 4.4.3 [I], below.

BEERY VMI, DAP & MAZES RESULTS:

FOR EACH CASE NUMBER

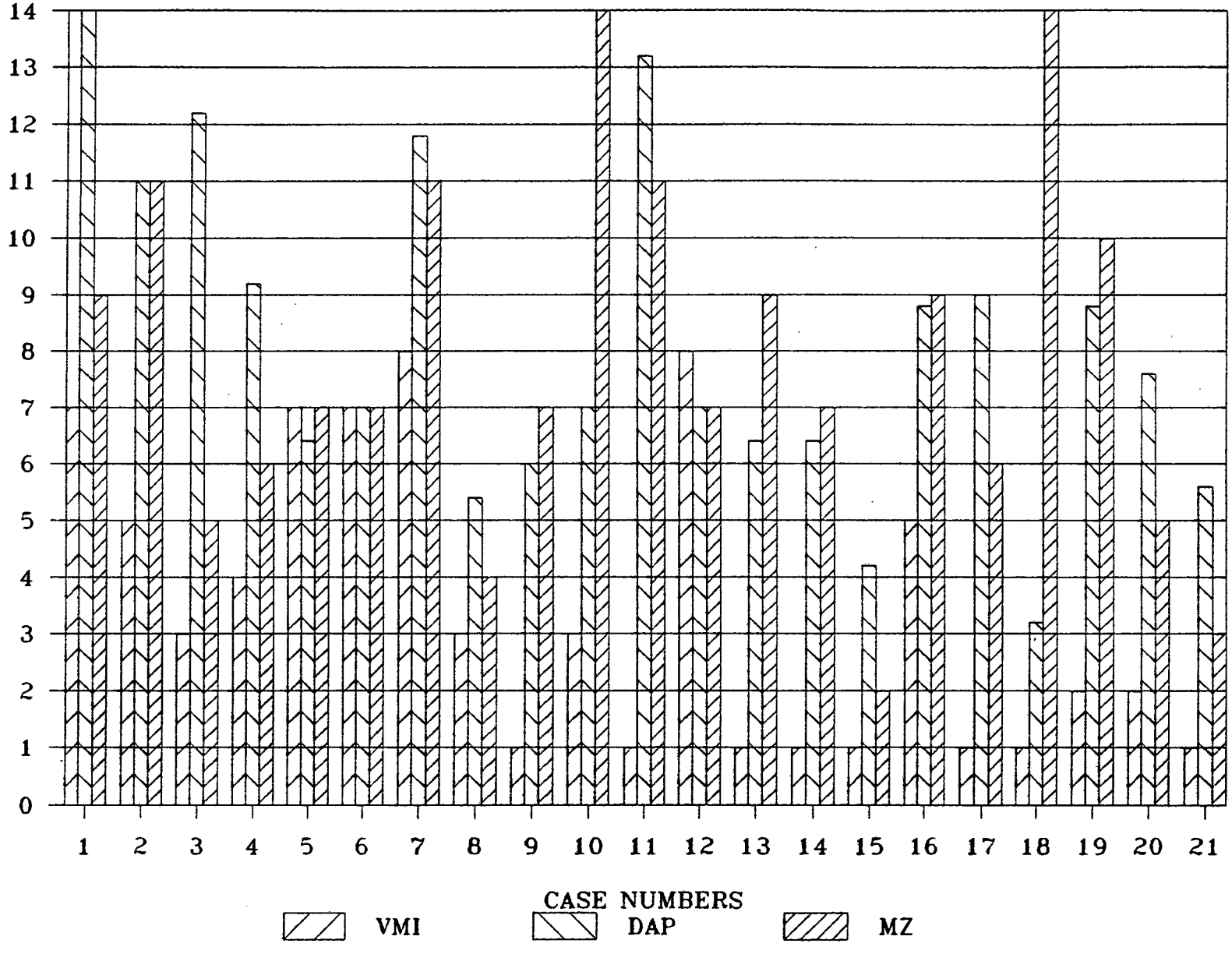


FIGURE 4.4.3 [A]

TABLE 4.4.3 [I]

VMI, DAP & MZ RESULTS SHOWING MEANS FOR DIFFERENT GROUPS

GROUP DESCRIPTION	NO IN GROUP	VMI MEAN	DAP MEAN	MZ MEAN
Entire sample	21	3.4	8.1	7.8
Boys	11	4.1	9.7	9.4
Girls	10	2.7	6.4	6.1
Children <13 yrs	11	4.5	9.4	8.4
Children >12 yrs	10	2.3	6.7	7.2
Boys <13 yrs	6	4.6	11.0	10.3
Girls <13 yrs	5	4.2	7.4	6.0
Boys >12 yrs	5	3.4	8.0	8.2
Girls >12 yrs	5	1.2	5.4	6.2

The significantly poorer performance of the older girls resulted in a focused examination of both their correct and incorrect responses. Table 4.4.3 [II] below summarises the pattern of responses of these 5 girls for all 24 forms of the test. The incorrect responses for those forms where 3 of the 5 girls failed to reproduce the form correctly were then selected for further investigation.

The group comprised 5 girls; whose ages and SSs were as follows:

1. Case No. 14: 13 yrs SS 1
2. Case No. 15: 13 yrs SS 1
3. Case No. 18: 15 yrs SS 1
4. Case No. 20: 16 yrs SS 2
5. Case No. 21: 16 yrs SS 1

TABLE 4.4.3 [II]

ANALYSIS OF 5 OLDER GIRLS' RESPONSES FOR THE BEERY VMI TEST

CATEGORIES	FORM NOS.	NO. CORRECT	NO. INCORRECT
1	16 17 21 24	0	5
2	19 20 22 23	1	4
3	14 18	2	3
4	12 13	3	2
5	10 11 15	4	1
6	1 to 9	5	0

It is important when interpreting Table 4.4.3 [II] (above) to be familiar with the 24 forms comprising the Beery VMI Test. However, even for those not acquainted with the test, a degree of clarity emerges, when the reasons/criteria for failure given in the test manual are examined, within the framework provided by Feuerstein et al.'s list of impaired cognitive functions. These deficient functions are not considered elements that are missing from the cognitive repertoire of the individual; rather they are conceived as being underdeveloped, poorly developed, arrested, and /or impaired. "A state of impairment is to be understood in the sense that these functions do not appear spontaneously, regularly and predictably in the cognitive behavior of the individual and/or when they do appear they show a marked inefficiency in the problem-solving behavior" (Feuerstein et al., 1979, p. 57).

The list of those scoring criteria occurring more than once, which resulted in failure in each of the forms within the first

3 categories in Table 4.4.3 [II] (above) is tabulated below. Such descriptive evidence provides testimony of the presence of a variety of deficient cognitive functions.

TABLE 4.4.3 [III]

DESCRIPTIVE LIST OF REASONS FOR FAILURE OF BEERY VMI TEST ITEMS:

FORM NO	REASON FOR FAILURE (As stated in Beery Test Manual)
Category 1: (No Correct Responses)	
#16	Opposing corners (especially horizontal) correctly aligned .
#16	Acute angles must be 60 degrees of less.
#17	Two inner triangle corners must touch near medians of outer triangle.
#17	Left outer angle must be approximately 90 degrees.
#21	Overlapping correct.
#21	At least one clean 3-D overlap.
#24	Correct intersection of double-line forms.
#24	One over- and one underlapping of the same triangle (without guidelines).
Category 2: (1 Correct Response)	
#19	All sides indicated.
#20	Opposing corners on horizontal/vertical plane.
#20	Both acute angles 60 degrees or less.
#22	Correct number of parts.
#22	No evidence of confusion.
#23	Inner form clearly shifted right and down.
Category 3: (2 Correct Responses)	
#14	Baseline fairly horizontal.
#18	Correct number of dots.

In a study of this nature, where assessment was conducted within the static paradigm, and test administration occurred in small groups, it is only possible to hypothesize regarding the presence of deficiencies responsible for the extremely poor performance of most of the children. The researcher suggests

that the types of descriptive errors listed in Table 4.4.3 [III] above can be accounted for by the presence of the following deficient functions at the Input and Elaborational levels:

* Blurred and sweeping perception (I/L);
* Unplanned, impulsive and unsystematic exploratory behavior (I/L);
* Lack of/impaired spatial orientation (I/L);
* Lack of/deficient need for precision and accuracy in data gathering (I/L);
* Inability to select relevant vs. non-relevant cues in defining the problem of reproducing the form (E/L);
* Lack of spontaneous comparative behavior, in contrasting the given and their own reproduction of the form (E/L);
* Lack of/impaired need for pusuing logical evidence in checking out the spatial relations on the reproduced form (E/L);
* Lack of/impaired planning behavior - especially regarding Form #21 & #24 which required 3-D over-lapping of double-line forms (E/L).

Those deficiencies most prominent at the Output level (O/L) were:

* Trial and error responses;
* Lack of/impaired need for precision and accuracy in reproducing the form;
* Deficiency of visual transport.

Whilst the impaired functions listed above were selected as being relevant for the selected group of older girls, they are no doubt present to a greater or lesser extent in most of the children in the sample. Their existance would account for the

extremely low performance scores. The content of the BEERY VMI test material can thus be seen to be extremely sensitive in focussing on a number of those cognitive skills which are undeveloped, poorly developed, arrested and/or impaired in children from culturally deprived environments.

INTER-CORRELATIONAL DATA

Correlations worthy of notice are the moderate negative relationships between BEERY VMI & both the children's age on admittance to Annie Starck Village (AGEADM r = -.6999), as well as the number of schools the children have attended in their primary school career (NOSKLS r = -.6264). These age related correlations suggest that the younger the child is admitted to Annie Starck children's home, the better she/he is likely to perform on the BEERY VMI test. The scenario depicted by these inter correlations are congruent with most expectations, viz. that a child who is removed at an earlier age from a stressful and most often deprived/depriving home environment, is more likely to perform well on assessments linked to scholastic achievement. Conversely, those who remain in home circumstances detrimental to learning and development perform badly.

Evidence such as this is explained by Feuerstein et al. (1980) in terms of the culturally deprived child receiving inadequate and insufficient "mediated learning experiences" (MLE).

The correlation between BEERY VMI & SEPTAV is low, but slightly higher with the variable labelled "pass/fail September average" (P/F), which in effect collapses the child's September term aggregate into one of two categories, pass/fail. These correlations are compared with those recorded for the WISC-R Full Scale IQ (FIQ) scores, to demonstrate that the BEERY VMI test taps a range of abilities, which contribute to scholastic achievement.

VARIABLE	BEERY VMI	WISC-R FIQ
SEPTAV	.4324	.4278
P/F	.5139	.6774
WISC-R PIQ	.5710	.9132
WISC-R FIQ	.5327	1.0000

The last set of correlations, significantly insignificant, are those related to the UCT Graded Reading ($r = -.1310$); UCT Speed Reading ($r = -.1213$); and UCT Spelling ($r = .017$) tests. This provides contradictory evidence to Beery's (1982) contention that VMI performance is linked to adequate functioning in psycholinguistic areas.

Table 4.4.3 [IV] below summarises the inter-correlations between the BEERY VMI and a selection of variables included in this study.

FIGURE 4.4.3 [IV]

SUMMARY OF VISUOGRAPHIC INTER-CORRELATIONS

VARIABLES	VMI	DAP	MZ
SEX	.2718	.5672	.5115
AGE	-.5769	-.5401	-.0693
FIQ	.5327	.2593	.2871
PIQ	.5710	.3602	.2974
BD	.6538	.3907	.2174
OA	.5928	.4563	.3209
AGEADM	-.6999	-.5423	-.2074
YRSPSK	.4909	.2804	.1691
NOSKLS	-.6264	-.3917	-.1325
SEPTAV	.4324	.2795	-.2502
P/F	.5139	.2515	-.1374
VMI	1.0000	.3580	.1445
DAP	.3580	1.0000	.2348
MZ	.1445	.2348	1.0000

4.4.3.1.2 THE GOODENOUGH-HARRIS DRAWING TEST

INTRODUCTION: DESCRIPTION OF THE TEST

Human figure drawings can be used to measure a child's developmental or intellectual maturity. Initial research in the field discovered 2 important findings: The order of development in the drawings of children is constant; and children of lower ability generally make inferior drawings (Klepsch and Logie, 1982). Goodenough (1926) published the first test for systematically evaluating children's drawings on a point scale method. Harris (1963) revised and extended this procedure, which became known as the Goodenough-Harris Draw-a-Man Test. Harris considers the test as a measure of intellectual or

conceptual maturity, including "the ability to perceive or discriminate similarities and differences, to abstract or classify objects according to similarities and differences, and to generalize or assign a discriminated object to a correct class" (Klepsch and Logie, 1982, p. 14).

The Goodenough-Harris Drawing Test (DAP) was administered as part of the small group assessment battery. Each child was provided with a blank sheet of paper and a pencil; requested to fill in their name, date of birth and the assessment date in the areas indicated at the top of the sheet, and then asked to: "Draw a picture of a person. Draw the very best person you can; not just the head and shoulders, but the whole body". Where children claimed they could not draw, the researcher encouraged them to try and do the best they could. At no time were children pressurised to finish their drawings within specified time limits. If, when scoring, difficulties were encountered regarding interpreting features of the drawing (e.g. establishing sexual identity, or identifying embellishments in the clothing), the appropriate child was consulted, to clarify the queries.

Due to the subjective judgement required to score some items, the researcher sought an independent opinion regarding scoring criteria from the chief clinical psychologist attached to the Child and Family Unit, at the Red Cross Children's Hospital, Cape Town. A selection of 2 drawings from each of the low,

middle and highest scoring groups was examined by the psychologist, together with the researcher. Whilst no inter-scorer reliability co-efficient was calculated, there was a high degree of concurrence regarding the scoring of the 6 drawings examined.

The Goodenough-Harris Test Manual (Harris, 1963) explicitly states that "this Drawing Test does not yield a score that is identical with the IQ derived from a well-administered individual intelligence test" (p. 246); although Harris claims that the correlation between the DAP and an individual intelligence test result is quite substantial, for children between the ages of 5 and 10 years. Anthropologists and psychologists have used this test to gauge the mental development of children for whom no appropriate standardized tests are available; however, the manual warns that such results may to an unknown extent be attenuated by the children's lack of educational experiences. Feuerstein and associates' studies on the cross-cultural dimensions of the human figure drawing (Feuerstein & Richelle, 1957) have queried the concept of the culture-free or educationally unbiased nature of this test.

Klepsch and Logie (1982) maintain that drawings add a dimension not tapped by self-report or observation techniques; that of fantasy and imagination. They believe the drawings provide a rich source of information and can be used as projective material to learn more about children's personalities,

perceptions, values and attitudes. Whilst the DAP was chosen primarily for its nonprojective use, selected qualitative content is reported.

DAP TEST RESULTS (INTELLECTUAL MATURITY)

Goodenough-Harris raw scores were converted to standard score (SS) equivalents using the standardized sample norms, in terms of a mean of 100 and a standard deviation of 15. To enable the researcher to compare all 3 sets of visuographic scores, the DAP SSs were transformed, via a z-score, to the same SS format as the Beery VMI and WISC-R subtests (i.e. a mean of 10 and SD of 3). These results are depicted in Table 4.4.3 [I] (above), and graphically (for each case) in Figure 4.4.3 [A] (also above).

DAP results are somewhat higher than those of the BEERY VMI. The sample mean recorded 8.1; the mode was not unique; the median 7.0; with a maximum SS of 14.0, and a minimum SS of 3.2. The younger children scored higher than the older ones; the boys higher than the girls. In this case the younger girls' scores reflected a greater discrepancy than the older girls'. A detailed analysis of the different scoring profiles of boys and girls is not possible, due to the fact that the test manual scores the male and female body forms differently. No explanation is readily available to explain the sexual differences noted in these scores.

DAP TEST RESULTS (QUALITATIVE CONTENT)

In a factor analytic study of the cognitive component of the HFD Adler (1970) concluded that the figure drawing procedure is essentially a test of the cognitive factor only, and should not be used to evaluate personality development. Whilst the uses of DAP in this research are in line with Adler and Harris' approaches, certain features will be described, to acknowledge the growing body of work related to uses of the HFD other than the assessment of intellectual maturity.

It is generally believed that an human figure drawing (HFD) is an expression of self- or body-image. Logie & Klepsch (1982) report research that maintains that adolescent girls pass through a period of bisexuality when they are less defended than boys, regarding their sexual identity (Schildkrout et al., 1972). In the current sample 7 boys (63.7% of all boys) drew pictures of males; 7 girls (70% of all girls) drew pictures of females; 4 boys (36.4%) drew pictures of females, 3 of whom were in the younger age group; 3 girls (30%) drew pictures of males (Aged 10, 12 & 16 years). The 4 drawings which the researcher considered sexually ambiguous, and whose sexual identity was established by asking the children who drew them, comprised those of the 3 girls who drew pictures of males, and the youngest boy in the sample, who drew a picture of a male. Brown (1979), in a study using 366 children of ages 5-11 years, found that younger boys drew more females, perhaps because of greater

involvement with the mother, whilst girls aged 9 & 10 years drew more males. Klepsch and Logie (1982) cite research that demonstrates considerable variability in children's drawings (Hammer & Kaplan, 1964; Litt & Margoshes, 1966), and urge caution in interpreting opposite-sex drawings as a measure of sexual identification.

An analysis of the relative sizes of the drawings of girls and boys is presented below, from smallest to largest.

RELATIVE SIZES OF DAP DRAWINGS

Drawing size	<1/3 SHEET (<8 CM)	1/3-1/2 SHEET (8 - 12.5 CM)	>1/2 SHEET (>12.5 CM)
No. of Girls:	2	3	5
No. of Boys:	2	3	6

The placement of the drawings on the page related to their relative size. All 4 small drawings were placed towards the top of the sheets of paper; the larger drawings being located closer to the bottom. Only one drawing was too large for the available space, with legs extending to the bottom of the page, and no space for the feet/shoes.

Suns are frequently found on HFDs, and are "often thought to represent dependency feelings in the person who draws it" (Klepsch & Logie, 1982, p. 33). Loney (1971), in examining the drawings of first and sixth graders found more suns in the drawings of girls and younger children. One girl in the current

sample drew a sun (with teeth) as well as a sunflower (with teeth). The sunflowers' roots are portrayed, with the plant apparently "hovering" above the soil. This feature is noted by Feuerstein when he comments on a child's inability to make an abstraction relating to transparent clothes draped over a body, or drawing invisible roots of a tree; "when the child cannot renounce and forego showing them in spite of the fact that he/she never sees the roots" (L.P.A.D. Manual, June 1987, HFD Test, p. 4). The selection of a viewpoint creates a system of reference that determines alternative options between what is, and what is not relevant. The presence of roots, in this case, indicates a limited ability to make the required abstractions consistent with the chosen reference point. When asked about the person drawn in this picture (a girl, smiling, with teeth very evident), the girl (aged 13 years) said she had drawn a princess. One boy drew a soccer player and ball; and one a very lively picture of pop-star Michael Jackson, complete with his microphone. (Refer to the DAP sample drawings included, below.)

According to Koppitz (1966) 5 indicators on children's human figure drawings significantly differentiated aggressive children, viz.: gross asymmetry of limbs, the presence of teeth, long arms, big hands, and genitals. A similar study by Lingren (1971) did not replicate these results. Klepsch and Logie suggest that this is probably due to the differences between Koppitz' sample of children drawn from a clinic population,

whereas Lingren's were not. The author attempted to establish the presence of these 5 features, in the drawings, but found difficulties with the evaluation of "asymmetrical limbs","long" arms and "big" hands. Only 2 boys' drawings had asymmetrical arms. Five (50%) of the girls' drawings had arms connected to the torso below the shoulders. In most cases arms were smaller than a realistic proportional representation, and hands and fingers received scant attention. Klepsch and Logie (1982) state that small arms, or faintly drawn arms, are often drawn by children who fear power, who see themselves as weak and ineffective, and who perceive a lack of personal achievement. Teeth have already been mentioned, in the "Princess" picture; they occur in only one other picture, of a male, drawn by a boy (also included in the sample drawings).

Erasures were more noticeable in girls' drawings than in the boys. Excessive erasing, without improvement to the drawing is related to anxiety and uncertainty. Six of the drawings (28.6%) show evidence of excessive erasing.

Six samples of the children's human figure drawings are included. These have been selected to provide a range of scores. The table below provides information of those children whose drawings were chosen:

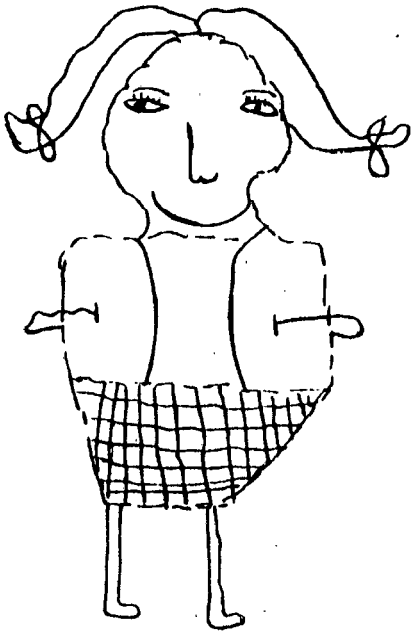
CHILDREN CHOSEN FOR DAP SAMPLES

CASE NO.	SEX	AGE	SS
18	F	15	3.2
14	F	13	6.4
12	M	13	7.0
16	M	13	8.8
11	M	12	13.2
1	M	6	14.0

INTER-CORRELATIONAL DATA

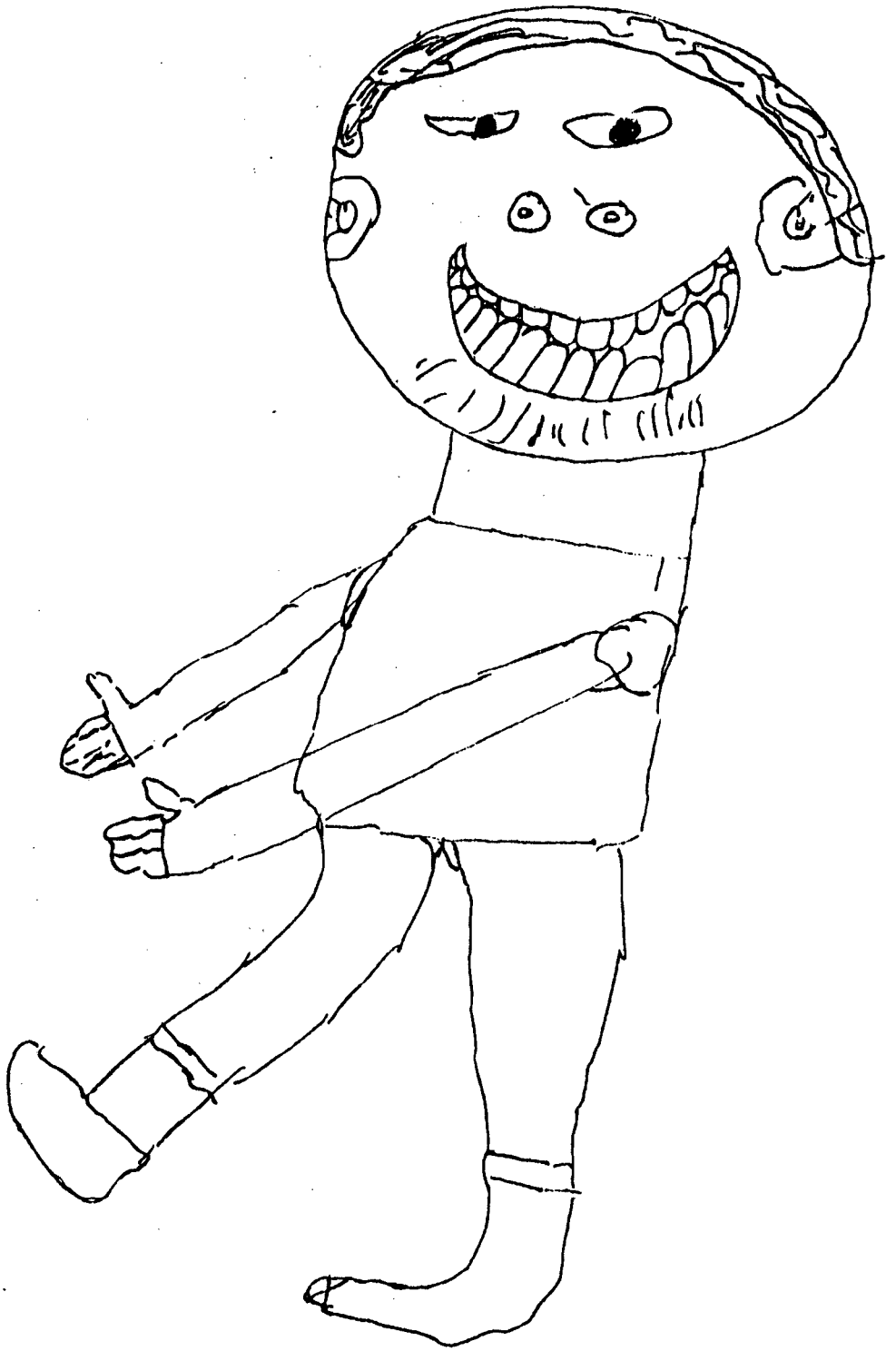
The DAP SSs correlations with SEX of .5672 (boys were coded 1, girls 0) and with AGE of -.5401 are reflected in the results reported in Table 4.4.3 [IV], above. The link with the age the child was admitted again records a negative relationship (AGEADM: r = -.5423). This creates added significance to attributing importance to Feuerstein's theory of mediated learning experiences, and highlights the need to focus on the older children in this sample, if remediation is to be considered as a possible means of assisting the lowest functioning children.

The correlation between the BEERY VMI and the DAP is insignificant (.3580). The only other significant correlation achieved is with the WISC-R Object Assembly (OA) Subtest (r = .4563). An insignificant correlation with the WISC-R FIQ (r = .2593) accentuates the need to see this measure as an estimate of intellectual maturity and NOT of intelligence.

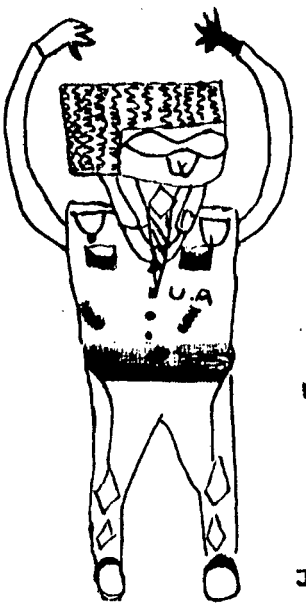


CASE NO: 18 AGE: 15 Yrs SS: 3.2

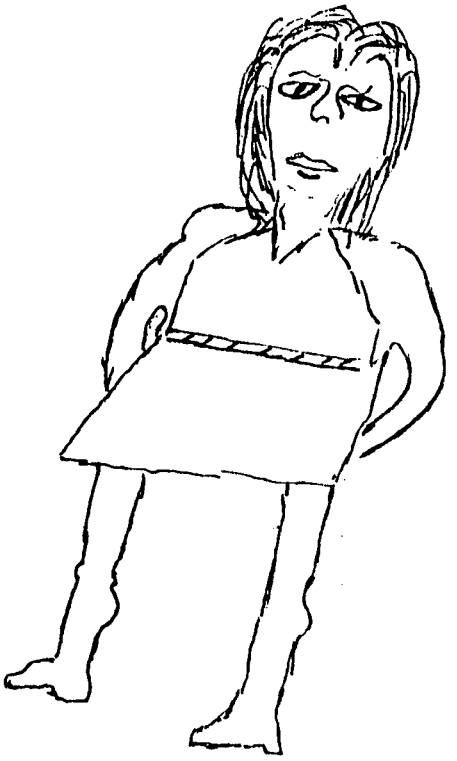
CASE NO: 14 AGE: 13 Yrs SS: 6.4



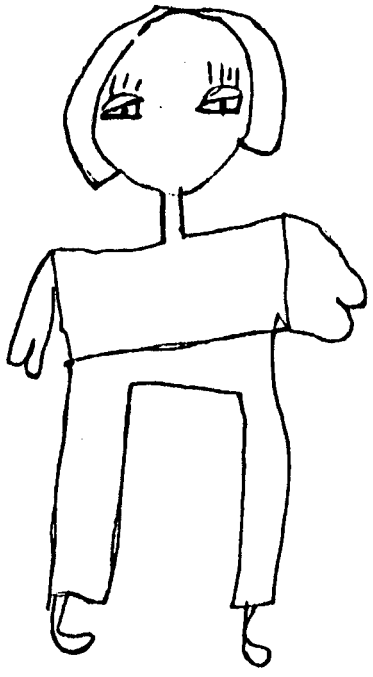
CASE NO: 12 AGE: 13 Yrs SS: 7.0



CASE NO: 16 AGE: 13 Yrs SS: 8.8



CASE NO: 11 AGE: 12 Yrs SS: 13.2



CASE NO: 1 AGE: 6 Yrs SS: 14.0

4.4.3.1.3 THE WISC-R MAZES SUBTEST

INTRODUCTION: DESCRIPTION OF THE TEST

This test is a supplementary performance test of the WISC-R, and was administered as part of the omnibus WISC-R test, although not included in calculation of the WISC-R PIQ.

The test requires a child to draw a pencil line from the centre of a maze, to the "outside"; without crossing any lines, or passing into any blind alleys. The test is timed. Zimmerman and Glasser (1967) state that successful performance requires planning, foresight, attention to instructions and for speed combined with accuracy.

There is no data available on this subtest, due to its infrequent use; however Zimmerman and Glasser (1967) report that although it doesn't contribute much to a measure of general intelligence, it is a useful indicator of perceptual foresight, good visuo-motor co-ordination and good delay of impulsivity.

WISC-R MAZES TEST RESULTS

The results for each child (case) are presented graphically, in Figure 4.4.3 [A], above. An analysis of group means

(grouped according to age and sex) are depicted in Table 4.4.3 [I] above (both inserted in the BEERY VMI Results section). The SSs are recorded with a mean of 10 and standard deviation of 3. The sample mean is 7.8; the median and mode 7; the maximum SS 14; and minimum SS 2. As for the previous measure, the younger children achieved higher scores than the older children; the boys higher than the girls. No grossly uncoordinated children were identified.

Whilst this test does not appear to contribute much to the visuographic component measured, the researcher found individual children reacted very differently in terms of motivation and perseverance in the test situation. Unfortunately no objective measures of these attributes were made, and the impressions thus remain unrecorded.

In general the children responded very well to the test material, and enjoyed the task.

INTER-CORRELATIONAL DATA

There are few significant correlations noted for the Mazes subtest (MZ). The correlation with SEX (r = .5115) reflects the relatively better level of performance of the boys. These differences, noted in the DAP assessment also, remain unexplained.

The correlation of .4768 with the variable "lines left out" (LLO) is significant. LLO measured the number of times a child "skipped" lines during the UCT Speed Reading test, and is an indicator of visual tracking accuracy. This correlation validates to a certain extent Glasser & Zimmerman's (1967) description of what the test measures.

The only 2 correlations that, whilst statistically insignificant, are noticeably higher than the remainder, are those with the WISC-R Picture Arrangement Subtest (r = .3437) and the WISC-R Object Assembly Subtest (r = .3209).

Poor correlations were recorded with the BEERY VMI (r = .1445) and the DAP (r = .2348).

Table 4.4.3 [IV] above, summarises inter-correlational data for the BEERY VMI, DAP & MZ tests.

The location of <u>specific</u> deficient cognitive functions at <u>specific</u> levels of processing, for any <u>one</u> individual, requires intensive investigative work, preferably within a "dynamic" assessment model. Time restraints and the normative requirements of this research curtailed any such individual "dynamic" assessments. However the BEERY VMI test results, in particular, form a rich source of information. The usefulness of this type of integrative material appears to provide a good starting point for further investigations, which should attempt

to isolate deficient functions at specific levels of processing, within particular sensory/motor input and output areas. This type of investigation demands a flexible approach, where the type of test selected is a product of the results of a previous assessment; so that the assessment path is dictated by the results of the assessment process, much like a path within a flow diagram for a computer program. Both Luria (Golden, 1981) and Feuerstein and associates (L.P.A.D. Manual, 1987) advise a strategy that focuses on the flexible application of a test battery comprising simple tests, which focus on specific brain-based behaviours. In Luria's case such a strategy attempts to establish a pattern of errors established by pluripotentiality (i.e. a specific area of the brain which participates in numerous functional systems), whilst Feuerstein and associates locate specific problem areas and attempt to produce changes in corresponding dimensions formulated in a "Cognitive Map". This "map" is a tool which describes the mental act in terms of seven parameters that permit analysis and interpretation of a subject's performance during assessment. The manipulation of these parameters is very important in the examiner-subject interaction in the formation and validation of hypotheses regarding the loci of a subject's difficulties. These seven parameters are briefly listed, since they provide useful signposts which determine particular assessment pathways.

1) The <u>universe of content around which the mental act is centered:</u> Competence is directly related to each subject's

experiential, cultural and educational background. Manipulation of content which is familiar/novel in both assessment and intervention is a source of insight for change.

2) The modality or language in which the mental act is expressed: This may be verbal, pictorial, numerical, figural, symbolic, graphic or any combination of these and other codes. It is important to establish reliability of an ability across modalities; e.g. solving a mathematical operation numerically as well as when the task is communicated verbally.

3) The phase of the mental act: The mental act can be broadly divided into 3 phases, input, elaborational and output. The isolation of the phase (and of the strengths and/or deficiencies of the cognitive functions it contains) helps to locate sources of inadequate responses, and to determine the nature and extent of the mediation needed.

4) The cognitive operations required by the mental act: Essentially part of the elaborative phase, operations provide the rules whereby information is organized, transformed, manipulated, understood and acted upon to generate new information (e.g. identification and comparison, or the more complex analogical reasoning).

5) The Level of complexity: A mental act can be analysed according to the number of units of information up[on which it centers, in conjunction with the degree of novelty or familiarity of the information to the subject.

6) The Level of abstraction: This is defined by the distance between a given mental act and the object or event upon which it

operates (e.g. a task that demands sorting of objects through perception and motor performance represents a lower level of abstraction than one involving relationships of relationships.

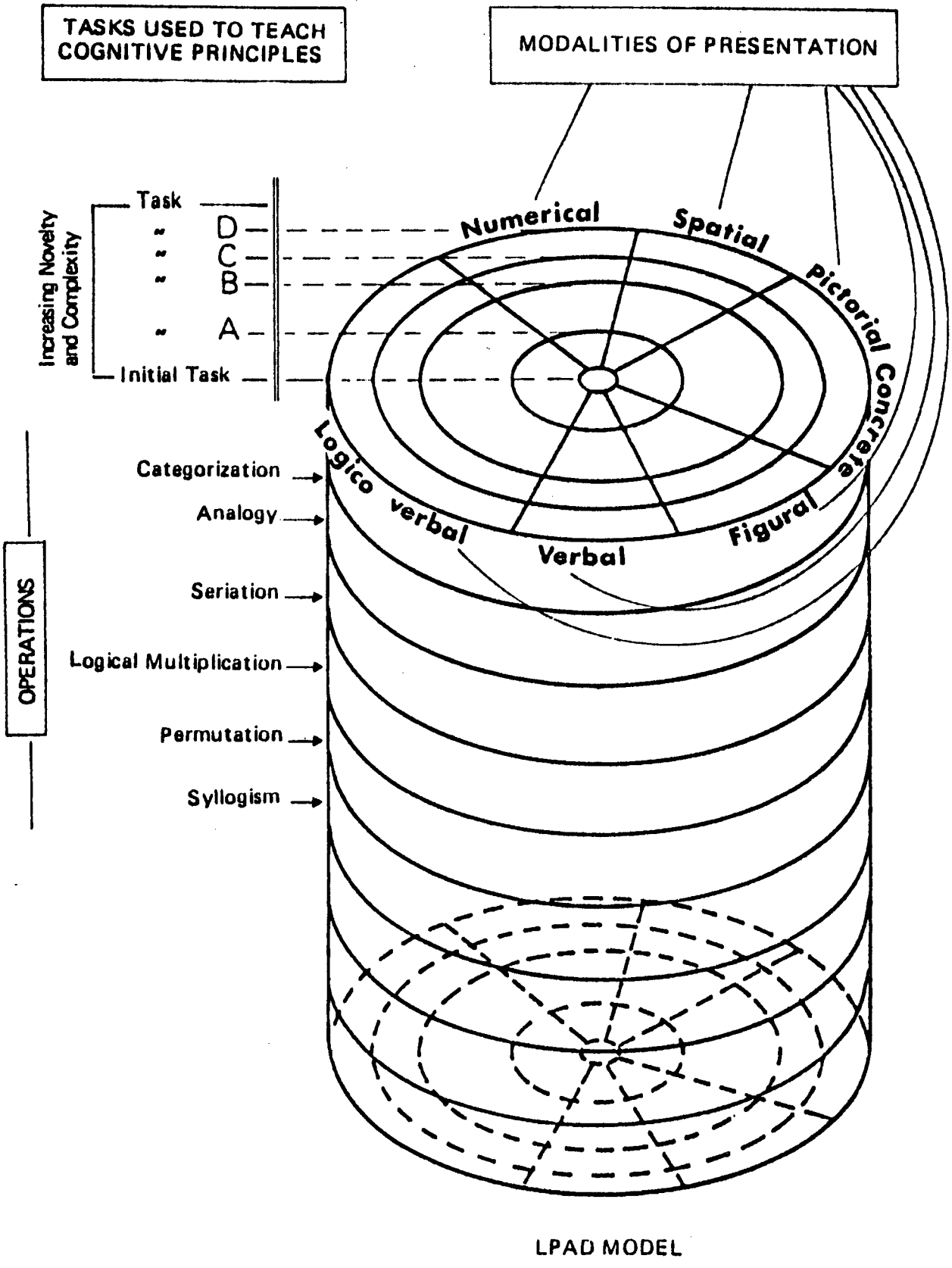
7) The level of efficiency with which a mental act is performed: This is a function of the degree of crystallization of the mental act and the recency of its acquisition. Processes that are recently acquired and not yet automated are more vulnerable and less resistant to a variety of interfering factors. Lack of efficiency may be due to difficulties on one or more of any of the other 6 parameters, as well as a host of physical, environmental, affective and motivational factors which may be transient and fleeting or more pervasive. The authors of the L.P.A.D. manual warn that this is not to be confounded with a subject's capacity, measured in traditional psychometric procedures.

(Feuerstein and associates in Introduction to the L.P.A.D. Manual, 1987; Refer Figure 4.4.3 [C] below for summative diagram of the above.)

The Cognitive Map is used extensively during dynamic assessment; for the construction of materials, in their selection and manipulation during assessment, in mediated learning interventions and in the interpretation of subject's performances. Interpretation of results in this research has largely been confined to the following parameters: the modality or test content; the phases related to the mental acts required by test tasks; and the operations subsumed by these tasks.

FIGURE 4.4.3 [B]

FEUERSTEIN ET AL'S. COGNITIVE MAP



LPAD MODEL

Lack of access to dynamic assessment data inhibits the fluent articulation of Feuerstein et al.'s model in the current research project, but it remains a useful interpretive framework, even when confined to a static assessment paradigm. The significant difference between a static and dynamic data input to this model relates to the fact that static assessment reflects the achievement of the children on a particular test, whereas dynamic assessment would indicate the potential for improvement, given a current level of functioning, and accounting for the subject's responses to mediational aides provided to improve functioning i.e. an indication of the subject's cognitive modifiability.

4.4.4 GENERAL INTELLIGENCE

"The intellectual assessment is designed to assess the highest level of cortical functioning that is symbolic and abstract in nature. It is an index of the child's ability to manipulate both verbal and nonverbal symbols and to reason and solve problems" (Obrzut, 1981, p.258).

In the neuropsychological assessment of school-age children the most widely used and recommended diagnostic instrument is the Wechsler Intelligence Scale for Children-Revised (WISC-R). Obrzut (1981) acknowledges that intelligence tests were not designed to incorporate neurological theory or research, nor to

correspond to known developmental or neuropsychological constructs, yet cites research that admits to their usefulness in investigating issues relevant to subcortical, cortical and hemispheric specialization functioning. It is because the relative performance of the children on the WISC-R subtests provides insights into the children's mode of processing information that the WISC-R was included in the test battery used in this research.

4.4.4.1 THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN - REVISED (WISC-R)

INTRODUCTION: DESCRIPTION OF THE TEST

Wechsler (1974) conceptualised intelligence as "the overall capacity of an individual to understand and cope with the world around him" (p. 5). He qualifies this general definition by adding:

1) Such a definition conceives of intelligence as an overall or global entity; i.e. a multidetermined and multifaceted entity rather than an independent, uniquely-defined trait.

2) It avoids singling out any ability, however esteemed, as crucial or significantly important. In particular, it avoids equating general intelligence with intellectual ability.

The WISC-R consists of 12 "subtests" (6 on the Verbal scale and 6 on the Performance scale). For the purposes of this research the following subtests were used:

(The mnemonics in capital letters following each test will be used in subsequent referrals to them.)

VERBAL		PERFORMANCE	
1. Information	(I)	1. Picture Completion	(PC)
2. Similarities	(S)	2. Picture Arrangement	(PA)
3. Arithmetic	(A)	3. Block Design	(BD)
4. Comprehension	(C)	4. Object Assembly	(OA)
5. Digit Span	(DS)	5. Coding	(CD)
		6. Mazes	(MZ)

The Vocabulary subtest of the verbal scale was omitted, as no equivalent Afrikaans list has been developed. The Mazes subtest was not included in the final estimate of Performance Intelligence, but used independently to assess visuographic skills. It is included here as the inter-test correlations provide interesting information.

Space limitations do not allow for a detailed description of each subtest; the researcher will assume an existing knowledge base regarding these well known psychometric instruments. Only significant features of the childrens' performances as a group will be noted, supplemented by qualitative idiographic descriptions, where necessary.

WISC-R TEST RESULTS

Sattler (1982) recommends that in order to place the myriad different kinds of information obtained from a child's performance on the WISC-R in perspective, it is useful to follow

a successive level approach to test interpretation. This approach assists the development of hypotheses which serve clinical and psycho-educational purposes. The 5 suggested levels of analysis include:

Level I: The Full Scale IQ.

Level II: Verbal and Performance IQs.

Level III: Intersubtest scatter.

Level IV: Intrasubtest scatter.

Level V: Qualitative analysis.

Presentation and interpretation of the results in this research will proceed from Level I through to Level III, including Level V analysis for certain illustrative purposes.

Figure 4.4.4 [A] below, summarises the Full Scale (FIQ), Verbal (VIQ) and Performance (PIQ) scores for each child (case) in the sample. The FIQ, VIQ & PIQ sample means, medians and the minimum and maximum scores are summarised below.

TABLE 4.4.4 [I]

WISC-R ANNIE STARCK SAMPLE STATISTICS

SCORE	FIQ	VIQ	PIQ
MEAN	79	80	81
MEDIAN	79	80	84
MIN.	64	68	63
MAX.	93	91	102

(Normative Sample)

GROUP MEAN	FIQ	VIQ	PIQ
SEMI-SKILLED GROUP	86	87.4	87
UNSKILLED GROUP	81.5	82.6	82.8

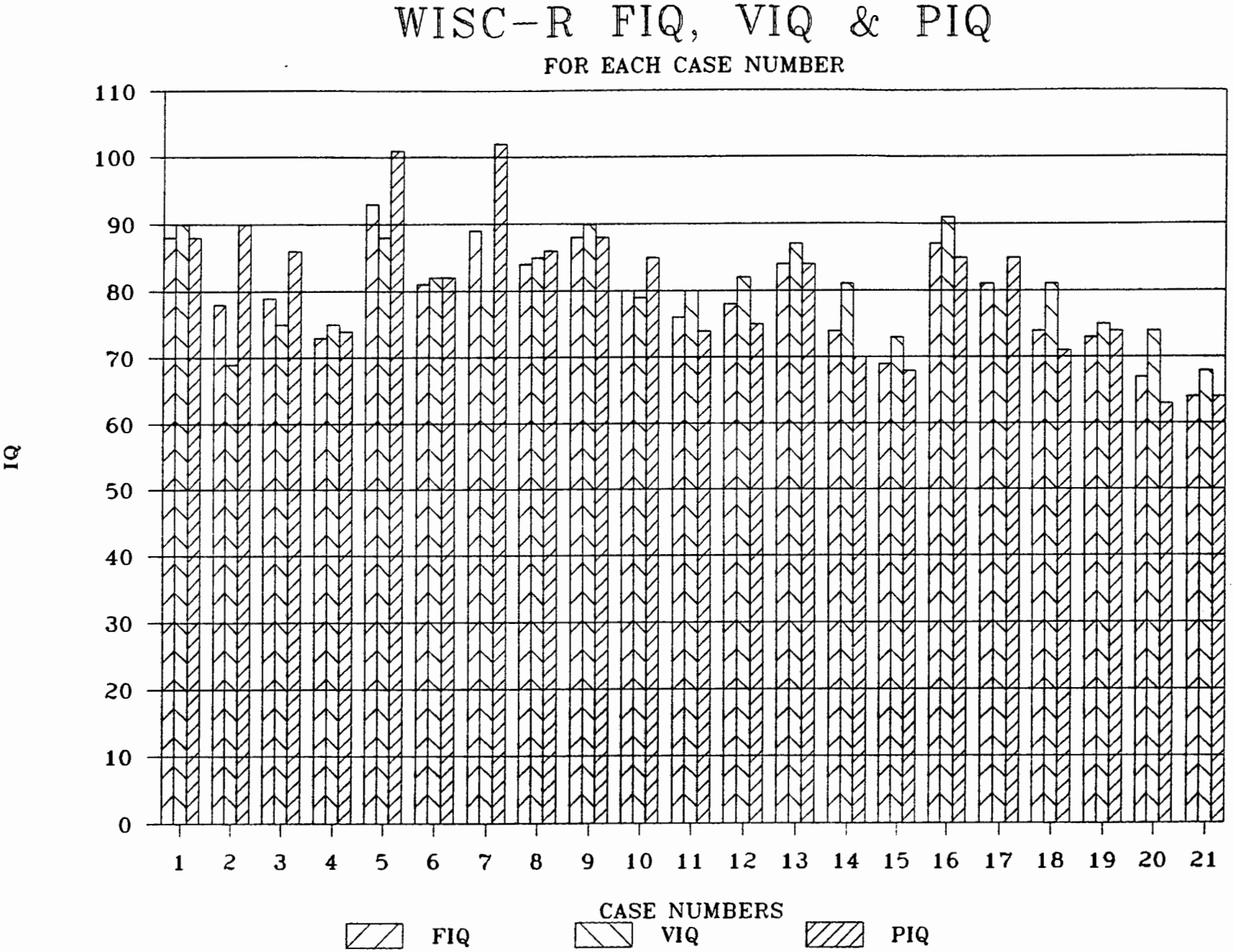

WISC-R FIQ, VIQ & PIQ
FOR EACH CASE NUMBER
IQ
110
100
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
CASE NUMBERS
FIQ
VIQ
PIQ

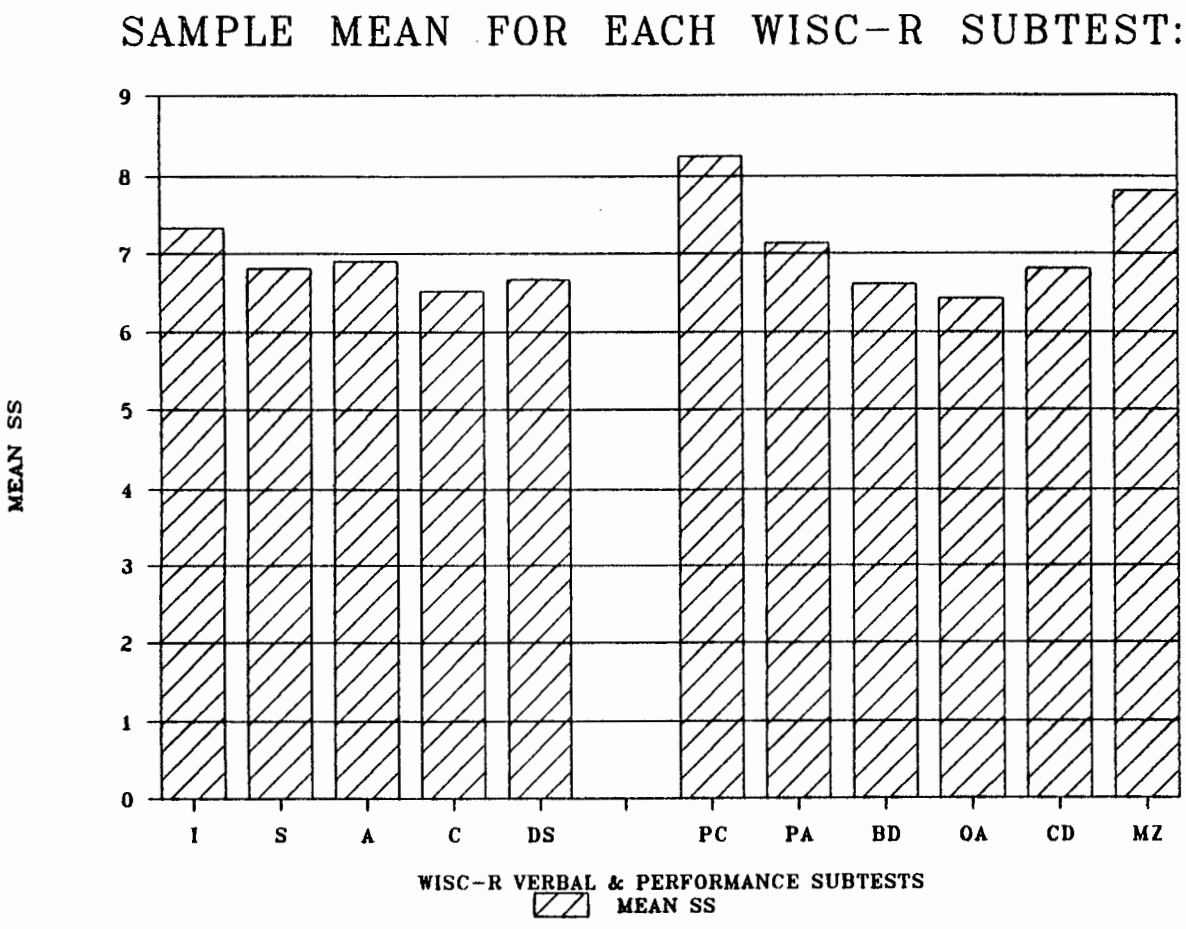
FIGURE 4.4.4 [A]

The Annie Starck sample's scores are lower than those for the lowest socio-economic groups in the standardization sample of the WISC-R, reported in Sattler (1982) following research by Kaufman & Doppelt (1976).

Sattler (1982) states that Verbal-Performance differences may be significant and yet occur with some frequency in the population. It is interesting to note that of the 7 children (33.3%) whose PIQs exceeded their VIQs 3 are siblings, whose differences were marked (13, 21 & 22 points; mean of 18.7); the remaining children obtained differences between 1 and 11 (mean of 5.8). Two of the three siblings referred to recorded the highest FIQs in the sample. In the standardization sample VIQ-PIQ differences were related significantly to parental occupation and to intelligence level. Children of semiskilled and unskilled workers tended to have higher PIQs than VIQs, and more VIQ-PIQ differences were observed in the brighter than in the duller groups.

Acknowledging the fact that assessment of children in this sample is skewed by the bias toward dominant middle-class values inherent in the WISC-R's construction, the author decided that the only meaningful avenue for analysis was to examine the patterns inherent within the sample data. Figure 4.4.4 [B] below, presents a profile of the sample mean scores for each subtest.

FIGURE 4.4.4 [B]



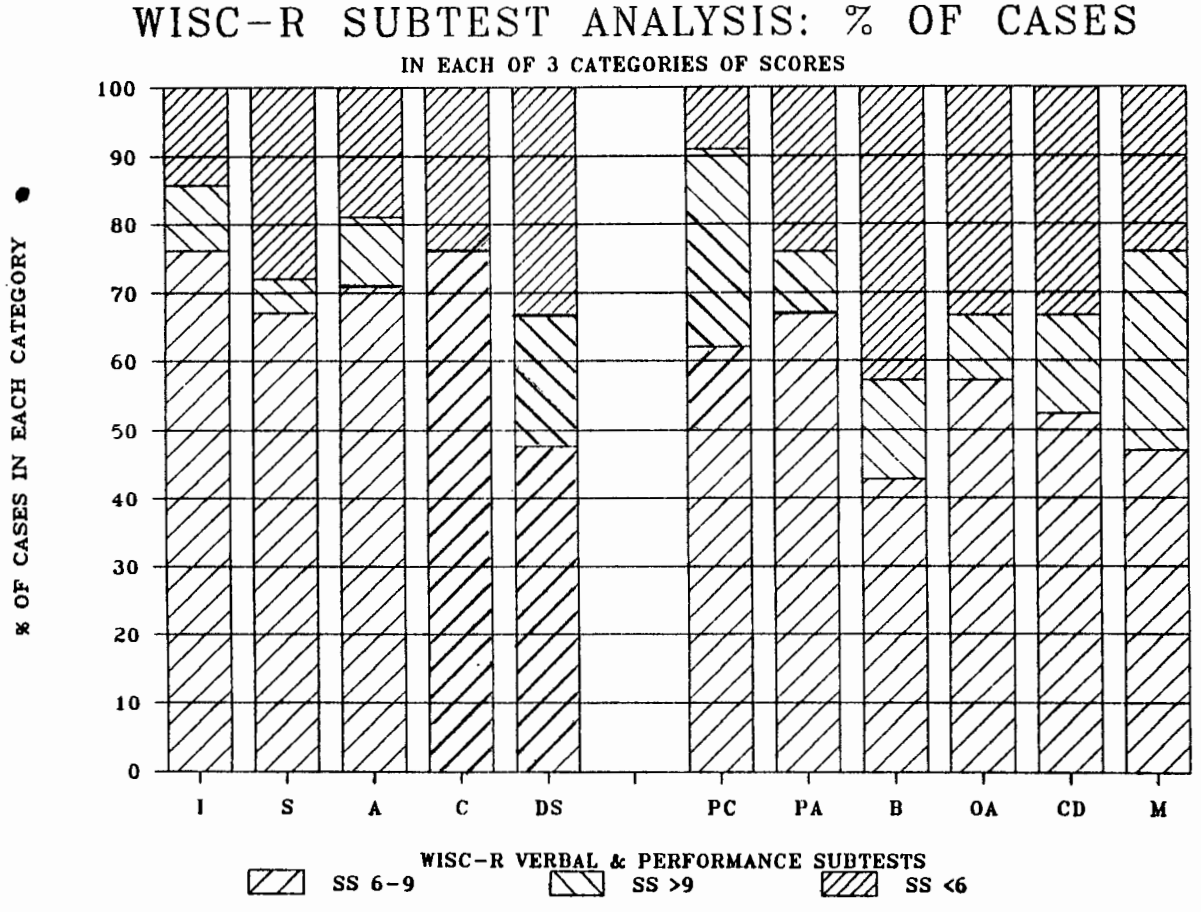


FIGURE 4.4.4 [C]

Figure 4.4.4 [C] above, summarises the percentage of children (cases) who achieved in one of three categories for each Verbal and Performance subtest; viz.:

Category I - representing SS between 6 & 9

Category II - representing SS > 9

Category III - representing SS < 6

Category I includes the greatest proportion of the children in the sample, and therefore represents the expected performance level for children from this sample (ESPL = expected sample performance level); whereas Category II includes all those children performing above the ESPL; and Category III reflects performance levels below the ESPL.

A visual inspection of Figure 4.4.4 [C] draws attention to the fact that relatively more children form Category I groupings in the Verbal subtests. This finding has important implications, for it stresses a prevalence of deficits in those abilities tapped by the Performance subtests, since the balance is redressed in favour of Category III (i.e. sub ESPL) for these subtests. Viewed within the factor analytic research of Kaufman (1975) these results suggest deficit functioning of the "Perceptual Organization factor". This nonverbal factor involving perceptual and organizational dimensions reflects the ability to interpret and organize visually perceived material whilst working against a time limit. The Piagetian model of cognitive development would hypothesize that evidence of such

deficits attests to poor sensorimotor abilities, which form significant foundation stones for the development of formal operations. A retrospective explanation which accounts for the presence of such deficits, is offered by Feuerstein et al.'s (1979) theory of a lack of mediated learning experiences (MLE). The presence/absence of MLE is subsumed by Piaget's reference to opportunities for expression versus forces of inhibition in the ontogenetic adaptation of the human organism. Prospective anticipations regarding future development, based on the correspondence between current WISC-R IQ assessments and scholastic achievement (as measured by the variable SEPTAV), suggests that those children who exhibit marked deficits in the WISC-R Performance subtests will be unable to profit from the opportunities offered within their current educational context, unless remedial programs are offered to assist them develop those prerequisite skills which form the essential foundations for cognitive development.

The in-depth analyses of error responses within the visuographic assessments provided a rich source of evidence of the types of cognitive deficits that characterised the cognitive functioning of those children who achieved low scores. Generalisation of functioning across test situations is possible where the test content is similar. Thus the list of deficient cognitive functions suggested as accountable for the low performance scores on the BEERY VMI test can also be considered as important contributing functions to the poor PIQ profiles.

(Refer to the list of deficient cognitive functions following Table 4.4.3 [III])

Not only do the Verbal & Performance subtests differ with respect to the number of children included in Category I, they also differ when the varying frequencies between those children achieving above, and those below the ESPL is examined (i.e. children included in Categories II & III). If the Verbal subtests are considered as one group, Figure 4.4.4 [C] draws attention to three significant features:

1.) The frequency of children (cases) in Categories I & II is noticeably less for the DS (Digit Span) subtest than for other Verbal subtests. This subtest will be dealt with in detail in the Memory section (4.4.5), but acquires a new significance when viewed in conjunction with a collection of other verbal subtests. Ferinden & Jacobson (1969) refer to the demands made by the DS subtest of the child "to hold attention and the ability to synthesize and organize in a structured situation" (p. 19). Perhaps the lower achievement on the DS is accounted for by the poorly developed ability of many children to attend. This is not exclusively a cognitive factor, but relates to motivational factors as well. In the Motor Parameter it was mentioned that researchers Wolff et al. (1985) hinted at the possible involvement of neural processes (as evidenced in the presence of "mirror movements" in timed sequential and repetitive limb movements) being related to selective

attention. The high incidence of mirror movements "in-excess-for-age" in this sample (referred to in the results section of Denckla's NESS) lends credence to Wolff et al.'s hypothesis, when viewed together with the DS results.

2.) Following DS the S (Similarities) & C (Comprehension) subtests show the next highest proportion of children below the ESPL. Ferinden & Jacobson (1969) suggest that the S subtest measures both abstract and concrete reasoning abilities, involving verbal concept formation, capacity for associative thinking and remote memory (p. 15); whilst C measures the child's use of common sense, judgement and reasoning, requiring that the child draw on past experiences in reaching the solution to common sense problems and situations (p. 7). These subtests both include reasoning abilities, albeit different types. Both have high loadings on the "Verbal Comprehension factor" identified by Kaufman (1975), which links the item content (verbal) to the mental processes underlying performance on the Verbal Scale tests. Ferinden & Jacobson (1969) advise that teaching procedures to assist the development of abstract and concrete reasoning abilities should stress the creation of an awareness in the child of "sameness and differences"; i.e. emphasis should be placed on common elements in class identity and on analogical thinking, starting at a concrete and moving to an abstract level (p. 15). A remediation program of this nature would use as a target the following deficient cognitive functions at the Elaborational level, identified by Feuerstein et al. (1979):

* the inabilitiy to select relevant vs. non-relevant cues in defining a problem;
* the lack of spontaneous comparative behaviour;
* the lack of/impaired need for pursuing logical evidence;
* narrowness of the mental field;
* the non-elaboration of certain cognitive categories because the verbal concepts are not a part of the individual's verbal inventory on a receptive level, or they are not mobilized at the expressive level.

Those teaching procedures suggested by Ferinden & Jacobson (1969) to promote the development of judgement in practical situations relate to the assignment of minor responsibilities to the child, in order to provide experiences for him to proceed on his own, emphasizing questions such as "What to do if ...?" and "why" ? These strategies can be seen to target the following cognitive deficiencies, identified by Feurstein et al.:

* lack of/impaired inferential-hypothetical "iffy" thinking;
* the lack of/impaired strategies for hypothesis testing; and
* the lack of/impaired ability to define the framework necessary for problem-solving behaviour.

3.) The I (Information) subtest ties with Similarities as the second best measure of Spearman's "g", measuring associative thinking and general comprehension of facts which are acquired both in the home and school; the acquisition of these facts being dependant on the child's interest, background, alertness to his surroundings and her overall urge to collect knowledge (Sattler, 1982). This test has high loadings on

Kaufman's (1975) Verbal Comprehension factor. Some examples of the children's responses provide insights about their fund of knowledge, and general awareness of their environment, in particular. Responses to Questions 19 & 27 were selected to provide a sample of the children's knowledge of their physical environment.

Q. 19 asks: "Name two countries that border on South Africa". The following responses were recorded (the age of the child, in years & months - YY:MM - follows the answer):

Cape Town & Cape Province (10:4); Russia & America (11:7); Johannesburg & Durban (11:8); North America & Asia (12:10); Transvaal & Bloemfontein (12:10); Windhoek & Namibia (12:10); London (13:01); Natal & Durban (13:5); Cape Town & George (13:6); Mozambique & Zambia (13:10); Europe & Asia (15:0); Mosselbaai & Johannesburg (15:4); North America & England (16:1); Mauritius & Madagascar (16:5); America & Asia (16:10). Only one child provided a correct answer - Zimbabwe & Swaziland (13:2).

The responses showed a misunderstanding of the term "border" ("grens aan" in Afrikaans), as well as a lack of distinction between the concepts town/city/province/country. These errors are evidence of poorly developed verbal concepts, as well as the non-elaboration of categories. An interesting feature relates to the fact that the older children show a greater degree of consolidation of the separateness of classes, such as countries, provinces and towns. This example demonstrates one aspect of the developing cognitive abilities of children, viz. the ability to categorize information.

Q. 27: "How far is it from Cape Town to Johannesburg?" responses indicated poorly developed systems of reference regarding spatial distances. No child provided the correct answer to this question. The younger children did not attempt to answer the question, due to their inability to answer earlier questions in the list. It is interesting to note how the answers become a more realistic assessment with the increase in age of the children. The following responses were recorded:

AGE	GUESTIMATE	AGE	GUESTIMATE
11:8	10 Km	13:2	200 Km
12:10	10 Km	13:5	12 Km
12:10	One & half hours	15:0	100 Km
12:10	15 Km	15:4	90 Km
13:2	200 Km	16:1	400 Km

Two children (Ages 13:10 & 16:10) answered 1000 Km (very close to the acceptable range of 1120 to 1680 Km). The responses to this question not only indicate a poor ability to conceptualise, in numerical terms, but also poor comparative behaviour. If a child was able to envisage a concrete example from his immediate experience (e.g. the distance from Annie Starck Village to, say, the centre of Cape Town), he could formulate a comparative framework to transcend beyond his immediate experience, and incorporate distances to places he has not visited. The answer to a simple question, such as Q. 27 thus requires a fairly complex problem-solving strategy, moving from a concrete to an abstract reference system. Development of skills in this area could be generated by involving the children in discussions, both when planning outings from the home and when reporting back

following such outings, to create an awareness at the concrete level, of the distances covered.

In the Performance section the following features were noticeable:

1.) On a visual examination of Figure 4.4.4 [C] the BD (Block design) subtest, attracts attention due to the high number of children in Category III. Ferinden & Jacobson (1969) state that this subtest measures the ability to perceive, analyse, synthesize and reproduce abstract designs, relying on non-verbal concept formation, capacity for sustained effort, visual motor coordination, abstract and concrete thinking ability and overall ability to plan and organise. Sattler (1982) states that the BD subtest is the best measure of Spearman's "g" among the PIQ Scale subtests, and also contributes substantially to the Perceptual Organization factor identified by Kaufman (1975).

Of the 9 children who achieved below the ESPL, only one is from the younger group. In fact, of the 10 children comprising the older group, 8 (80%) recorded performances below the ESPL; 1 (10%) obtained the ESPL and 1 (10%) achieved above the ESPL. This feature is captured by the correlation between AGE & BD ($r = -.5903$). The correlation between tasks demanding visual motor skills and age has been noted before, in the visuographic assessment section. There is a general tendency for older children in this sample to perform poorly over a range of

performance subtests, as indicated by the overall correlation between AGE & PIQ ($r = -.5975$). What is surprising is that all of these children have progressed through the school system thus far without any hint of detection of sensorimotor and especially visual perceptual defects.

The child who achieved a BD SS = 1 (Case No. 19; Age 16:1), is a case in point. He was unable to solve design #3, and also failed designs #1 & #2. Any strategy he attempted was confounded by his inability to focus on the top face of the block, as the source of information. He kept on looking at the sides. The researcher assisted him by using a flat piece of paper to cover 2 blocks (for the 2 x 2 designs), and thus focus his effort on reproducing 2 blocks at a time, using the visible top surface pattern. Once these guidelines had been given, he was able to solve design #4, exceeding the time limit, but progressed to solving designs #5 & #6 well within the time limit. The researcher continued with the test, despite the failures, to observe his method of working. He indicated that certain designs were correctly completed, which were in fact wrong. This suggested evidence of confusion with orientation and direction. Lastly, his attempts at design #9 were characteristic of most of the children in the sample, who continued to use a 2-block line to reproduce a 3 x 3 block design, showing evidence of lack of flexibility in discarding an unsuccessful strategy, when presented with a slightly different problem. This child's arrangement of pictures in the PA subtest

from right to left (i.e. the reverse order to that normally used) also suggested evidence of confusion with direction / orientation.

2.) Figure 4.4.4 [C], above, shows both the OA (Object Assembly) & CD (Coding) subtests also included a higher proportion of children below the ESPL. Ferinden & Jacobson (1969) state that the OA subtest measures visual-motor coordination, assembly skills, the ability to see spatial relationships and to synthesize concrete parts into meaningful wholes; whilst the CD subtest measures general overall psycho-motor ability, but more specifically flexibility in new learning situations and ability to learn visual-motor skills from repetitive experiences. The correlation between AGE & OA is significant ($r = -.4557$), confirming the evidence of poorer perceptual organisational abilities in the older children, and linking the OA & BD subtests by way of their loading on Kaufman's "Perceptual Organisation factor". The DS & CD subtests when combined relate to Kaufman's (1975) "Freedom from Distractibility factor"; a measure of the ability to attend or concentrate. Thus the "distractibility" factor occurs in both the Verbal and the Performance subtests.

Mention should be made of one child whose performance profile presented problems. He (Case No. 12; Age 13:1) recorded an unusually low SS (2) for the CD subtest. The researcher was concerned about the validity of this score, and re-administered

the test. The resulting raw score of 29 was 4 higher than the original raw score. Allowing for a practice effect, the original score was accepted as a fair representation of the child's ability. The fact that this score provides an uncharacteristic "dip" in the child's profile is readily seen when viewed against other scores in the battery, especially those incorporating visuo-motoric skills (depicted below). The fine motor skills of the child, as measured by his performance on the Purdue pegboard, showed that he performed at 113.33% for his right (preferred) hand, 107.14% for his left (non-preferred) hand, and 100% for both hands (reported as % achieved of the equivalent normative age expectancy). Thus there appeared to be no problems with motoric skills. The fact that all the symbols attempted were correctly drawn rules out the possibility of perceptual problems (the only mark lost was due to leaving out a symbol, whilst completing the task). The only other available information that might account for the "dip" relates to problems mentioned to the researcher, by child care workers who worked with the child, relating to his "sniffing" of glue and the contents of aerosole cannisters, such as "Doom". Evidence of this nature requires further investigation, but does suggest avenues for future research, for the author was unable to find reference to studies which specifically addressed this topic in the literature. The child's poor performance on the Auditory Discrimination task as well suggests a specific deficit relating to the elaboration of comparisons. Estes' (1974) research suggests that a verbal-encoding process forms a major component

of the CD subtest. This finding strengthens the hypothetical account of the low performance suggested above.

CASE NO. 12: ASSESSMENT PROFILE

I	8	PC	7	UCT GRT	10.14
S	8	PA	5	UCT SRT	6.48
A	8	B	10	UCT SPELL	7.16
C	7	OA	8	BEERY VMI	8
DS	5	CD	2	DAP	7
		MZ	7	ADISC	-4

BENVR TEST Category 4 (Sub-normal)

INTER-CORRELATIONAL RESULTS

Much has been written of the usefulness or otherwise of "intelligence tests". Frank (1983) draws on a large body of research data to substantiate his argument that "the Wechsler tests are like the dinosaur, too large, cumbersome and illfitted and awkward in the age in which they developed, unable to remain viable in a psychometric age which has passed it by in conceptualization" (p. 126). Whilst the "static" paradigm employed by the Wechsler test does deny access to important process information, it can hardly be said that the information gleaned in the analysis above can be completely discounted. Surely, if a practitioner acknowledges the limitations of the Wechsler as originally conceptualised (and there are indeed many), but employs the instrument in a flexible manner, incorporating essential process information, it can provide a useful data source?

The WISC-R inter-correlational data between subtests is reproduced in Table 4.4.4 [II], below. Those subtests recording the 3 highest correlations were:

BD & OA (r = .71); PC & PA (r = .66); and I & PC (r = .65).

The three lowest correlations were:

S & DS (r = -.16); C & DS (r = -.14); and OA & DS (r = -.14).

Unlike the standardization sample data where the Verbal Scale subtests were more highly inter-correlated than the Performance Scale subtests, this sample showed the reverse trend. The Verbal subtest inter-correlational mean was .147; the Performance .384.

TABLE 4.4.4 [II]

WISC-R SUBTEST INTER-CORRELATIONS

	FIQ	VIQ	PIQ	I	S	A	C	DS	PC	PA	BD	OA	CD
VIQ	.80	*	*	*	*	*	*	*	*	*	*	*	*
PIQ	.91	.49	*	*	*	*	*	*	*	*	*	*	*
I	.80	.76	.66	*	*	*	*	*	*	*	*	*	*
S	.33	.56	.10	.25	*	*	*	*	*	*	*	*	*
A	.39	.55	.18	.28	.21	*	*	*	*	*	*	*	*
C	.54	.41	.50	.16	.31	-.05	*	*	*	*	*	*	*
DS	.26	.47	.06	.40	-.16	.21	-.14	*	*	*	*	*	*
PC	.82	.60	.79	.65	.23	.25	.58	.12	*	*	*	*	*
PA	.83	.62	.80	.61	.19	.02	.54	.22	.66	*	*	*	*
BD	.60	.20	.71	.38	-.02	-.04	.27	.01	.54	.41	*	*	*
OA	.48	.08	.64	.28	.01	.22	.24	-.14	.34	.31	.71	*	*
CD	.52	.38	.53	.45	-.09	.14	.16	.28	.40	.52	.00	-.05	*
MZ	.29	.20	.30	.23	.24	-.14	-.10	-.01	-.01	.34	.22	.32	.02

Those correlations with other assessment measures that achieve statistical significance are noted in Table 4.4.4 [III], below.

TABLE 4.4.4 [III]

WISC-R TEST INTER-CORRELATIONS

VARIABLE	FIQ	VIQ	PIQ
BEERY VMI	.53	.27	.57
BENVR	.48	.25	.53
SEPTAV	.43	.21	.46
P/F	.67	.49	.64
AGEADMT	-.63	-.21	-.75
NO SCHLS	-.39	-.06	-.51

The only correlation that achieved statistical significance for the VIQ measures in Table 4.4.4 [III] above is that with P/F (the pass/fail criterion for the September term aggregate). Only two other significant correlations are not included in Table 4.4.4 [III]. They are :

i) VIQ & the UCT SRT (r = .4342) and

ii) FIQ & Hand (r = -.4343; where left hand dominance was recorded as 1).

The latter correlation is not accepted as a significant correlation for interpretive purposes, since there are only 2 children with "adverse dominance" in the sample.

The FIQ & PIQ correlational data record surprisingly similar correlations, differing marginally. This is a significant finding, for it suggests that for this sample of children a large amount of the variance in both the FIQ & SEPTAV can be attributed to the variance in the PIQ. Acknowledging the limitations of correlational studies, where cause-effect

relationships cannot be deduced, the significant contribution of the PIQ variance nevertheless does suggest that those skills assessed in the PIQ battery (comprising the Perceptual Organization factor suggested by Kaufman, 1975) do contribute to scholastic achievement. Alternatively, it appears that those deficits which account for poor performance on the PIQ also account for scholastic failure.

It is the opinion of the researcher that whilst the "verbal environment" of children such as those comprising this sample is largely determined by the social context, much can be done to improve those skills which are tapped by the PIQ subtests. The results of the current research suggest that given an information processing paradigm, the Input processing level and its attendant possible deficits expounded by Feuerstein et al. (1979) require significant attention; particularly the development of basic visual perceptual skills, not previously acquired either from the immediate "home", nor from the school environments.

The significant moderate correlation between AGEADMT & both FIQ & PIQ, attests again to the relevance of Feuerstein's concept of "mediated learning experiences", and suggests that those children admitted at an earlier age achieve better on the PIQ subtests, in particular. The evidence shows that those children admitted at an older age exhibit visual-perceptual deficits which permeate a host of cognitive and probably also

motivational problems. Within the Feuersteinian model the older children's lack of / limited exposure to "mediated learning experiences" appears to have left its mark specifically in the perceptual-organisational area.

The significant correlations between FIQ, PIQ & BEERY VMI confirms Gaddes' (1981) contention that sensorimotor integration is essential for the development of normal learning; that between FIQ, PIQ & BENVR validates the need to include memory assessment within the integrative parameter, and re-iterates the significant contribution of visual-perceptual processing.

4.4.5 MEMORY

Memory is not a discrete entity which an individual does or does not possess; but rather a function of many processes (such as the ability to attend, to concentrate and integrate experiences) within different modalities (e.g. visual, auditory, kinesthetic and rote). Logue (1970) states that whilst a child may have first-class rote memory for digits or sentences, she may be unable to retell a story; and that although some pupils can remember well if asked for immediate recall, they retain very little only half an hour later. Much has still to be learned about memory functioning and assessment, but for the purposes of this project a standardized visual and auditory assessment was used.

4.4.5.1 VISUAL MEMORY

Little appears in the literature on the significance of visual memory assessment in relation to scholastic performance; and yet an increasing interest has been devoted to immediate memory assessment in the clinical neuropsychological arena. Valett (1967) included activities to develop facility in the accurate recall of prior visual experiences, in his own composite remedial program. The popularity of the auditory-vocal digit span test, devised in 1887 by Jacobs, led Benton (1945) to design and develop a "memory for designs" test, to be used to tap the visual component of immediate memory function.

4.4.5.1.1 BENTON VISUAL RETENTION TEST

INTRODUCTION: DESCRIPTION OF THE TEST

Benton's initial investigations resulted in the development of a short test for adults that involved sensorimotor components operating on test material of a nonsymbolic nature i.e. abstract designs. A close correlation between intelligence level and performance on the BENVR test was reported (Benton, 1945). The success of the initial study led to an investigation of the performances of school children on the visual retention test, to determine whether the difficulty range could be utilized clinically with children. These preliminary observations of 245 school children, aged 8 to 16 years, indicated that the test was not too difficult. In addition, deviant performances suggested that failure on the test might be related to clinically and educationally significant behavioural deviations. Normative standards of performance for the different age levels were developed on the basis of the standardization data. A further refinement was made, when a multiple-choice format replaced the original graphic-motor response format.

The test comprised 2 Forms (A & B); each Form comprising 7 items. The test items were made by the researcher, using the formats provided in Benton's (1950) article (refer Appendix I Annexure F). Each test item was drawn in the middle of a white sheet of paper (21 x 15 cm) and assumed maximum dimensions of

4.5 x 4.5 cms. The 4 options for the subsequent multiple choice were reproduced on the same sized paper, divided into 4 quadrants, with the appropriate shape drawn in each quadrant. The dimensions of each shape (2.75 x 2.75 cm) were reduced slightly to fit into the available quadrant. The administration procedure involved showing the child a design for 10 seconds, during which time he/she was told to study it carefully. The card was then removed, and the child shown one with 4 designs, one of which was identical to the original design shown. The child was asked to point to, or name (quadrant 1/2/3/4), which design was identical to that shown to her/him. Form A was always presented first, followed by Form B.

Spreen (1978), in a 6-year follow-up study covering the period from kindergarten to the end of grade 5, found that prediction of performance on criterion measures that included achievement tests in reading, writing, arithmetic, science and social studies, was maintained on the basis of two tests from a battery of 4; the Peabody Picture Vocabulary Test and the BENVR Test (copying form).

BENTON VISUAL RETENTION TEST RESULTS

The test results are depicted in Table 4.4.5 [I], below. To interpret scores using the normative data tables (Benton, 1949) the average of Form A & B scores was calculated. This mean score was used to establish an appropriate performance category,

as per the descriptions provided by Benton (1950). Difficulties were encountered with the 2 youngest children (aged 6 & 7 years), who were below the floor age of this descriptive table. A conservative solution placed the 7 year old in the 8 year old category; and extrapolated the 6 year old's normative standing from the 8 year old category, by dropping each number of correct items one category.

TABLE 4.4.5 [I]

BENTON VISUAL RETENTION TEST RESULTS

GROUP DESCRIPTION	NO IN GROUP	BENVR TEST CATEGORY 1	2	3	4	5	6	7
Entire sample	21	5	1	4	6	1	3	1
Boys	11	2	1	1	4	1	2	0
Girls	10	3	0	3	2	0	1	1
Children <13 yrs	11	2	1	3	0	1	3	1
Children >12 yrs	10	3	0	1	6	0	0	0
Boys <13 yrs	6	1	1	1	0	1	2	0
Girls <13 yrs	5	1	0	2	0	0	1	1
Boys >12 yrs	5	1	0	0	4	0	0	0
Girls >12 yrs	5	2	0	1	2	0	0	0

LEGEND: INTERPRETATION OF CATEGORIES

Category	Description
1	Defective
2	Sub-Normal
3	Low Average
4	Average
5	High Average
6	Superior
7	Very Superior

A similar route was followed, to that pursued in the analysis of lowest functioning profiles for the BEERY VMI Test. Those children who attained categories 1 or 2 (Defective or Sub-Normal) for the BENVR Test were selected, to investigate their incorrect responses. Table 4.4.5 [I] above shows that these 6 children, comprised 3 from the older and 3 from the younger groups. An interesting feature of these 6 children is the close association between their scores and the Pass/Fail indicator. 5 of these 6 children (83.3%) failed to pass their September term average, accounting for 71.4% of the 7 who failed. The remaining child of these 6 children passed, but proved extremely uncooperative during assessments and, in the opinion of the researcher, showed evidence of inappropriate affect on numerous occasions. Those 2 children who failed the September term average but are excluded from the selected group of 6 lowest functioning on the BENVR Test achieved Categories 3 & 4 for this test. The moderate correlation between BENVR & P/F of .6305 captures this association. Evidence such as this confirms the diagnostic validity of the BENVR Test; its value in locating both cognitive and affective areas for concern; and emphasises the significant contribution of visual processing functions in the school environment.

The total number of correct responses on both Form A & Form B, for these 6 children showed a significant difference, viz.: Form A = 11 correct; Form B = 20 correct. This variation is in part attributable to the fact that Form A was always presented

first; Form B second. Assuming the difficulty level of both Forms is the same, the difference in the children's performance between Form A & Form B could well represent a child's ability to profit from experience/practice, on the later items. In this case the difference between the two scores would in fact represent an index of responsiveness to a learning situation. Such an approach to assessment procedures was suggested as far back as 1934 by Andre Rey, who recommended abandoning the study of developed capacities, "in favor of investigating processes of development and modification of adaptational and intellectual capacities" (Feuerstein et al., 1979, p. 50).

Haeussermann (1958), Schucman (1968), Budoff (1968, 1973), Budoff & Hamilton (1976), Clarke, Clarke & Cooper (1970), Rohwer & Ammons (1971) and Haywood et al., (1975) (cited in Feuerstein et al., 1979, p. 54) have all contributed to, and provided demonstrations showing the effectiveness of a new philosophy of assessing cognitive potential, which operates in a dynamic training-assessment system that can provide a valid and prescriptively helpful estimate of the cognitive potential of the low functioning disadvantaged child. This approach, whilst not actively employed in the administration of the BENVR Test, was embedded in the administrative procedures, and provides a useful framework for the interpretation of the observed variations between Form A & B scores.

A feature of the differences recorded between Forms A & B, for the 6 selected children, is the discrepancy between the younger

and older age groups, as reflected in Table 4.4.5 [II], below. An interpretation within the parameters of the dynamic assessment model hints at the "submerged potential" evident in the older children, which is not reflected in the static assessment measures, and is suggestive of a degree of modifiability not otherwise detected.

TABLE 4.4.5 [II]

BENVR TEST ANALYSIS OF RESPONSES OF CHILDREN IN CATEGORIES 1 & 2

CASE NO	FORM A NO. CORRECT	FORM B NO. CORRECT	DIFFERENCE (A-B)
(YOUNGER GROUP)			
3	0	0	0
10	2	3	-1
11	4	4	0
TOTAL	6	7	-1
(OLDER GROUP)			
15	2	4	-2
19	2	4	-2
20	1	5	-4
TOTAL	5	13	-8

NOTE: TOTAL = Total correct

An analysis of the 6 selected children's error responses produced 6 possible criteria for failure, viz.:

i) incorrect number of sides of a shape

ii) incorrect orientation of the shape

iii) incorrect position of the shape (i.e. relative to the base)

iv) incorrect form / outline of the shape

v) missing elements

vi) incorrect sequence of shapes (where more than one shape was present)

Nine items were selected for analysis (Items 1,2,5,6 & 7 from Form A and 2,3,4 & 7 from Form B) due to consistently incorrect answers for them. The answers selected by each child were analysed in terms of the 6 criteria for failure listed above. The pooled occurrences of failure criteria across items indicated that:

i) 4 items featured <u>incorrect orientation</u> as the most common reason for failure;

ii) 2 items featured <u>incorrect form</u> as the most common reason for failure;

iii) the remaining 3 items featured <u>incorrect position of the shape</u> for one item, <u>incorrect number of sides</u> for one, and a combined <u>incorrect sequence & orientation</u> of the shape for the last item.

These criteria are illustrative of deficient cognitive functions operating specifically at the Input level. Evidence of blurred

and sweeping perception, and the lack of / deficient need for accuracy in data gathering were particularly noticeable when children indicated to the researcher that they had satisfactorily explored a design, and wished the card to be removed, before the 10 second time exposure had elapsed.

INTER-CORRELATIONAL DATA

The correlation between the BEERY VMI & BENVR is significant, but low (r = .5718). This correlation probably reflects the considerable overlay of visual processing functions tapped by both tests at the Input and Elaborational levels. The BEERY VMI's graphic response measures processing at the output level as well, which is excluded from the Benton's multiple choice answer format. To the extent that these measures both share visual processing factors, the presence of deficient cognitive functions noted in the analysis of low functioning profiles in the BEERY VMI Test, would also affect performance on the BENVR Test.

The lack of/impaired receptive verbal tools, was particularly noticeable with a number of children (especially the younger ones), who verbalised their concern in the test situation that they didn't know the names of the forms/shapes. This may provide clues for the type of strategy employed when "memorizing" a shape, and suggests that the children expressed concern when unable to memorise a word, rather than the shape itself.

What appears as an interesting phenomenon is the shared relationship between both these scores (BEERY VMI and BENVR), and the variable YRSPSK. The correlations suggest that for this sample 24% of the variance in the BEERY VMI score, and 28% of variance in the BENVR score can be attributable to time spent at pre-school. The recurrent pattern of those children admitted at an earlier age performing better, is reflected in the correlation with AGEADM ($r = -.5325$).

Benton (1949) originally noted that comparison of the performances of the same children on the BENVR Test and Goodenough "draw a man" test suggest the use of both tests with children suspected of having brain injury, to assist in the detection of damage, and establish the extent of the damage. The current sample was not selected to specifically identify evidence of organic brain injury, but the absence of any correlation with DAP scores ($r = .0032$) suggests the limitations of using these 2 tests with children from culturally deprived environments. This caveat is particularly relevant when the analysis remains at an examination of the final test scores; where the unit of analysis is the <u>product</u> and not the <u>process</u>.

The significant correlations between the BENVR Test & WISC-R scores are listed below, for interest.

VARIABLE	BENVR TEST
WISC-R PIQ	.5270
WISC-R FIQ	.4805
PA	.6032
OA	.5298
BD	.4744

NOTE: PA = Picture Arrangement; OA = Object Assembly; BD = Block Design

4.4.5.2 AUDITORY MEMORY

Glasser and Zimmerman (1967) state that remote memory is one of those abilities of which a certain absolute minimum is required for all levels of intellectual functioning. In focusing on auditory memory function Aaron (1981) draws attention to the fact that "no test is 'pure' or capable of accurately assessing a single psychological ability or disability" (p. 317). He cites the WISC-R Digit Span (DS) subtest as an example, which although generally considered to be a test of sequential memory ability may produce a score reflecting the subject's poor memory for sequences or a short attention span. Wechsler (1939) states that the psychological factor involved in the Digit Span is that of "retentiveness", but acknowledges that low performance is frequently associated with attention defects. Frank (1983) reports that both Wechsler and Rapaport thought the memory for Digits not so much a test of memory, but of attention; the impairment of which would reflect anxiety. Cohen's (1952)

findings that the WISC Digits and Arithmetic subtests seem to form a factor of "ease of distractability" are replicated by the "Freedom from Distractibility" factor shared by the Arithmetic, Digit Span and Coding subtests, identified by Kaufman (1975). Kaufman's factor measures the ability to remain undistracted, but also may involve numerical ability. Short-term memory may be an important component of this factor, but it is not certain to what extent this is so. Thus research evidence is unclear whether attention, concentration, or some other variable is involved in performance on the Digit Span subtest.

4.4.5.2.1 THE WISC-R DIGIT SPAN SUBTEST

INTRODUCTION: DESCRIPTION OF THE TEST

The WISC-R Digit Span (DS) subtest comprises two different tests, Digits Forward (DF) and Digits Backwards (DB), each of which involves different mental abilities. Both tests comprise 7 pairs of random number sequences which are read to the child. The DF requires the child to repeat each sequence exactly as it is given; for DB the child is asked to repeat the digits in a reverse order.

Lezak (1983) maintains that the combined scores (DF+DB), used to obtain the subtest scaled score, results in a loss of valuable information; that for neuropsychological purposes the digit span forward and the digit span backwards need no further

elaboration. Glasser and Zimmerman (1967) state that poor performance could be affected by anxiety and indicate an inability to maintain self control of mental operations.

The DF test has been aptly described as a test of "the passive span of apprehension" (Hayslip and Kennelly, 1980). By contrast DB requires the storing of a string of data briefly, whilst manipulating them around mentally, demanding active use of working memory. Sattler (1982) states that a good score for DB may indicate flexibility, good tolerance for stress and excellent concentration. Lezak (1983) points out that DB involves simultaneous parallel mental operations including memory and reversing operations. She considers the DB subtest to be generally sensitive to brain damage and that individuals with visual field defects perform poorly. DB has been shown to have higher loadings on "g" than DF (Jensen & Osborne, 1979).

WISC-R DIGIT SPAN RESULTS

Bearing in mind the criticisms above, the DF and DB results will be considered separately and attention paid to the differences between these two scores.

Figure 4.4.5 [A] below shows differences between the chronological age and age equivalent attained for each case. The age equivalent figures were derived from an unpublished table, drawn up and used by researchers attached to the "Brain Injury in Children" Research project, at Groote Schuur Hospital,

Cape Town, for interpretative purposes (Hemp et al., 1984). The following extracts indicate the source of data included in the figure:

TABLE 4.4.5 [III]

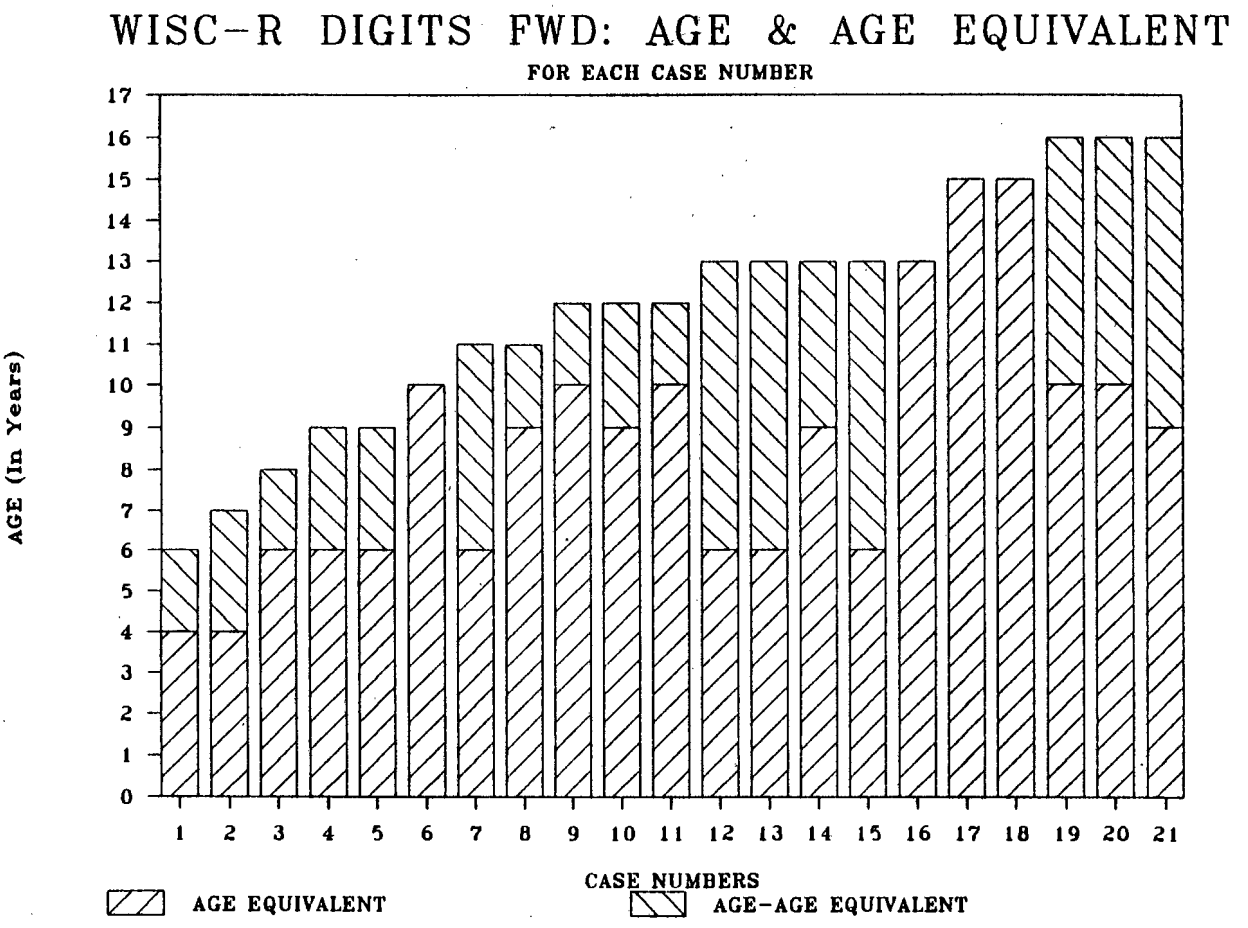
AGE EQUIVALENT PERFORMANCE LEVELS FOR WISC-R DF

NO. OF DIGITS	AGE EQUIVALENT	EXTRACTED FROM
3	4	JSAIS
4	6	JSAIS
5	8	JSAIS
6	10	Best expected for S-B
7	C.A	(Arbitary ceiling)
8	C.A	(Arbitary ceiling)
9	C.A	(Arbitary ceiling)

LEGEND: AGE EQUIVALENT is given in years
C.A. is chronological age
JSAIS is Junior South African Individual Scale
S-B is Stanford-Binet
Arbitrary ceiling indicates that literary references did not cover these numbers, and therefore a decision was made to establish an arbitrary ceiling

Only 4 children in the sample achieved at the correct level for their chronological age; 1 from the younger, and 3 from the older age groups. The mean difference between the age and age equivalent for the younger children is 2.5 years. For the older children this difference is much greater (reflected in the range of 4 to 7 years), and partially reflects their ages relative to the arbitrary ceilings in the table above, but also their depressed scores. This test probably reflects the low frustration tolerance of the children for a task involving a minimum of difficulty.

FIGURE 4.4.5 [A]



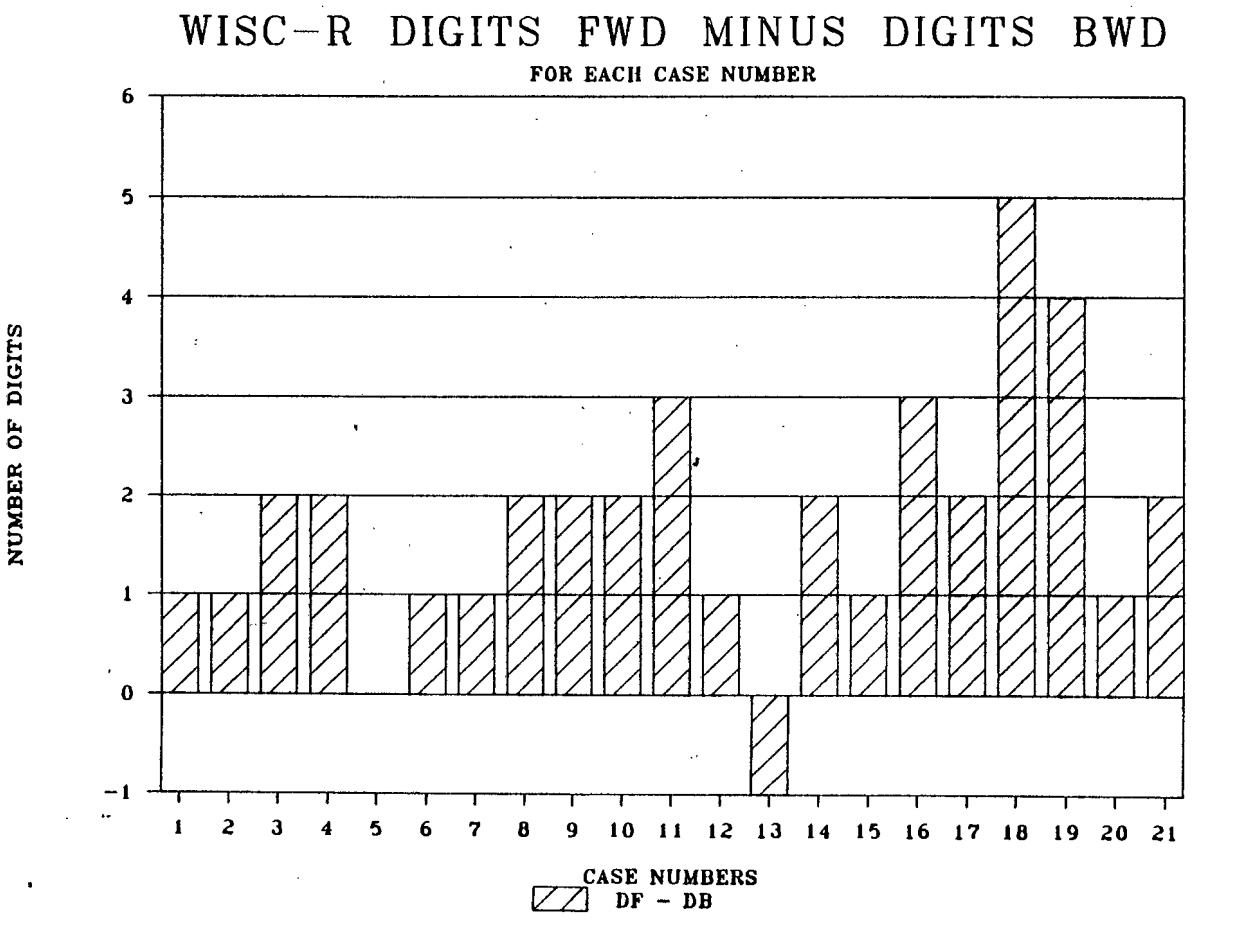


FIGURE 4.4.5 [B]

4.4.6 CONCENTRATION

The distinction between attention and concentration was discussed in the Sensory Parameter (refer section 4.1.2). It was suggested that attention deficits should be seen as occurring at the Input &/OR Output levels of cognitive processing, whilst concentration deficits occur at the Elaborational level. Logue (1970) echoes this distinction when he suggests that the ability to attend or exclude distracting stimuli is in relation to the external environment, whilst the ability to concentrate or keep one's mind in focus on a particular target relates to the condition of the brain itself and to the matter of motivation.

Assessment of these two abilities remains a problem, for attentional deficits can disguise concentration problems, and vice versa. In order to provide an index of this aspect of the children's functioning the average of the three subtests comprising Kaufman's "Freedom from Distractibility" (Arithmetic, Digit Span & Coding) [1], for each case number, is depicted in Figure 4.4.6 [A], below. This is a gross indication of possible problems with one or more of attention, concentration, motivation, perceptual field deficits (as reflected in difficulty with DB) or numerical ability. It is interesting to note that this measure does not discriminate between the younger and older groups of children. It also is able to focus on those children who display good concentration / attention.

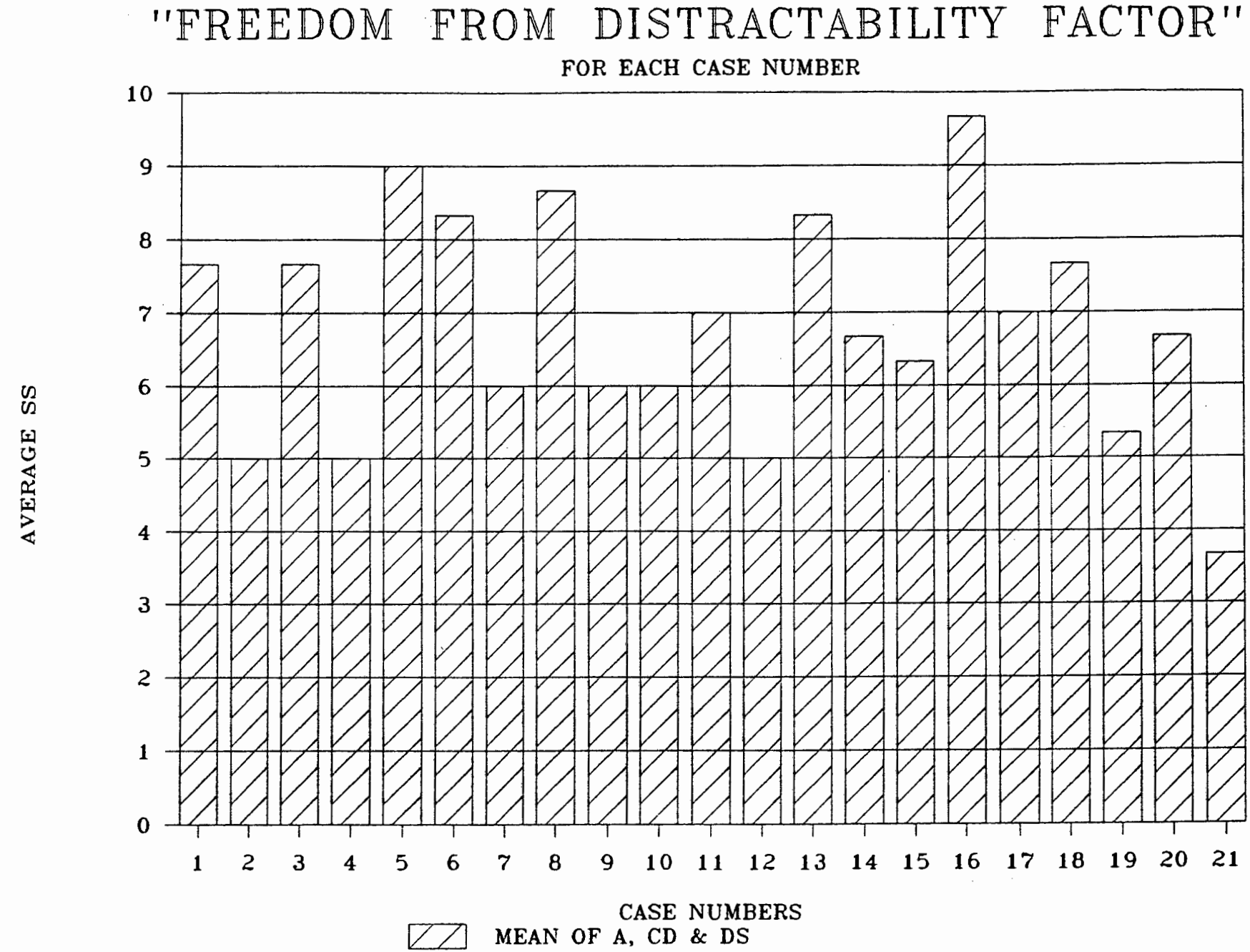

"FREEDOM FROM DISTRACTABILITY FACTOR"
FOR EACH CASE NUMBER
AVERAGE SS
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
CASE NUMBERS
MEAN OF A, CD & DS

FIGURE 4.4.6 [A]

4.5 THE PERSONAL PARAMETER

Information in this parameter provides quantitative measures of the children's physical attributes (height & weight), as well as an index related to their self concept, and data collected from two projective techniques.

4.5.1 PHYSICAL ATTRIBUTES

Gaddes (1981) stresses the importance of the physiological systems, other than primarily neurological ones, which support the healthy functioning of the human brain; more particularly those related to the chemistry, biology and genetic variations in the functions of the brain and nervous system. He suggests that many learning-impaired children fall into a category that subsumes physiologic involvement, although due to the complex interaction of numerous factors the physiological substrates cannot be clearly identified and are not understood.

The physiologic system chosen as a focal point within this parameter relates to the nutrition of the children, and its presumed effect on their cognition and behaviour.

The case history data presented in Chapter 3 provides ample evidence of children from economically disadvantaged families, with excessive alcohol consumption appearing as a consistent feature in all but one family. Whilst no specific details were

obtained relating to the mothers' prenatal diet, the children's current heights and weights, plotted against normative percentiles used by the Red Cross War Memorial Hospital, Cape Town, record a prevalence of well below average profiles. The results for girls and boys are depicted graphically in Figures 4.5.1 [A] & [B] respectively below; whilst Table 4.5.1 [I] summarizes the distribution frequencies.

TABLE 4.5.1 [I]

SUMMARY OF HEIGHT & WEIGHT DISTRIBUTIONS FOR GIRLS & BOYS

	GIRLS'		BOYS'		COMBINED	
PERCENTILE GROUP	WEIGHT *	HEIGHT *	WEIGHT *	HEIGHT *	WEIGHT *	HEIGHT *
<3		10	18.2	27.3	9.6	19.1
3 - <10	10	20	36.4	9.1	23.8	14.3
10 - <25	50	30	18.2	27.3	33.3	28.6
25 - <50	40	10	27.3	27.3	33.3	19.0
50 - <75		20		9.1		14.2
75 - <90		10				4.8

* indicates % children in each percentile group

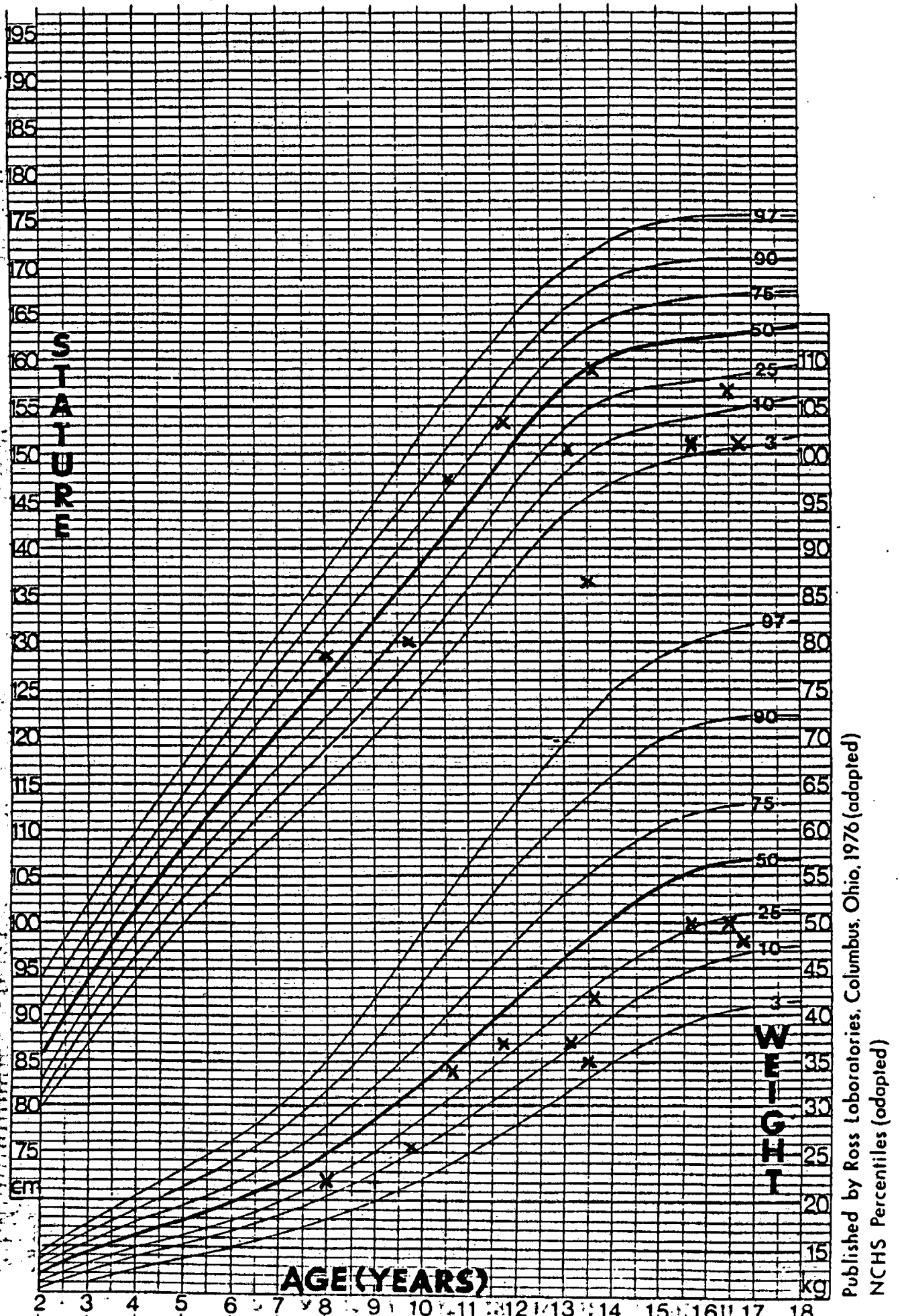
Gaddes (1981) points out that the pattern of causal relationships in the pregnant mother's diet, the child's diet during early life, and environmental deprivation appear to be the major determinants of a child's physical and mental potential. Furthermore he cites research by Shneour (1974) & Winick et al. (1972) that provides growing evidence that native

FIGURE 4.5.1 [A]

RECORD OF GIRLS' HEIGHTS & WEIGHTS

GIRLS: 2 TO 18 YEARS

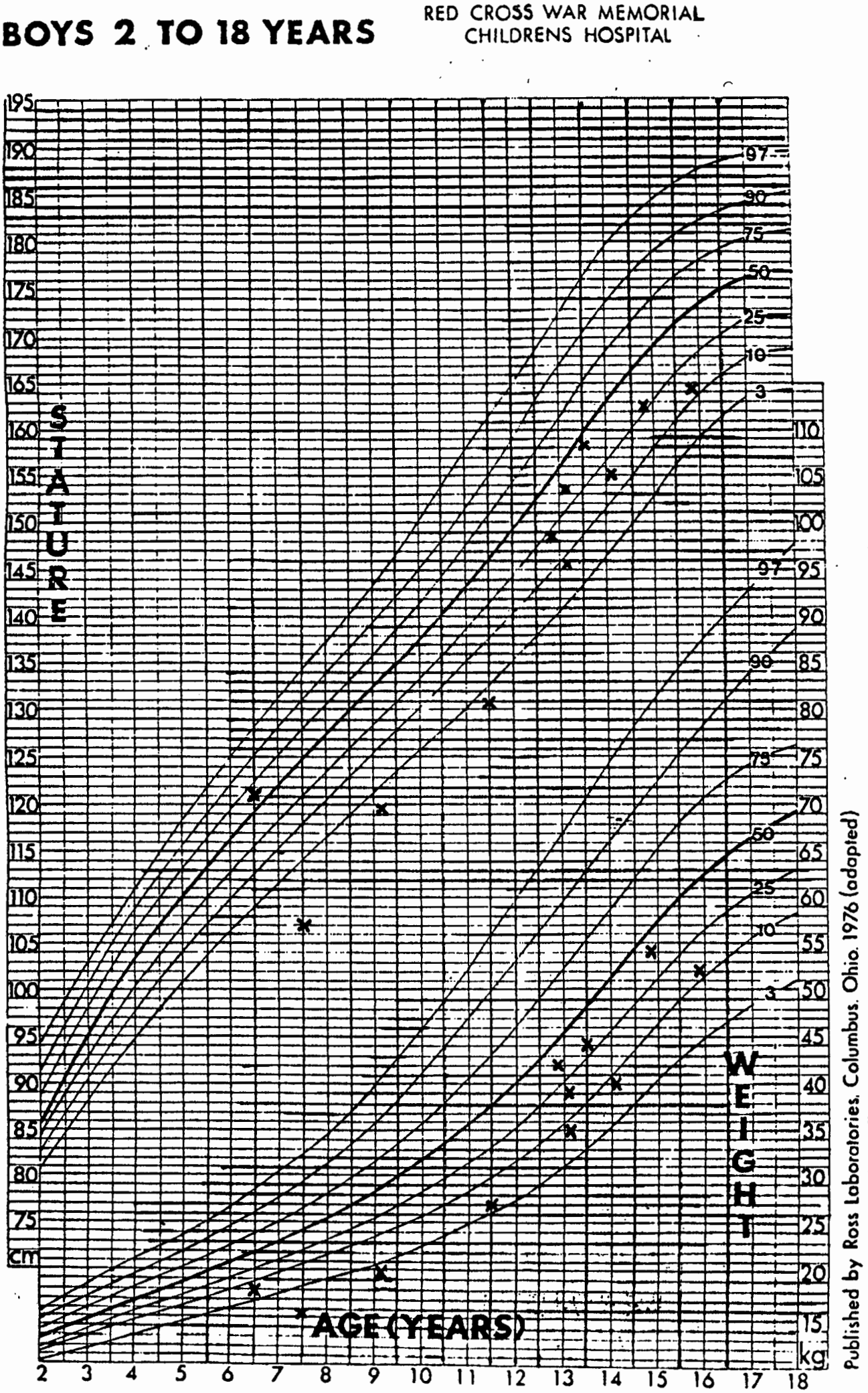
RED CROSS WAR MEMORIAL
CHILDRENS' HOSPITAL



Published by Ross Laboratories, Columbus, Ohio, 1976 (adapted)
NCHS Percentiles (adapted)

FIGURE 4.5.1 [B]

RECORD OF BOYS' HEIGHTS & WEIGHTS



intelligence can be permanently injured by inadequate diet; there being every chance that it is irreversible if occurring in early life, whilst malnutrition later in childhood, following adequate feeding prenatally and during infancy, may have little or no effect (p. 52). Molteno et al. (1986) state that the rapid fetal growth during the last 3 months of pregnancy, together with the first 18 months of life, represent the time of maximal brain growth, and that malnutrition during this phase will result in severe and persistent developmental retardation. Stoch et al. (1982) examined the association between malnutrition and behavioural development in a 20-year developmental study. They found that severe and prolonged undernutrition during infancy is capable of causing organic brain damage, as reflected in a small head (below the second percentile), abnormal CT scans in some cases and deficits in visuo-motor integration. Molteno et al. (1986) state that a slow growth rate is a more usual sign of under-nutrition in disadvantaged children, with developmental consequences being poorly documented.

Gaddes (1981) suggests that the complex cultural and physiological variables producing a mild dysgenisis of the brain which is too slight to show on a standard neurological examination, but is serious enough to interfere with normal thinking, could impede progress at school.

Research cited by Molteno et al. (1986) of 'Coloured', 'African'

and 'White' population groups showed that the 'Coloured' cohort exhibited a marked negatively skewed birth weight distribution, with a high incidence of low birth weight and an infant mortality rate comprising more neonatal than postnatal deaths (p. 46). Molteno et al. state that in developing countries depletion of maternal resources due to diminished food intake, closely spaced pregnancies and anaemia contribute to low-birth-weight infants. Furthermore an extensive review of over 30 growth studies in South Africa by Hansen (1984), showed that approximately a third of the 'African', 'Coloured' and 'Indian' children below the age of 14 years were underweight and stunted for their ages (cited in Molteno et al., 1986, p. 50).

The multiplicity of interacting variables in undefined mays that comprise the malnutrition cycle is best summarized by Adams (1968), who asks: "How do culture and society affect culture and society when mediated by nutrition and human growth and development?" (p. 465). Evidence suggests that whilst physiologic systems cannot be identified per se, there is a distinct possibility that malnutritional factors could partially account for some of the observed sensory-motor, cognitive and behavioural characteristics prevalent in this sample.

4.5.2 SELF CONCEPT

Academic success or failure appears to be deeply rooted in concepts of the self, especially those related to mental ability. "Self theory" is neither an established fact, nor an all-inclusive theory of human existence (Purkey, 1970), however the overwhelming body of contemporary research consistently indicates that self-esteem and academic achievement are correlated.

4.5.2.1 BRIEF HISTORY OF THEORIES OF "THE SELF"

In tracing the history of theories of "the Self" Purkey (1970) identifies Rene Descartes' book "Principles of Philosophy" (1644) as a turning point in man's awareness of the presence of his/her non-physical being. Despite the germination of this concept in the 17th century, expounded and developed by other philosophers such as Spinoza and Leibnitz, the dawn of the 20th century arrived without significant developments in this field of enquiry. William James' (1890) chapter on "The Consciousness of Self", and Freud's voluminous writings, from 1900 to 1938, focused attention on the self, albeit in the guise of ego development and functioning in Freud's case. For all the interest that these writings generated in the self, Munroe (1955) suggests both the Freudians and neo-Freudians generally hesitated to make the self a primary psychological unit. During the 1920's to 1940's the dominance attained by

J.B. Watson's (1925) behaviouristic approach in American psychology, with its emphasis on observable stimuli and *responses*, relegated explorations of the inner life of the individual to a neglected back bench. A few noted exceptions retained their interest in the development of the self within a social-psychological environment, including Mead (1934), Lewin (1935) and Goldstein (1939). The second half of the century saw a growth in interest and the elaboration of different aspects, including: Lecky's (1945) writings on the notion of self-consistency; Bertocci's (1945) on the self as object, "me", and the self as subject, "I"; Murphy's (1947) discussion on the origins and modes of self-enhancement, and the relationship of the self to the social group; Maslow's (1954, 1956) work related to self-actualization; Allport's (1937, 1943, 1955, 1966) articulation of a theory of personality which blended both humanistic and personalistic approaches; Combs & Snygg's (1959) explorations of the individual's "phenomenal field"; and Rogers' phenomenological approach (1951, 1958, 1965, 1969) which stresses the individual's subjective experience and feelings, as well as his/her personal views of the world and self. (All authors cited in Purkey, 1970, p. 3-6.)

More recently research and writing of Brookover (1959, 1962, 1964, 1965, 1967), Heider (1958), Patterson (1959, 1961), Combs (1965, 1969), Diggory (1966), Coopersmith (1967) and South African research, including Cronjé (1984), Van der Riet (1985) and Clark (1986) have provided a rich sample of the dynamics of the self in determining behaviour.

4.5.2.2 CHARACTERISTICS OF THE SELF CONCEPT & SELF-ESTEEM

Purkey (1970) derives the following composite definition of the "self concept" from a variety of authors: The self is "a complex and dynamic system of beliefs which an individual holds true about himself, each belief with a corresponding value" (p. 7).

This definition incorporates the following characteristics:
1) The self is organised. There is a relatively stable structure, characterised by harmony and orderliness. Each concept comprising the system has a generally positive or negative valence within the system. Success and failure are generalized throughout the system.

2) The self is dynamic. Combs & Snygg's comment that "the phenomenal self is both product of the individual's experience and producer of whatever new experience he is capable of" (1959, p. 146) articulates the dual concepts of the self as a vantage point, and the dynamic motivational quality, expressed as an insatiable need for the maintenance and enhancement of the phenomenal self. The implications that one evaluates the world and its meaning in terms of how one sees oneself, has repercussions for those students who perform poorly in school, simply because school activities seem irrelevant to them. Another feature relates to the fact that the self resists change as much as possible in order to enjoy a consistent and organized

world; however, given favorable conditions, the self will change. Purkey stresses the importance of this aspect for pupils, for if the educative process is deemed meaningful and self-enhancing, and the degree of threat provided by the school experience is not over-powering, they are likely to grow in self-esteem and academic achievement.

Self-esteem may be viewed as one of the dimensions of the self concept, and is described by Coopersmith (1967, p. 4) as "the evaluation that the individual makes and customarily maintains with regard to himself; it expresses an attitude of approval or disapproval and indicates the extent to which the individual believes himself to be capable, significant, successful and worthy." A child who experiences low self-esteem harbours feelings of self-rejection, self-derogation and evaluates herself negatively; whereas a child with high self-esteem would tend to evaluate himself positively, showing evidence of acceptance of self.

4.5.2.3 RELATIONSHIP BETWEEN SELF CONCEPT & SCHOLASTIC ACHIEVEMENT

Research evidence clearly shows a persistent and significant relationship between the self concept and academic achievement, although sex differences do seem to influence the relationship, with male underachievers tending to have more negative self concepts than female underachievers. There is no evidence of racial anomalies in research findings; students who evaluate

their abilities poorly consistently seldom succeed in school, regardless of their racial group.

Ausubel & Ausubel (1963), Crovetto et al. (1967) and Hawk (1967) all reported that the professed self concepts of disadvantaged children are characterised by low self-esteem and self-deprecation. Soares & Soares' (1969) comparative study of the self-perceptions of disadvantaged and advantaged elementary-school children found, on the whole, more positive self-perceptions among the disadvantaged children. This finding, which challenges the commonly held assumption that disadvantaged children have negative self concepts, has been supported by both Kerensky (1967) & Carter (1968). Purkey (1970) points out that the causes of the development of negative self concepts are more psychological than economic.

Durr & Schmatz (1964) reported that underachieving elementary-school children were more withdrawn, and tended to lack self-reliance, a sense of personal worth, and a feeling of belonging. They displayed immature behaviour and feelings of inadequacy.

Zimmerman & Allebrand (1965) studied 4th- & 5th-graders of middle to lower socioeconomic status, half of Mexican descent, and found that the poor readers lacked sufficient sense of personal worth, freedom, stability and adequacy to the extent that they avoided achievement. Carlton & Moore (1966, 1968)

have shown that self-directed dramatisation and self-selection of stories can improve the reading skills of elementary-school children, bringing about favourable changes in their professed self concepts.

That a persistent relationship exists between the self concept and academic achievement is well established. Care needs to be exercised in concluding erroneously that this relationship is in fact causal. It would appear that the continuous interaction between the two occurs in such a way that each directly influences the other.

4.5.2.4 DEVELOPMENT OF THE SELF CONCEPT

The self is not instinctive, but a product of experience that displays remarkable plasticity with infinite capacity for growth and actualization (Purkey, 1970, p. 30). An awareness of self occurs sometime during the child's first year of life. Initially totally dependent upon the love and care of those responsible for her, the manner of expression of such love influences the way the infant sees herself and the world. Together, the mother and father (or "significant others") thus occupy a critical role in moulding and maintaining the child's self-image; for the expectations of others are internalised, by the child, as self-perceptions. The powerful nurturing role occupied by parents is often inadequately played, through lack of knowledge, or insensitivity, or because of a tendency to

repeat their own childhood experiences, and results in a repeated pattern of the next generation of children growing up psychologically scarred.

Coopersmith (1967) lists three conditions which lead the developing individual to value himself as a worthwhile human being:

1) Parental warmth, whereby the child senses the love of his family.
2) Respectful treatment, whereby the child occupies a rightful and democratic position in the family.
3) Clearly defined limits, whereby the child comes to know through the parents demands and expectations that they care for him.

Purkey states that the child enters school with his psychological bags packed with all sorts of ideas about himself and his abilities, and that whilst the home environment assumes primary importance, the school environment is the secondary most important force in shaping the child's self concept. Traditionally the child is expected to adjust to the school, rather than the reverse. Unfortunately certain schools employ a punitive approach to education, with the resulting formation of highly charged negative attitudes toward learning (Deutsch, 1963). For many children schools are places where they face failure, rejection and daily reminders of their limitations. Many children give up, feeling that with no attempt there can be little or no humiliation.

The foregoing discussion draws attention to the fact that children's needs related to the development of positive self concepts require sensitive handling both in their home and school environments.

4.5.2.5 PROBLEMS RELATED TO EVALUATION OF THE SELF CONCEPT

Combs (1962) states that the self concept is "what an individual believes he is. The self report on the other hand, is what the subject is ready, willing, able or can be tricked to say he is. Clearly, these concepts are by no means the same" (p. 52). By drawing attention to the differences between these concepts Combs stresses the difficulties inherent is assessment of the self.

The 2 methods generally employed are (1) Self-report and (2) Observations. Both methods require cautious use due to the possibilities of projection of the examiner's own limitations and biases. The self-report method was chosen for this study. Unfortunately there are a host of contaminating variables in this method, such as familiarity/not of the item, response set/style and social desirability. Despite these inherent weaknesses some characteristics of the self are revealed.

4.5.2.6 THE ATTITUDES TOWARD SELF SCALE (ATSS)

This test is based on the semantic differential of Osgood, Suci & Tannenbaum (1957), developed by Nieuwoldt & Cronjé

(Cronjé, 1984), in an attempt to provide a shortened form of a self concept scale. The child is asked to evaluate her/himself on 10 dimensions; each dimension being represented by a ten-step ladder, with a positive and a negative pole labeled with a bi-polar adjective. By placing a cross in one of the ten steps forming each ladder the child records a self evaluation for that dimension. (Refer Appendix I, Annexure Gi & Gii for a copy of the Afrikaans ATSS & English ATSS.)

Cronjé (1984) reported a split-half reliability of .91 for her research sample. She suggests the low product moment correlation between the Piers-Harris questionaire and the ATSS suggests that each scale measures different aspects of the self concept.

ATSS: RESULTS

The results obtained from this scale were difficult to interpret for a variety of reasons:

Firstly, the wide age range in the sample meant that the younger children were unable to understand and employ a graded evaluative scale; for example the youngest child (Age 6 years) simply marked step 10 of each ladder. In fact a characteristic of the age differences is reflected in the fact that on average the younger children used a more restricted range of steps than the older children (average range of 3 steps for the younger, 6 for the older children). Figure 4.5.2 [A] below reflects the range used by each child.

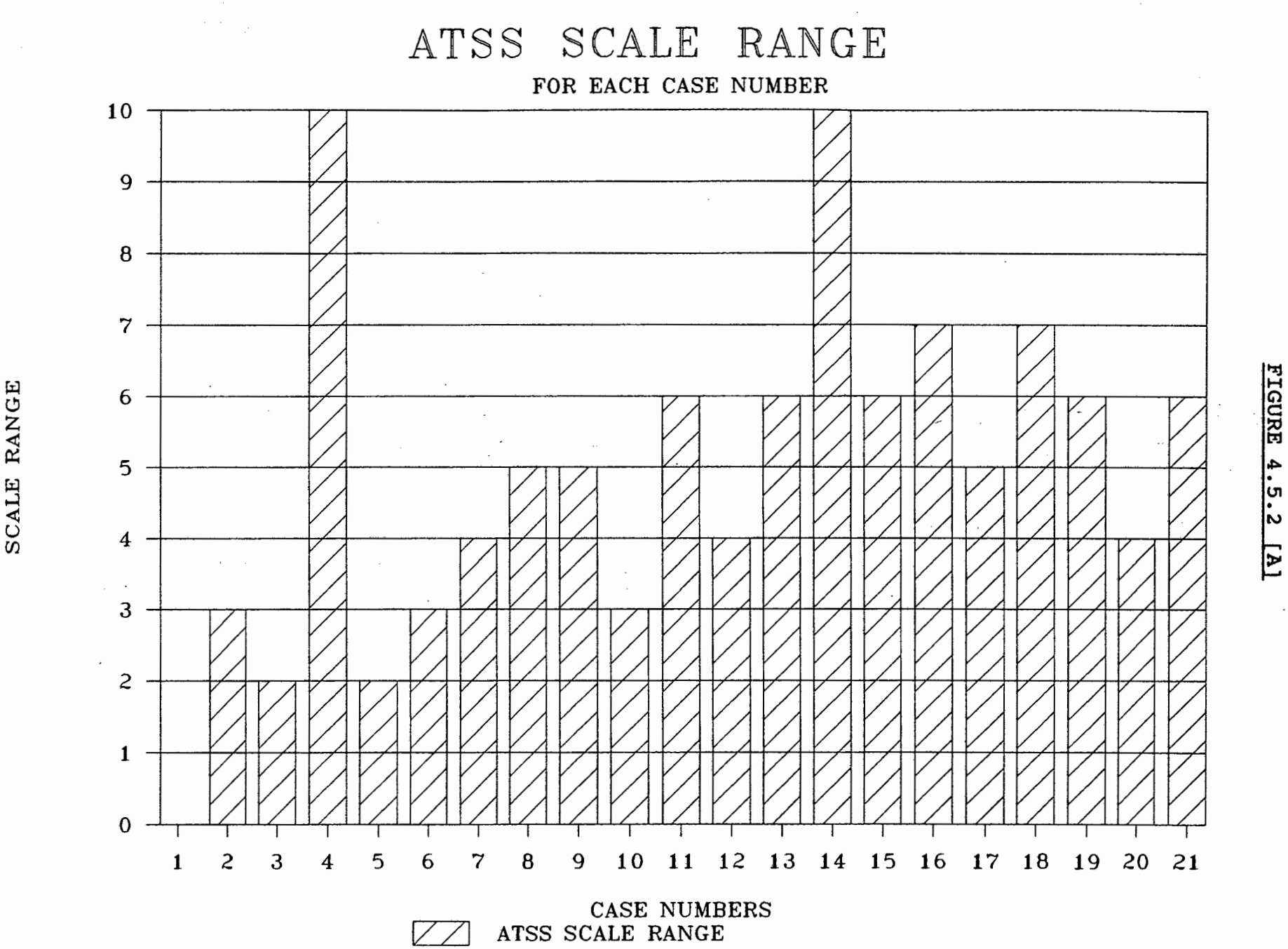

ATSS SCALE RANGE
FOR EACH CASE NUMBER
SCALE RANGE
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
CASE NUMBERS
ATSS SCALE RANGE

FIGURE 4.5.2 [A]

This observation would appear to reflect an interesting developmental aspect of growing cognitive abilities and self awareness, which allows for greater discrimination.

The second problem related to the interpretation of each child's own relative "internal" scales of assessment within the given 10 step scale provided by the ladder. For example, does one accept the upper and lower ranges of the child's assessment as his own positive/negative limits; or simply employ the "external" 10 step criterion, locating the child relative to 1 & 10? One possible means of avoiding such issues in the future is the restriction of the range of the scale; the most simplistic being the provision of dichotic either/or choices.

In view of the above mentioned problems the researcher has been cautious regarding interpretation of the results.

In general the children can be said to have positive self concepts, as reflected in the self-report ATSS. This is in keeping with Soares & Soares' (1969) results noted earlier for disadvantaged children, which challenged traditionally held views that all disadvantaged children have low self concepts.

The researcher examined the different <u>dimensions</u> of the scale for all children in the sample, to establish if there was a tendency to rate specific dimensions in the positive or negative spectrum. The analysis was made firstly using a quantitative

statistical approach (establishing the mean), and also by locating each child's upper and lower limits (i.e. the limits of each child's subjective range used), which were converted into a positive/negative score in the following way: The cumulative number of lower limits were subtracted from the cumulative number of upper limits, for each dimension. These results are reflected in Figures 4.5.2 [B] & [C] below. The abbreviated dimensions used on the x - axis of both these bar charts can be interpreted using the list below:

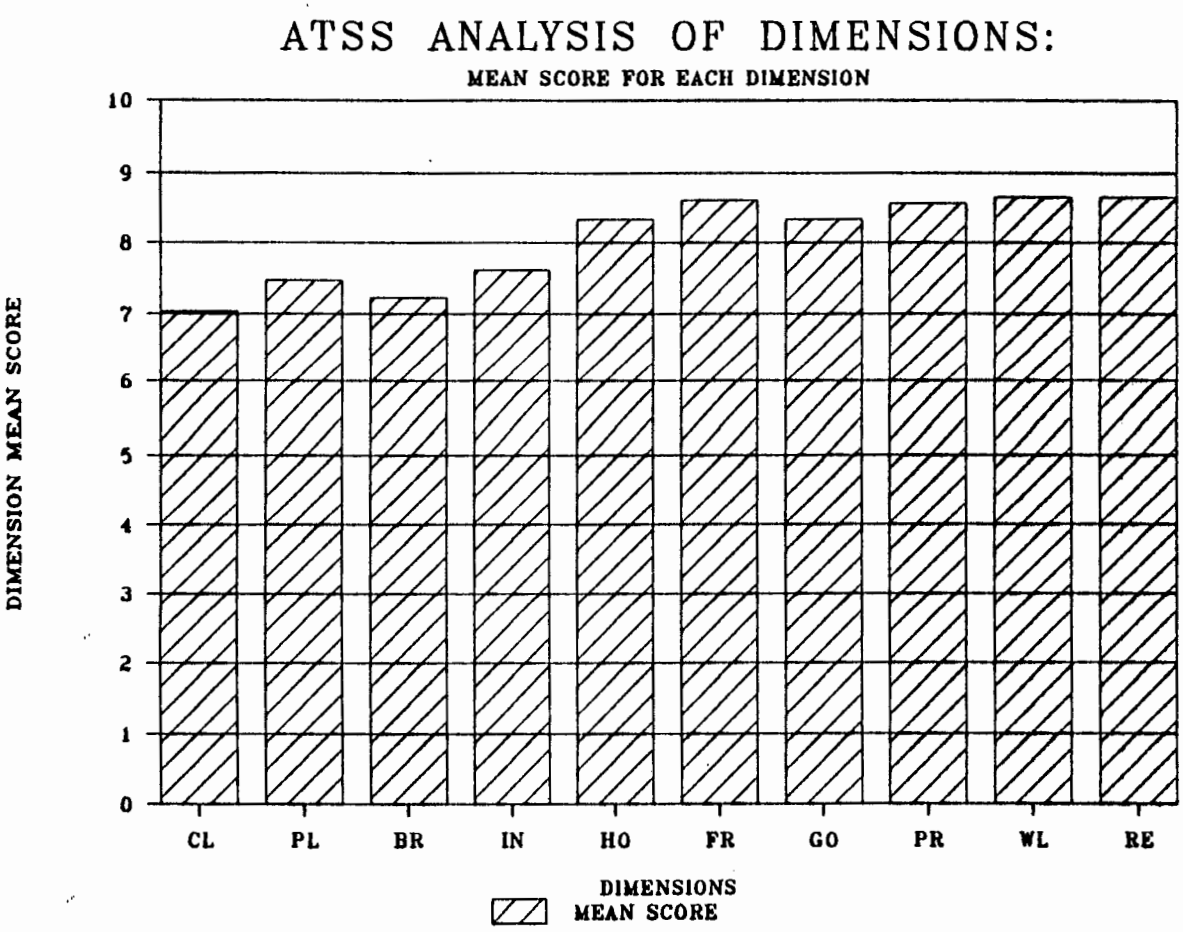
X - AXIS	DIMENSION
CL:	Clever / Stupid
PL:	Pleasant / Unpleasant
BR:	Brave / Afraid
IN:	Interesting / Boring
HO:	Honest / Dishonest
FR:	Friendly / Unfriendly
GO:	Good / Bad
PR:	Pretty / Ugly
WL:	Worth a lot / Worthless
RE:	Reliable / Unreliable

There is a degree of concordance between these two approaches, which confirms the generally positive nature of the responses.

Only 3 dimensions yielded "negative" evaluations, in Figure 4.5.2 [C], viz.:

1) Clever / Stupid
2) Pleasant / Unpleasant
3) Brave / Afraid

FIGURE 4.5.2 [B]



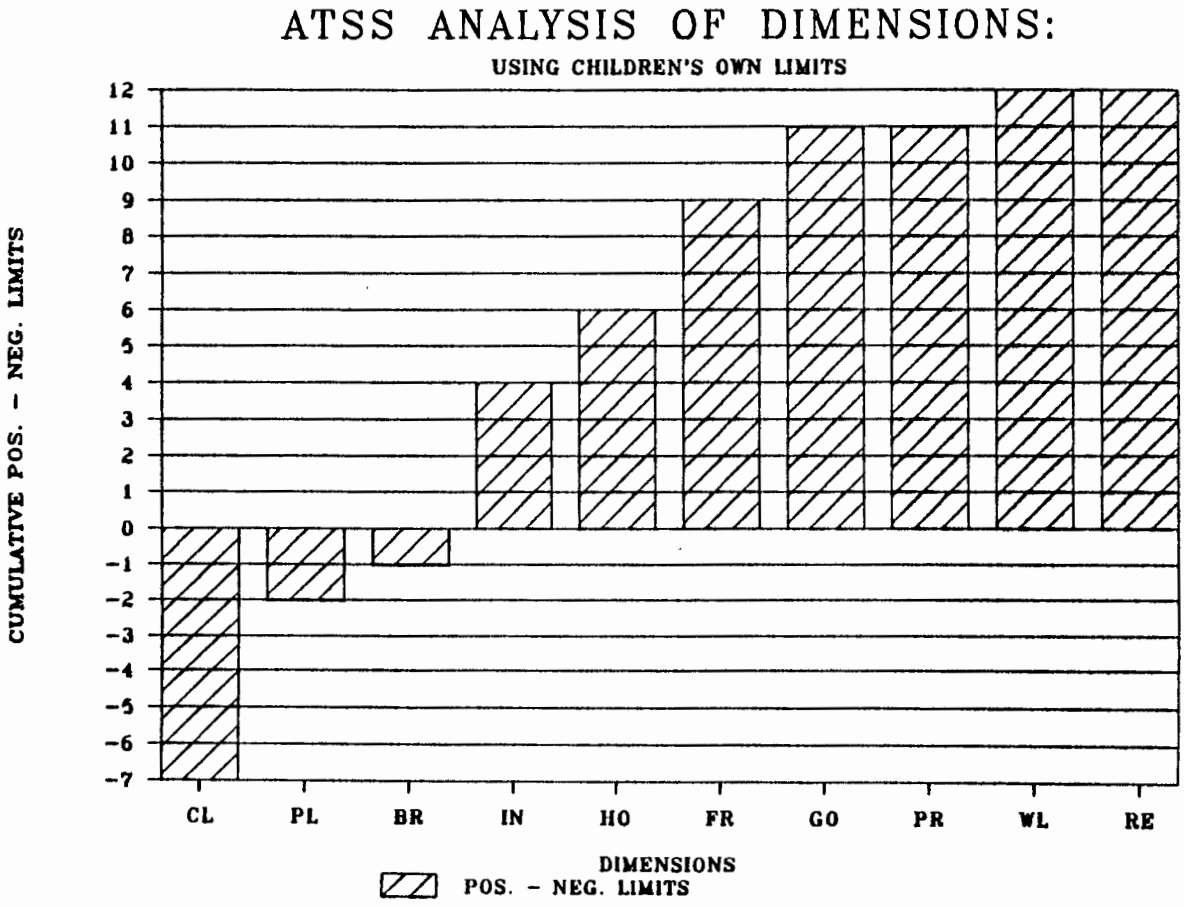


FIGURE 4.5.2 [C]

The fact that Clever / Stupid emerged as the most negative dimension is not surprising, given the evidence of scholastic failure and low achievement test performance on the assessments comprising this research. Purkey (1970) cites research evidence which shows that the image of school grows gradually less positive with time, and communicates a personal sense of inadequacy to many students. This sentiment is echoed in this research, and stresses the need for teachers and child care workers to try and prevent children entering a cul-de-sac where they decide that school is not the place for them.

The Pleasant / Unpleasant dimension may reflect the social aspects of the self concept, and hint at the children's feelings of being different, due to the stigma attached to their living in a children's home.

The Brave / Afraid dimension may reflect a psychosocial attitude of self-doubt, ineptitude and powerlessness exhibited by some children. Erikson saw such characteristics as products of a child's inability to cope effectively with the environment, and suggested that such children are conscious of being scrutinized (disapprovingly) or of being considered essentially helpless (Hjelle & Ziegler, 1976).

The dimensions listed as recording overwhelmingly "positive" evaluations in Figure 4.5.2 [C] were:

1) Reliable / Unreliable
2) Worth lots / Worthless
3) Pretty / Ugly
4) Good / Bad

These dimensions probably reflect the enhancing effects of the Annie Starck Village cottage environment. The Pretty / Ugly dimension demonstrated that the children generally have good body images.

4.5.3 PROJECTIVE TECHNIQUES

Anastasi (1982) notes that self-report inventories and projective techniques represent the best-known and most widely used instruments of "personality" appraisal. Whilst "personality" assessment refers in a broad sense to the intellectual and nonintellectual traits comprising the entire individual, the terminology of psychological testing usually refers to "personality" assessment as the measurement of characteristics such as emotional states, interpersonal relations, motivations, interests and attitudes. Reference has already been made to the self-report method used; this section focuses on projective techniques.

4.5.3.1 NATURE OF PROJECTIVE ASSESSMENT TECHNIQUES

Perhaps the major distinguishing feature of projective techniques is their assignment of a relatively unstructured task, in order to allow free play to the individual's fantasy; the underlying hypothesis being that the way in which the individual perceives and interprets the task will reflect fundamental aspects of her/his psychological functioning.

Anastasi (1982) states that typically these techniques represent disguised testing procedures, characterized by a global approach to the appraisal of personality, considered especially effective in revealing covert, latent or unconscious aspects of personality. The value of projective techniques relates to the qualitative information they yield, when interpreted as psychometric intruments. Cronbach & Gleser (1965) describe projective techniques as "wide-band" procedures: In contrast to the narrow band of information obtained from objective psychometric tests at high levels of dependability, projective techniques provide a much wider range of information of lower dependability.

4.5.3.2 PROBLEMS ASSOCIATED WITH PROJECTIVE TECHNIQUES

In general projective instruments are less susceptible to faking than are self-report inventories, but are not immune to it. This has been noticed especially regarding eliciting socially

desirable responses on sentence completion stems expressed in the first person. As 8 of the sentence stems used in this research use the personal pronoun "I", and 4 use the pronoun/adjective "me"/"my", this may have affected responses, although the children's generally uninhibited behaviour would suggest that it didn't constitute a major problem. The noticeable lack of interest displayed by some children in applying themselves to producing written verbal responses should be considered as a more significant contributing factor, resulting in an abbreviated selection of possible material.

Problems experienced with administering sentence completion tests to the younger children in this sample resulted in the examiner (researcher) writing down the child's response to each item. Some younger children did not complete every item, due probably to their lack of interest and restricted ideational repertoire; whilst some older children refused to complete items which elicited emotionally laden responses. Reference will be made to these sentences in the results.

Anastasi (1982) views the relatively unstandardized scoring procedures and lack of normative data as important considerations of the limitations of these techniques. The final steps in the evaluation and integration of the raw data usually depend on the skill and clinical experience of the examiner. The constructs, or categories, in terms of which the data are organized and built up inductively, through an

examination of the particular combination of data available, may reveal more about the theoretical orientation of the examiner than about the examinee's personality dynamics. This criticism is very real for the current research, given the investigator's intention of attempting to obtain general characteristics that are prevalent in groups of children, from culturally deprived environments. A positive co-joinder could suggest that awareness of these problems provides an examiner with a perspective that attempts to bridle some sources of bias. A complete and objective reporting of the data analysis, and an explanation of the development of hypotheses also provides opportunities for others to identify erroneous conclusions.

Contamination of data due to prior knowledge of the subjects has been minimized, as the data was initially analysed before an integrated picture of each child emerged, following the case history analysis. However, it is the opinion of the author that the "final" interpretation requires exposure to information such as that contained in the case histories. Thus for the purists, the inductive insights for the sample as a whole may be contaminated by knowledge gleaned from the case history information, the children's performance on the assessment battery, and their behavioural profiles.

4.5.3.3 FANTASY - WISH FULFILLMENT

The children were presented with a paper, headed with the following question: "If you were allowed three wishes for

anything that you wanted - in the whole world - what would you wish for?". This question was read out to the children, who were asked to write down their responses. All the children completed this test, the youngest child's responses being written down for him. The responses obtained were subjected to a content analysis.

WISHES: RESULTS

The analysis of the girls' and boys' wishes was handled separately, due to anticipated differences between the two groups. Tables 4.5.3 [I] & [II] below provide summaries of these results.

The boys and girls referred to a similar number of content categories (Girls 12; Boys 11 categories); however the younger 4 boys are represented in only 4 of these categories (Material objects (41.7%), Police/Army (33.3%), Animals (16.7%), Pop Star (8.3%)). This indicates more stereotypic responses in the younger boys' wishes. The younger girls, by contrast, are represented by a wider band of categories, and the girls' wishes generally show a greater inclusion of fantasy material, such as "I long to be a princess" & "My dreamland is America". (14.3% of girls' wishes included direct fantasy references, whereas only 3% of boys' wishes did).

Material objects understandably form a significant part of the children's wishes, given their deprived economic circumstances. It is interesting to note that whereas the girls explored a variety of career options, the boys are represented solely by the "Police/Army" category. This aspect no doubt reflects the impact of the turbulent current social-political climate in the Western Cape, where police and army personnel assume a noticeable public presence; but probably also provides a sense of identity of power and control to children whose life experiences have provided them with the exact opposite of these qualities. No girls made any reference to marriage and family, yet 3 boys did; one in a resigned manner ("Ek wil nie graag trou nie maar dit moet seker gebeur".)

One girl's wish to "see my mother and my sisters" achieved a degree of poignancy when the case history revealed that her mother is in fact dead. Another girl (Case No. 3; Age 9 years) choose not to enumerate 3 separate wishes, but wrote the following:

"Ek wens ek was 'n groot meisie om lank roke te kan draa dan wil ek ook 'n paaikie kam en boeke skool toe draa. dan swem daar 'n onse dam en roep my Mamie Maam".

This girl's mother is also dead. These wishes draw attention to the fact that many of the children have experienced the permanent loss of a parent (in most of the cases the mother), through death. Walker (1974), in discussing the need for understanding the complex interaction between the processes of

bereavement, which assume different responses at various ages in children, and the stages of the mourning process itself, reminds readers that separation from a loved one at any stage of childhood is traumatic. He specifically focuses on the child who has been separated from his parents and placed in substitute care, stating that analytic theorists refer to the considerable amount of psychic energy that has to be devoted to "the work of mourning" following an object loss. This approach suggests that all the children in the sample have been confronted with an object loss, of a temporary or permanent nature, and thus require support to work through the mourning processes which may temporarily or permanently interfere with their psychological and social development.

Another interesting sexual difference emerged when the "temporal status" of the wishes was noted. Those wishes relating to current needs, which could reasonably be achieved in the short term (e.g. wishes for material objects such as bikes, cars etc.; or wishing to go home/stay at Annie Starck) were grouped together; whilst those wishes related to long term goals (e.g. careers, growing up, marriage etc.) were placed in the same group. The fantasy wishes (e.g. to be a princess; my dreamland is America etc.) were excluded, due to the difficulty of placing them in a time continuum. The frequency percentage in each of these groups, for the girls and boys is summarised below:

GROUP	FANTASY	SHORT TERM	LONG TERM
Girls	14.3%	57.1%	28.6%
Boys	3.0%	27.0%	70.0%

TABLE 4.5.3 [I]

SUMMARY OF GIRLS' WISHES

RANK	NUMBER REFS	GIRLS	CONTENT	DETAILS
1	7	5	Material objects	Bike (2); Money (1); House (1) TV (1); Doll (1); Glasses (1).
2	6	5	Career	Teacher (2); Bank Manager (1); Doctor (1); Model (1); Ballerina (1).
3	5	3	Fantasy/ Travel	Dreamland is America (2); Travel to America, Hawai & Asia (1).
4	2	2	Fantasy/ Princess	To be a princess (2).
3	2	2	Family	To see my mother & sisters (1) To be a family again (1).
6	1	1	Religious	To be in heaven.
6	1	1	Pop Star	To be like Madonna.
6	1	1	School	To pass matric.
6	1	1	Grown up	Wishes she was already grown up.
6	1	1	Magical thinking	Wishes all her wishes came true.
6	1	1	ASV	Wishes she could stay at ASV.
6	1	1	Home	Wishes she could go home.

NOTE The headings indicate the following:

* RANK is allocated in accordance with the relative frequency of occurrence of the content.
* NUMBER REFS refers to the number of references to the particular content.
* GIRLS refers to the number of girls who have made reference to the content.
* CONTENT is a description of the category identified.
* DETAILS provides information regarding the content.

TABLE 4.5.3 [II]

SUMMARY OF BOYS' WISHES

RANK	NUMBER REFS	BOYS	CONTENT	DETAILS
1	10	5	Material objects	Bike (3); Car (3); Watch (2); Nice house (1); Richest man in the world (1).
2	7	5	Police/ Army	Policeman (5); soldier (1); catch thieves (1).
3	4	4	Future	Have children approximately 5 boys (1); Marry Chantal (1); Don't want to marry, but it will surely happen (1); Already grown up (1).
4	3	3	Sportsman	Soccer player (1); Athlete (1); Karate expert (1).
5	3	2	Travel	Eiffel Tower & Disneyland (1) To other lands (1).
6	2	2	Religious	To reach the kingdom of heaven (1); To be a child of God (1).
6	2	2	Animals	Own a dog (1); a snake (1).
6	2	2	Drive a vehicle	Drive a car (1); a kaspir (1).
7	1	1	Pop Star	To be String Fellow Hawk.
7	1	1	School	To satisfactorily complete my school career.
7	1	1	Fantasy	To own a palace.

NOTE The headings indicate the following:

* RANK is allocated in accordance with the relative frequency of occurrence of the content.
* NUMBER REFS refers to the number of references to the particular content.
* BOYS refers to the number of boys who have made reference to the content.
* CONTENT is a description of the category identified.
* DETAILS provides information regarding the content.

These differences create the opportunity to formulate interesting speculative hypothethis related to noted sexual differences. A conservative observation employing Maslow's need-hierarchy theory, would suggest that the occurrence of the type of longer term goals identified incorporate self-esteem and self-actualization needs; whereas the short-term goals relate to physiological, safety, belongingness and love needs. In terms of this model the boys generally are functioning at a higher level than the girls. An attempt to explain why this should be so is beyond the scope of this research.

4.5.3.4 INCOMPLETE SENTENCES

The 25 sentence stems used in the sentence completion task were developed at the University of Cape Town Child Guidance Clinic by Associate Professor Grover and her colleagues (Strickland, 1972). The purpose of the test is to elicit written material that can be analysed for specific content, in an attempt to glean information about attitudes.

An analysis of the responses to each sentence stem yielded information regarding certain content matter. Of the 25 stems 15 were not completed by all the children. The younger children accounted for the majority of these incompletions, due to their limited understanding of certain verbal concepts (e.g "future"); but items 15 ("Huwelikslewe/Marriage..") and 17 ("Wat kwel my/What pains me..") were not completed by some older children,

who found the content too threatening. The 13 items listed in Table 4.5.3 [III], below, were selected as representative of the most commonly occurring content topics.

NOTE: 1) The content has been translated into English; however when individual cases are cited the original words used by the child are quoted.

2) The "mixed" category in Table 4.5.3 [III] refers to an assortment of topics that do not share characteristics.

TABLE 4.5.3 [III]

RESPONSES FOR 13 SENTENCE STEMS

Sentence Number 2: "Die meeste mense wil/Most people want .."

(8 responses indicated a type of activity)
..to laugh (1); ..just laugh at me (1); ..to ride on boats (1); ..to dance in the disco (1); ..to litter (1); ..work at Elite (1); ..work to get by (1); ..me to take up ballet & piano (1);

(4 responses related to objects)
..big houses/beautiful homes (2); ..everyone to be rich (1); ..lots of things (1);

(4 responses related to physical abuse)
..to hit me (3); ..to hit you (1);

(3 responses related to adoption)
..to have me as their child (1); ..to keep me (1); ..want me to stay with them when I'm out of Annie Starck (1);

(2 responses were "mixed")
..not to hear lots of noise (1); ..that one day I'm a good father to my children (1).

Sentence Number 8: "Ek voel skaam as/I feel ashamed when.."

(6 responses related to adolescent-type concerns)
..a girl watches me (1); ..my girlfriend comes to me (1); ..I walk with girls (1); ..my girlfriend kisses me (1); ..my boyfriend is with us (1); ..when I'm naked in front of a boy (1).

(7 responses related to a type of activity)
..I cry/fight/meet someone/do something funny/do physical education (5); ..somebody stands next to me/looks at me (2);

(3 responses related to receiving friends/going to people)
..my friends come (1); ..they come to us (1); ..I must go to other people (1);

(2 responses indicated the child was never ashamed)

(3 reponses were "mixed")
..when I feel ashamed then Jesus also feels ashamed (1); ..people say I'm worth nothing (1); ..I'm with strangers (1).

Sentence Number 12: "Die mees gevaarlikste/The most dangerous.."

(13 responses related to "objects")
..a snake (7); ..death (2); ..a dragon/devil/lion/spook (4);

(3 responses related to accidents)
..roads are the national roads (1); ..accident (1); ..thing is when I play with a knife (1);

(2 responses contained moral overtones)
..thing to do is not to be honest (1); ..thing is not to steal (1);

(3 responses were "mixed")
..is when somebody follows me (1); ..day is when I am at school (1); ..thing is to stay away from other people's houses whom you don't know (1).

Sentence Number 13: "Die toekoms/The future.."

(5 reported negative reponses)
..is (very/terribly) difficult (3); ..is dangerous (1); ..I can't bear to think about (1);

(3 reported work/career related responses)
..I want to be a policeman (1); ..is very important in my life and I want to work (1); ..is when I want to be a ballerina and model (1).

(2 children didn't know)
..is a very unexpected thing (1); ..I don't know (1);

(2 children left out this item)

(3 children responded using similar temporal referents)
..of mine is nearby (1); ..that I am looking at is nearby (1); ..lies ahead (1);

(6 responses were "mixed")
..I feel happy (1); ..is when I prepare myself (1); ..I'm going home (1); ..is going to my mother (1); ..was when I married (1); ..I will be big (grown up) (1).

Sentence Number 15: "Huwelikslewe/Marriage.."

(5 reported positive responses)
..is pleasant/a nice thing/very nice/very happy (4); ..my family life is nice (1);

(4 reported negative responses)
..is not nice/burnt out ("doodgaan") (4);

(4 children left out this item)

(2 children referred to their ages)
..I am not old enough to think of it yet (1); ..I am interested but not now because I'm too young (1);

(6 responses were "mixed")
..there is a family (1); ..I long for my family (1); ..is my life (1); ..is around the corner (1); ..is a very interesting thing (1); ..when I get married I want to live in a palace (1).

Sentence Number 16: "Somtyds/Sometimes.."

(All except 1 child used personal pronouns/own name in their responses)

(12 responses expressed negative feelings/emotions)
..I become cross (3); ..I cry (2); ..I am boring (2); ..I don't feel nice/life isn't nice (2); ..I am very mixed up (1); ..I get annoyed with myself when I don't feel like talking to anyone (1); ..I feel ashamed (1);

(5 responses expressed positive activities/feelings)
..I play/play with A./like very much playing with animals (3); ..I am very clever (1); ..I am with my girlfriend (1).

(4 responses were "mixed")
..I am very naughty (1); ..I am naughty or not (1); ..I go home (1); ..I wonder (1).

Sentence Number 17: "Wat kwel my/What pains me.."

(4 related to Annie Starck Village)
..is my room mate (1); ..to be in A.S.V. (1); ..so much then? The children in the village (1); ..when I ask to use the phone the housemother always says no (1);

(4 children left out this item)

(2 related to school)
..my school (1); ..is that I always have to go to school (1);

(3 related to health)
..is when I am sick (1); ..is that I don't feel very healthy (1); ..I am very on edge (1);

(2 related to parents)
..is my mother/father (2);

(6 responses are "mixed")
..I don't know (1); ..snakes worry me (1); ..about him? (1); ..nothing worries me (1); ..the most is when I am alone (1); ..is to stay at home (1).

Sentence Number 19: "Ek is baie/I am very.."

(7 responses related to love for a person)
..love my brother/sisters and my brother (2); ..love my mother/friends/girlfriend/Swanja (a family member)/you (5);

(7 responses related to the self concept; 4 of them positively & 1 negatively)
..clever (3); ..good at sport (1); ..ugly (1); ..tall (2);

(5 responses related to personal qualities)
..happy (3); ..afraid of spiders/ghosts (2);

(2 responses were "mixed")
..much with bigger boys (1); ..fond of pets (1).

Sentence Number 20: "Die enigste moeite/The only trouble.."

(6 related to school, all negatively)
..is with my school work/school career (3); ..is to pass (1); ..is going to school (1); ..is my school because the girls fight in gangs (1);

(3 children left this item out)

(2 related to money)
..is to borrow money (1); ..is that I only had R1.00 (1);

(2 related to the home environment)
..is to be out of A.S.V. (1); ..is when the children "skinner" amongst themselves (1);

(7 responses were "mixed"
..are the sentences (1); ..is my father (1); ..is my shoelaces which are about to break (1); ..is when I'm with my friends (1); ..is to help your nearest (1); ..that you did was to go to the shops (1); ..is to do well (1).

Sentence Number 22: "My vader/My father.."

(No negative responses were recorded)

(6 responses related to personal qualities)
..is big/very small/brave/a good man/doesn't like to read/doesn't like lions (6);

(5 responses related to the father's work)
..builds houses (1); ..is a sailor on the sea (1); works at Cape Classicks (1); is an engineer/musician (2);

(5 responses related to love for him/child
..loves me (4); ..I like my father very much (1);

(3 responses related to buying/giving presents/sweets)
..buys me smarties (2); ..bought me a present (1);

(1 child did not respond to this item)

(1 response related to health)
..is a very sick man & is nearly dead (1).

Sentence Number 23: ""Ek/I.."

(5 responses referred to "love of"/liking somebody)
..love/like my mother & father/parents/father/brothers (4); ..love her (1);

(7 responses related to the self concept, all positive)
..love myself (because I am built nicely and have a pretty face) (2); ..am a very lively boy (1); ..am a very friendly person (1); ..am pretty or ugly you know it (1); ..like others (1); ..don't fight a lot (1);

(2 responses related to school)
..like mathematics (1); ..attend Blossom Street Primary School (1);

(2 responses related to the child's age)
..am 12/13 years old (2);

(1 child omitted this item)

(4 responses were "mixed")
..want to be a soldier (1); ..sleep well (1); ..have a pretty doll (1); ..am obedient sometimes to my house mother (1).

Sentence Number 24: "Op skool/At school.."

(11 responses had positive associations)
..I play (with my buddies) (2); ..I am playful (1); ..I enjoy it (1); ..the school is very nice (1); ..I am happy (1);..it is very nice when I and my friend make jokes (1);
..I am good at mathematics (1); ..I am a "Chairlady" (1);
..I am the cleverest (1);
..it is good to go to school (1).

(6 responses had negative associations)
..is not nice (2); ..the teacher gives us lots of work (1); ..I am naughty (1); ..I am a big devil then they know me well (1); ..I feel unhappy all day (1);

(4 responses were "mixed")
..we have to attend school (1); ..I eat my bread (1); ..the boys play dangerously (1); ..I am in Standard 2 (1).

Sentence Number 25: "Wat my meeste bekommer is/My greatest worry is.."

(7 responses related to family members)
..my brother who is sick/in hospital (2); ..when somebody fights with my brother (1); ..my father & mother (I like it when I am with them) (2); ..my father/mother (2);

(5 responses related to the self/self concept)
..about myself (1); ..that I won't grow (1); ..I am lazy (1); ..that I am too fat (1); ..that I am not like other children (1);

(2 responses related to adolescence)
..girls that speak nonsense about me (1); ..when I get my monthly period (1);

(5 responses were mixed)
..nothing worries me (1); ..death (1); ..that I have to go to church every Sunday (1); ..where I'm going to land up (1); ..that if I only had to do it (1);

(2 children did not complete this item).

Certain topics appear across a variety of different items, references to school probably being the most prolific. Apart from Sentence Number 24 ("At school"), school is referred to in 11 other items, the negative associations being double the number of positive associations. One child (Case No. 13; Age 13) made reference to his school work in 3 items: "Tuis doen ek my skoolwerk"; ""My grootste vrees is en skoolwerk"; "Die enigste moeite is my skoolwerk".

References to the self concept exhibited a similar imbalance between positive and negative associations; the balance tipping in favour of the positive side, which is in keeping with the self-report ATSS.

All 11 references in 9 items to mothers were either positive or neutral in content (e.g. "Die gelukkigste tyd in my lewe was toe ek saam met my moeder gaan inkopies doen"; "Ek is teleurgesteld omdat my moeder nog nie 'n huis het nie"). By contrast fathers were not referred to as frequently across items (4 times), although all references to "My father.." in Sentence Number 22 were positive. This is an interesting feature considering the relative absence of father figures in many of the families, reported in section 3.1. Any reference to "parents" and siblings showed positive affectional ties.

The 4 children who referred to Annie Starck Village all did so in a negative manner (Items 17, 20 & 23).

Religious conflicts surfaced in Case No. 17 (Age 15 years) who responded "My grootste vrees is as ek eendag voor die Here gaan verskyn" & "Wat my meeste bekommer is dat ek elke Sondag kerk toe moet gaan". The children are exposed to Christian religious principles in the home environment, and such a conflict may well represent one that many of the adolescents face.

The reference to the impact that death has on a young child is illustrated by the direct and indirect references to death of Case No. 8. (Age 11 years), whose mother died: "In our family I have a mother & a father"; "The future is going to my mother"; "I need my mother"; "My greatest worry is death".

Further interpretation is left to the following two chapters, which attempt to weave together the myriad threads of this research project.

4.6 CLUSTER ANALYSIS: A DATA.REDUCTION TECHNIQUE

Everitt (1980) states that in many fields the research worker is faced with a great bulk of observations which are quite intractable unless classified into manageable groups, which in some sense can be treated as units. Clustering techniques which have been largely been developed over the last two decades, provide opportunities for simplification of data with minimal loss of information.

The basic data for cluster analysis is "a set of N entities (for example, people) on which p measurements have been recorded" (Everitt, 1980, p. 9). In the current research setting the choice of a particular set of measurements used to describe each child in the sample constituted the frame of reference within which clusters were formed. This choice reflected the researcher's judgement of relevance for the purpose of classification. Thus the initial choice of variables is itself a categorization which relates to no mathematical or statistical criteria, but reflects the researcher's own judgement of relevance for the purpose of the classification.

4.6.1 CHOICE OF VARIABLES

The choice of variables for inclusion within the cluster analysis performed was governed by the emphasis on cognitive aspects of the children's functioning. Thus the cognitive and

sensorimotor assessments form the greatest proportion of those variables included. The FIQ assessment variable was excluded, for it is reflected in the VIQ & PIQ scores. A selection of "descriptive" variables relating to the children was also included. The visual acuity, height and weight assessments were excluded, as these related to physical characteristics of the children, and were considered inappropriate. Motor assessment data was abbreviated, due to the difficulties of interpreting Denckla's (1985) scoring criteria, and the lack of appropriate normative data for this test. The Purdue Pegboard assessment was included, as also the UCT Reading & Spelling achievement test scores. The ATSS was excluded. The final tally was 38 variables selected for 21 children (cases). A list of the groups of variables selected (with a mnemonic in brackets following each variable, to be used for reference purposes) is listed in Table 4.6.1 [I] below.

4.6.2 HIERARCHICAL CLUSTERING TECHNIQUES

The majority of clustering techniques begin with the calculation of a matrix of similarities or distances between entities. The output (i.e. the number of clusters and the cluster membership) will only be as meaningful as the input similarities and distances. Difficulties relate to the choice of which similarity/distance measure to use, since different measures can lead to different results.

TABLE 4.6.1 [I]

LIST OF VARIABLES SELECTED FOR CLUSTER ANALYSIS

Descriptive

1. Sex (SEX)
2. Age (AGE)
3. Age admitted (AGEADM)
4. Years in A.S.V. (YRSASV)
5. Years pre-school (YRSPSK)
6. Number of schools attended (NOSKLS)
7. September Class Average (SEPTAV)
8. Pass/Fail September Av. (P/F)

Sensory

9. Auditory Discrimination (ADISC)

Motor

10. Eye - Right/Left (E)
11. Hand - Right/Left (H)
12. Foot - Right/Left (F)
13. Cross Dominance Eye/Hand (CDEH)
14. Mixed Dominance Hand/Foot (MDHF)
15. Purdue Pegboard Preferred Hand (PPH)
16. Purdue Pegboard Non-preferred Hand (PNPH)
17. Purdue Pegboard Both Hands (PBH)

Language

18. UCT Graded Reading Test (GRT)
19. UCT Speed Reading Test (SRT)
20. UCT Graded Spelling Test (SPEL)

Sensorimotor

21. Beery Visual Motor Integration Test (VMI)
22. Goodenough-Harris Draw-a-Person test (DAP)
23. Draw-a-Person Male/Female Figure Drawn (DAPMF)

Cognitive

24. Verbal IQ (VIQ)
25. Performance IQ (PIQ)
26. Information (I)
27. Similarities (S)
28. Arithmetic (A)
29. Comprehension (C)
30. Digit Span (DS)
31. Picture Completion (PC)
32. Picture Arrangement (PA)
33. Block Design (BD)
34. Object Assembly (OA)
35. Coding (CD)
36. Mazes (MZ)
37. Benton Visual Retention (BENVR)
38. Digits Forward minus Digits Backwards (DFB)

Everitt (1980) cites Cormack's (1971) paper reviewing cluster analysis techniques which suggests there are roughly 5 types. One of these groups is known as the Hierarchical Clustering Techniques - in which classes themselves are classified into groups, in a process that is repeated at different levels to form a tree-like structure, or dendrogram. Hierarchical techniques comprise two types of analysis: (i) "agglomerative" methods, which proceed by a series of successive fusions of the N entities into groups, and (ii) "divisive" methods, which partition the set of N entities successively into finer partitions. The agglomerative procedure was used in this research.

At any particular stage of the agglomeration process the method selected to fuse entities, or groups of entities, which are closest/most similar may differ, due to the different ways of defining distance/similarity between an individual and a group containing several individuals, or between groups of individuals. Selective use was made of the Single Linkage Method, which defines distance between groups in terms of the distance between their closest members; the Complete Linkage Method, which defines the distance between groups as the distance between their most remote pair; the Group Average Method, which defines distance between groups as the average of the distances between all pairs of individuals in the 2 groups; and Ward's Method, which at each step in the analysis considers the union of every possible pair of clusters, and selects those

two clusters whose fusion results in the minimum increase in the error sum of squares (Ward, 1963, cited in Everitt, 1980).

The majority of applications of agglomerative hierarchical techniques have been in the fields of biology and zoology, where grouping with respect to genetic characteristics is useful. Solomon (1971) describes several applications of clustering, and cites an example of a researcher who used the method to cluster a sample of 82 children under observation at an aphasia clinic, on the basis of 27 physiological, psychological and biographical measurements for each child.

4.6.3 PROBLEMS ASSOCIATED WITH CLUSTER ANALYSIS

There are some problems associated with cluster analysis techniques which require consideration. These are enumerated below:

1.) The definition of a cluster: Several attempts have been made to define the term "cluster". Everitt (1980) states that the common feature of most proposed definitions is their vague and circular nature, in the sense that terms such as similarity, distance, alike, etc. are used in the definition, but are themselves undefined. What emerges is that there is no universal agreement on what constitutes a cluster; in fact Everitt suggests that no single definition is sufficient (1980, p. 59). He offers the following description of what constitutes a cluster, which probably agrees with one's intuitive

understanding of the term: One should consider entities as points in a p-dimensional space, with each of the p variables being represented by one of the axis of this space, so that the variable values for each entity define a p-dimensional co-ordinate in this space. Clusters can be described in terms of this space containing a relatively high density of points, separated from other such regions by regions containing a relatively low density of points. Clusters such as these may be described as "natural clusters". He suggests that this description matches the way in which we detect clusters visually in 2- or 3-dimensional space (1980, p. 60).

2.) Identification of the cluster by its shape: Problems relate to the fact that the majority of clustering techniques find clusters of a particular shape, despite the fact that there is usually no a priori reason for believing that any clusters present in the data are of one particular shape. Thus by using the wrong clustering technique the researcher may impose a particular structure on the data, rather than find the actual structure present.

3.) Determining the number of clusters present: The problem of determining the most appropriate number of clusters present for a set of data can be a difficult one, and despite numerous literary references on this topic Everitt (1980) suggests that no completely satisfactory solution is available. A practical solution disregards the need for formal tests of significance in favour of the researcher considering the possibility of several alternative classifications, each reflecting different aspects of the data.

4.) The presence of "chaining" within clusters: The average and single-link methods of hierarchical clustering give rise to a property called chaining, which refers to the "tendency of the method to cluster together at a relatively low level objects linked by chains of intermediates" (Everitt, 1980, p. 67). Whilst this is often viewed as a defect in the method, Jardine & Sibson (1968) state that to call chaining a defect is misleading, for they consider it to be simply a description of what the method does; and that the product is one of optimally connected clusters, not necessarily an homogenous cluster.

5.) No reallocation of entities previously poorly classified: Hierarchical clustering techniques have a general disadvantage in that there is no possibility of correcting for poor initial partitioning.

6.) Objection to several agglomerative techniques on mathematical grounds: Sibson & Jardine (1968) object to the fact that the similarity and distance measures calculated rarely have strict numerical significance.

7.) Problems related to the stability and validity of the clusters identified: References of stability and validity relate to more basic issues of whether a researcher is interested in dissection or classification of data. Cormack (1971) & Fleiss et al. (1971) both suggest that classification is a technique for generating hypotheses, whereas dissection is not. Given the aims of this study, viz. an exploration of the primarily cognitive functioning of a sample of institutionalised children from culturally deprived backgrounds, the aim of using

cluster analysis is to provide a descriptive summary of the data. Regarding the validity of clusters, many authors argue that this should be judged qualitatively, by subjective evaluation and interpretability. Quantitative methods of evaluation are available, but Everitt reports that more work is needed on these methods of assessing the formal significance of clusters.

4.6.4 CLUSTER ANALYSIS OF 38 VARIABLES

The exploratory cluster analysis in this study was undertaken firstly to cluster variables, in terms of the characteristics exhibited in defining the children; and then to cluster the children (cases) in terms of the variables. The selection of 38 variables has already been discussed. The dendrogram produced by the CLUSTAN computer package (Wishart, 1978), employing the average link method, was selected for interpretive purposes, although both the complete and single linkage methods were also used. The average link dendrogram produced clusters more readily interpretable in terms of existing psychological research findings (see for example Sattler, 1982).
Figure 4.6.4 [A] reproduces the dendrogram.

Acknowledging the exploratory nature of this research, the author does not consider it necessary to critically address the 7 problem areas noted above, but simply attempt to derive some meaning from the dendrogram, by firstly identifying and then interpreting the clusters.

The identification and interpretation of clusters of variables are moulded by the purposes for such activities. The current research endeavour is an attempt to provide information on the functioning of a sample of institutionalised children; the purposes for the cluster analysis related to an exploratory summary of clusters of variables. The interpretation of those clusters identified serves the dual functions of suggesting some common factors linking certain variables, as well as focussing on specific variables with regard to the rationale for their inclusion in future assessment batteries.

To abbreviate descriptive reference points in the dendogram the following notation was used:

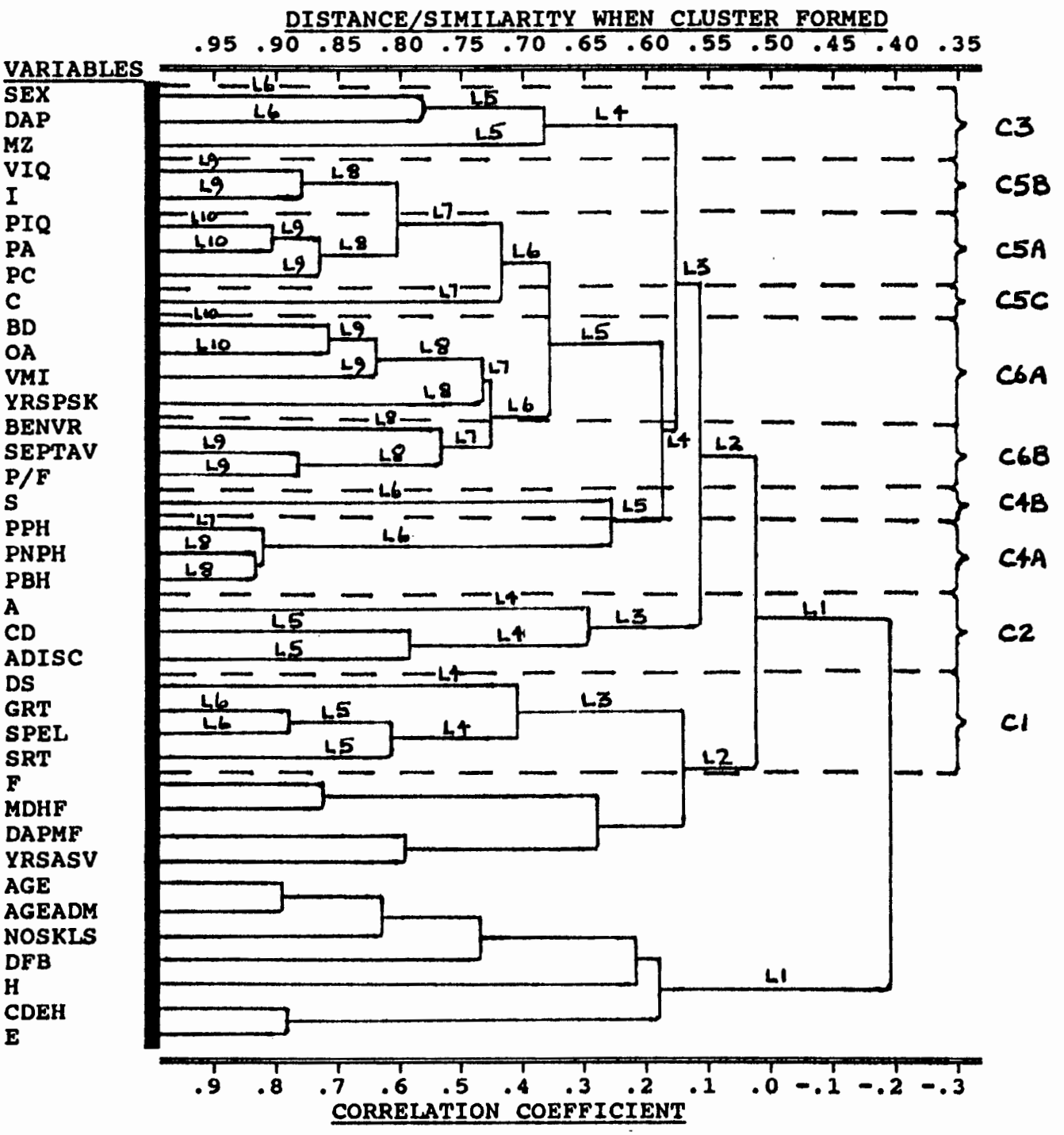
* L1, L2, L3, ... L10 = Level 1/2/3.../10 i.e. the level of branching of the cluster on the dendrogram; L1 is located at the right hand side / "top"; L10 at the left hand side / "bottom" of the diagram.

The identification of clusters pursued a top-to-bottom flow (right-to-left) i.e. from L1 to L10; however the characteristics of each cluster identified were established by those variables linking at the lowest levels possible. Thus the interpretation of clusters assumed a bottom-to-top process of establishing a degree of commonality between variables at their closest points of association.

Table 4.6.4 [I] below lists those clusters identified for interpretive purposes.

FIGURE 4.6.4 [A]

DENDROGRAM PRODUCED FOLLOWING CLUSTER ANALYSIS OF 38 VARIABLES USING AVERAGE DISTANCE METHOD.



NOTE: Refer to the Glossary of Mnemonics (Page ix) for descriptions of the variables used.

TABLE 4.6.4 [I]

SUMMARY OF CLUSTERS IDENTIFIED

CL. NO.	LEVEL	NO. VAR.	VARIABLES V1	V2	V3	V4
1	L3	4	GRT	SPEL	SRT	DS
2	L3	3	CD	ADISC	A	
3	L4	3	SEX	DAP	MZ	
4 4A 4B	L5 L6 L6	4 3 1	 PNPH S	 PBH	 PPH	
5 5A 5B 5C	L6 L8 L8 L7	6 3 2 1	 PIQ VIQ C	 PA I	 PC	
6 6A 6B	L6 L7 L7	7 4 3	 BD SEPTAV	 OA P/F	 BEERY VMI BENVR	 YRSPSK

NOTE: These clusters are marked on the dendrogram in Figure 4.6.4 [A], above.

The "lower" branch of the L1 cluster of variables comprised mainly of descriptive and neuro-motor laterisation variables was not considered significant for interpretive purposes. An interpretation of the 6 clusters identified follows:

Cluster 1 {GRT, SPEL, SRT, DS} was the only cluster identified on the "lower" route of the L2 limb, and is relatively isolated from the remaining clusters. The lowest order variables suggested the importance of abilities specifically related to reading & spelling. Using "Structure of Intellect" (SOI) terminology (Sattler, 1982, p. 606) these abilities comprise Memory for Semantic Systems, Memory for Symbolic Systems and

Cognition of Symbolic Systems. The inclusion of the SRT adds a perceptual speed component, whilst the WISC-R DS accentuates the memory factors, echoing the SOI Memory for Symbolic Systems. The common features thus comprise the SOI Cognition and Memory of Semantic (words) or Symbolic (letters) material, plus factors including attention and concentration. The position of Cluster 1 on a separate limb draws attention to the noticeable lack of any correlation between the reading/spelling assessments and others related to scholastic achievement.

Cluster 2 {DC, ADISC, A} lies on the "lower" limb of the L3 branch. The structure of this cluster is interesting, for the presence of 2 of the 3 WISC-R subtests incorporated in Kaufman's (1975) "Freedom from Distractibility" factor, suggest that this is one possible dimension included within the cluster. SOI terminology reduces CD to the Convergent Production of Figural units; ADISC to the Cognition of and Memory for Semantic Systems; and A to both the Memory for Symbolic Implications and the Cognition of Semantic Systems. The derivation of shared characteristics within this cluster structure is more difficult; however it would appear that Cluster 2 is in fact comprised of abilities involving specific skills related to encoding symbols/sounds (CD & ADISC), numerical abilities (A), and factors affecting attention and concentration. The lack of discrimination between different types of sensory input (e.g. aural & visual) suggests that the mental operations are the site of shared common factors between these variables.

Cluster 3 {SEX, DAP, MZ} lies on the "upper" L4 branch. The fact that the 2 visuographic measures, DAP & MZ, included in this cluster, are isolated from the body of cognitive variables queries the nature of the "cognitive" information which these 2 tests yield. The DAP, in particular, is a time-consuming test to score, and unless used qualitatively, or as a non-threatening introduction to an assessment session, its value in terms of providing focused evidence of cognitive functioning, as defined by the other clusters, is suspect. Alternatively, it could be argued that it does yield a sample of cognitive data along an unspecified dimension not provided by the other measures. If the purpose of this classification was to select those variables (assessment tools) most likely to provide evidence of the cognitive functioning of children from culturally deprived environments, the DAP & MZ tests would not merit selection purely on their cognitive functioning data yield.

Cluster 4 lies on the "lower" L5 branch, and provides for the inclusion of fine-motor assessment measures within the "lower" L4 limb. The derivation of common abilities in this cluster at the L5 level proved an impossible task, due to the chaining of the WISC-R S subtest to the homogenous fine-motor cluster. The author decided that Cluster 4 could only be successfully defined by including 2 sub-groups, 4A & 4B.

Cluster 4A's {PNPH, PBH, PPH} motor assessment data includes good finger dexterity, hand-eye co-ordination, left-right motor co-ordination and motivational components. The complex

integration and synchronisation demanded for a good performance on this task, especially when using both hands, probably explains its inclusion within the branch of largely "cognitive" variables. This grouping confirms the existence of a relationship between neuro-motor and cognitive functioning. Cluster 4B {S} is "chained in" at a higher level to the relatively homogeneous groupings of fine motor tests, as measured by performance on the Purdue Pegboard. What is interesting is the isolation of the S (Similarities subtest) variable from the remaining body of "cognitive" variables, and its chaining into a homogeneous cluster of motor variables. This draws attention to the lack of significant correlations between this subtest and other WISC-R subtests. Sattler (1982) reports correlations of .71, .72 & .58 between S and FIQ, VIQ & PIQ, for the standardization sample. This compares poorly with those of .3257, .5571 & .0954 for this sample. Ferinden & Jacobson (1969) state that the S subtest measures both concrete and abstract reasoning abilities. Glasser & Zimmerman (1967) suggest that the ability to discriminate classes of objects develops in a child through exposure to materials and information, both at home and at school. What is clearly evident is that the restricted categorisation skills demonstrated by the children is a feature of their concrete thinking, and the lack of exposure to a rich source of materials and information in their home environments. This characteristic has been researched by Haywood and associates, whose studies have shown that by providing stimulus enrichment, in the form of an increased number of exemplars, those individuals whose retardation is associated with cultural deprivation have

significantly more ability to form verbal abstractions (Gordon & Haywood, 1969; Tymchuk, 1973; Haywood & Switsky, 1974). Identified in this way, psychometricians should be aware that whilst categorization skills can be considered a worthwhile source of information of children's cognitive functioning, they display vulnerability to cultural/socio-economic deprivation.

Clusters 5 & 6 comprise the most sensitive assessment indices in the dendrogram, yielding information related to the significant composite measures of VIQ, PIQ and SEPTAV. The structure of these clusters is more complex than the preceding ones.

Cluster 5A (PIQ, PA, PC) reflects the shared variance between the PIQ, PA & PC measures. An interesting feature of this data is the relatively high correlation of PC & PA with all 3 IQ measures, compared with those of the standardisation sample. These are summarised below.

ASV SAMPLE			STD. SAMPLE		
	PC	PA		PC	PA
FIQ	.82	.83	FIQ	.57	.55
VIQ	.60	.62	VIQ	.50	.49
PIQ	.79	.80	PIQ	.54	.52

Evidence such as this queries the exact nature of both Kaufman's (1975) "Verbal Comprehension" factor (K's VCF), with mean loadings in the standardisation sample on the following subtests:

I = .63, S = .64, A = .37, C = .64 & Vocabulary = .72;

and the "Perceptual Organisation" factor (K's POF), whose mean factor loadings were:

PC = .57, PA = .41, BD = .66, OA = .65 & MZ = .47

(Sattler, 1982). It appears that both these factors have assumed different dimensions for this sample. Viewed from a different perspective what appears significant is that both the PC & PA subtests, which comprise loadings on K's POF, are closely connected to the {VIQ + I} cluster. This could attest to the significant role and invasiveness of a perceptual organisation factor (defined somewhat differently to that of Kaufman), in the cognitive structure and functioning of these children; thereby implying that K's POF incorporates two different types of processing, viz. that typified by the PA & PC subtests, which appear more closely aligned with the semantic domain, and the BD & OA subtests, which link more closely with the visual motor functioning area.

Cluster 5B's {VIQ, I} SOI components for I are too numerous to mention, so that this cluster is probably best interpreted as providing information of a semantic nature.

The linking of Clusters 5A & 5B at L7 emphasizes the strength of influence of a semantically based perceptual organisation factor. Interpretation of such a feature is possible within the model of deficient cognitive functions suggested by Feuerstein et al. (1979). The occurrence of specific Input Level deficits, such as blurred and sweeping perception, unplanned, impulsive and unsystematic exploratory behaviour, lack of/impaired

receptive verbal tools which affect discrimination, and lack of/impaired need for precision or accuracy in data gathering would spawn poor perceptual organisational abilities, which would in their turn impact successful functioning at both the Elaborational and Output Levels. The result is poor performance on achievement tests such as PA & PC (yielding a semantic POF), and BD & OA (yielding a visual-motor POF).

Cluster 5C (C) is a "one variable" component of the larger Cluster 5 group, and suggests the relative independence of the WISC-R C subtest from the POF. The SOI description of this subtest as the Evaluation of Semantic Implications does link the abilities shared with Clusters 5A & B through a common semantic involvement. It is interesting to note that of the 3 WISC-R subtests which exhibit mean loadings on K's VCF, only the I & C subtests are clustered together; the isolation of the Similarities subtest and possible reasons for this were mentioned in the discussion of Cluster 4 variables.

Cluster 6 variables all suggest evidence of a focus on visual processing skills.

Cluster 6A (BD, OA, VMI, YRSPSK) emphasises the visual motor aspects of Cluster 6. The inclusion of the descriptive variable YRSPSK, chained in at L8, may suggest that the pre-school years provide an "optimal period" for the development of prerequisites for the articulation of visual motor processing skills.

Cluster 6B (BENVR, SEPTAV, P/F) comprises the scholastic achievement scores, linked at L8, with BENVR chained in at L7. The multiplicity of abilities required to succeed at school are linked closely to visual memory functioning. Thus visual perceptual processing skills, whether expressed through motor behaviour or memory function, are central to successful cognitive functioning of these children, where the success is measured in terms of their achievement at school.

4.6.5 CLUSTER ANALYSIS OF 21 CHILDREN (CASES)

The cluster analysis of "entities" is a procedure that allows for a flexible interpretation of how the "entity" is to be defined. Thus it is possible to use the same data source, but specify whether the clustering is to occur for the variables measured, or for the cases/individuals who provided the measures. A Cluster Analysis of Cases links those cases (children) most similar, along the dimensions specified by the variables (observations) measured, using identical procedures to those mentioned previously.

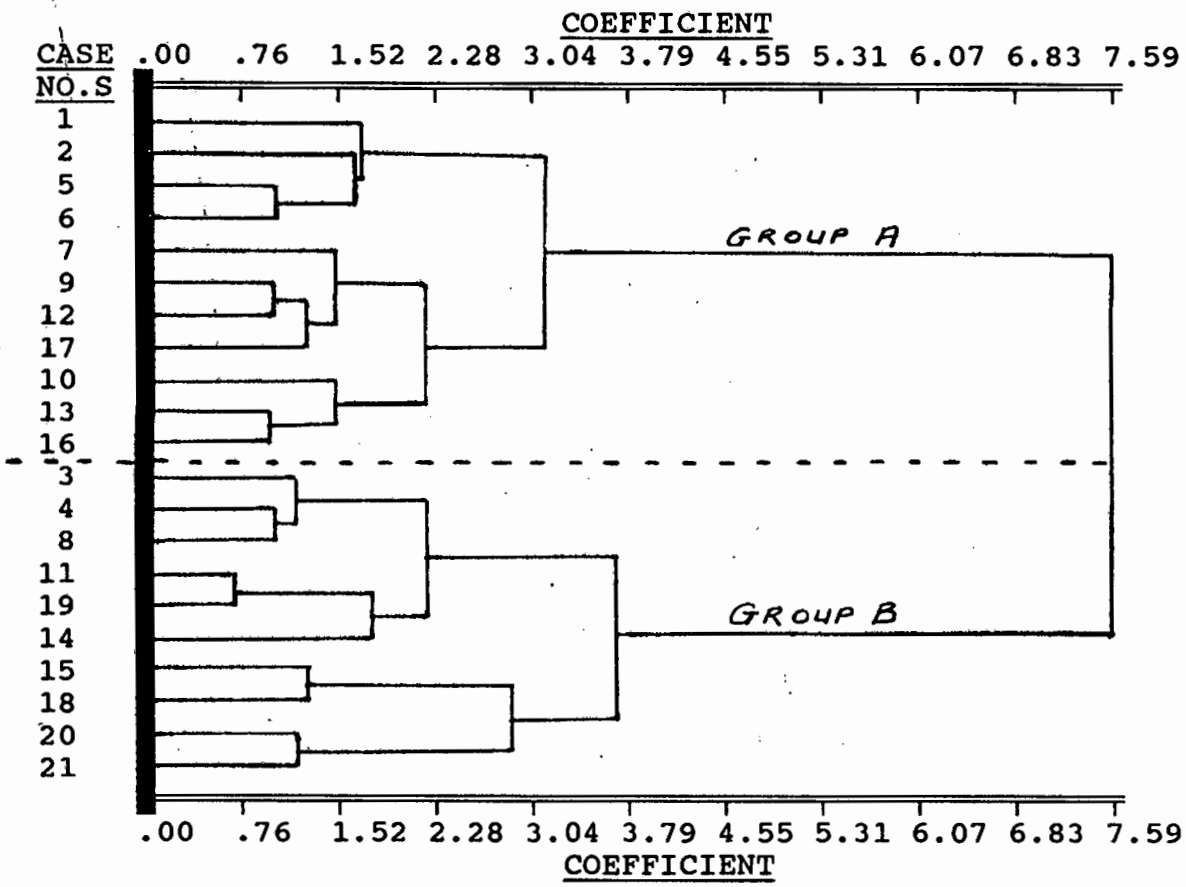
The Cluster Analysis of Cases was completed using the 38 selected variables. Two dendrograms were obtained, firstly from the BMDP Package (1983), which employed a preassigned Euclidean distance measure using standardized data and formed clusters using the single linkage algorithm; and secondly from the CLUSTAN Package (1978) which used a distance co-efficient and

then Ward's Method to cluster the matrix. The two methods produced different dendrograms; not noticeably so at the lowest levels of linkage, but which assumed different profiles at the higher levels. On investigation the researcher decided that the dendrogram produced by Ward's method provided a more useful grouping of the children, with the establishment of 2 well defined groups (Refer Figure 4.6.5 [A], below).

The 2 groups in the dendrogram comprised 11 & 10 children respectively, and are identified as GROUP A (11 cases) & GROUP B (10 cases). The common characteristic of GROUP B is that 6 (60%) of the children failed their September term average. Only 1 (9.1%) child from GROUP A failed. Thus group membership can be conceptualised broadly in terms of whether or not a child is currently competent in a variety of skills which would contribute to scholastic success. The inclusion of the 4 children, noticeably younger, in GROUP B who <u>did not</u> fail the September term average (Case No.s 3, 4, 8 & 14), can be interpreted as a timeous warning sign, alerting administrators to the possibilities that these children require specialised programs, to prevent them repeating the pattern of scholastic failure, prevalent in GROUP B. The placement of Case 10 (the remaining child who failed the September terms average) in GROUP A suggests that he is capable of achieving scholastically, but is hampered by a lack of motivation associated with attention and concentration deficits.

FIGURE 4.6.5 [A]

DENDROGRAM PRODUCED FOLLOWING CLUSTER ANALYSIS OF 21 CHILDREN MEASURED WITH 38 VARIABLES USING WARD'S METHOD.



The usefulness of such an analysis, for assisting child care workers and administrators designate which children require educational/remedial assistance has been demonstrated. What remains to be achieved is the location of the specific areas of deficit, of children in GROUP B, so that each child is provided with a program to help him/her achieve his/her full potential.

4.6.6 COMMENT ON THE CLUSTER ANALYSIS

The preceding exploratory data analysis has provided some useful results, both in terms of selection of significant variable clusters, and detection of children (cases) who can be grouped broadly in terms of whether they are successful/not at school. The grouping of children who exhibit similar profiles should assist with the establishments of groups, if necessary. Unfortunately time did not allow for further analyses. It would be interesting to note the clustering configuration of children (cases) using only those variables in the 6 identified clusters, as input to a distance/similarity matrix.

A limitation of the hierarchical cluster analysis of variables relates to the restriction of initial linkage to high positive correlations. This excludes the descriptive variables AGE & AGEADM from inclusion in the "cognitive" group of clusters, since all significant correlations between these 2 variables and cognitive assessment tests reflected negative values, due to the consistently poorer performance of the older children.

4.7 SCHOLASTIC PROGRESS & BEHAVIOURAL PROFILES

4.7.1 SCHOLASTIC PROGRESS: PAST & CURRENT

The introduction to this research study stated that widespread disadvantages exist in institutionalised children, including cognitive deficiencies and academic failure. The first part of this section provides some descriptive statistics relating to the children's scholastic progress, in an attempt to explore the dimensions of their academic performance. The data sources for these statistics are responses extracted from the questionnaire related to scholastic history and behavioural problems (completed by child care workers in consultation with the children), the children's school reports after the third school term in 1987, and case history material gleaned from the social worker attached to the home.

Only 3 children in the sample (15%), whose mean age was 9 years & 10 months, showed no history of school failures. (1 child was excluded from the sample for statistical purposes related to school failure, as he only started school in 1987.) According to case history records 10 children (50%) have failed once; 5 children (25%) have failed twice; and 2 children (10%) have failed 3 times.

Of the 17 children who failed once, or more, 64.7% failed before committal to Annie Starck Village, and 35.3% have failed whilst resident at the home.

It is difficult to establish a breakdown of the reasons for failure, due to inconsistent methods of recording this information. However, for the 64.7% of children who failed before arriving at the home, a clear picture emerged from their case history files of family lives fragmented by substance abuse, bereavement and violence, where lack of supervision regarding school attendance probably accounted for the most frequent reason. Poor attendance during impressionable early years undoubtedly nurtures a host of negative motivational attitudes to schooling.

Table 4.7.1 [I] summarises the profiles of the 17 children who were recorded as failing.

TABLE 4.7.1 [I]

ANALYSIS OF SCHOOL FAILURES

1 FAILURE	2 FAILURES	3 FAILURES
4 failed Sub A	1 failed Sub A & B	1 failed Sub A B & Std 1
2 failed Std 1	1 in Sub A & Std 1	1 failed Stds 1 2 & 3
1 failed Std 2	1 in Sub A & Std 2	
2 failed Std 4	1 in Sub B (twice)	
1 failed Std 5	1 in Sub B & Std 1	

NO. CHILDREN FAILING:	
SUB A	8 (32%)
SUB B	4 (16%)
STD 1	6 (24%)
STD 2	3 (12%)
STD 3	1 (4%)
STD 4	2 (8%)
STD 5	1 (4%)

Sub A & B account for 48% of the failures and if Std. 1 is included the lowest 3 classes account for a staggering 72% of the total failures. These statistics provide a stark picture of few children failing in the higher standards, which suggests that most children arrive at school inadequately prepared for experiences that should offer them opportunities to acquire the tools of literacy, as a prerequisite to mastering more complex skills demanded by various occupations and activities.

Child care workers questioned about the study habits of children in their care responded in the following way:

* 2 children were not included in responses to this question, due to their recent arrival, and being in Sub A & B.
* 9 children were recorded as showing "Disciplined" study habits, although 2 of these children failed the September term average.
* 4 children were recorded as being "Exceptionally hardworking", although 2 failed the September term average.
* 6 children were recorded as showing "Irregular" study habits. 3 of these children failed their September term average.

These responses indicated an inconsistency between the degree of scholastic success and the children's study habits.

Child care workers indicated that 10 children experienced "Good" relationships with their teachers; 9 had "Fair" relationships and 2 were recorded as "Bad".

The children were asked to indicate their "Best" and "Worst" subjects. Table 4.7.1 [II] summarises their responses to these questions.

TABLE 4.7.1 [II]

CHILDREN'S CHOICES OF BEST/WORST SUBJECTS

SUBJECTS	SELECTED AS BEST SUBJECT BY	SELECTED AS WORST SUBJECT BY
Afrikaans	8 children	8 children
English	5 "	11 "
Mathematics	7 "	10 "
Science	4 "	2 "
Content subjects	1 child	4 "
Total subjects	25	35
Not indicated by	1 child	2 children

Some indication of the children's attitudes to school learning is reflected in the fact that although 1 less child responded to the "Worst subjects" question, 29% more subjects were listed for this category.

Seven of the 21 children (33.3%) failed their September 1987 term average (mean age 14 years 10 months). Two of these children although included in the "younger group", are transitional between the "older" and "younger" groups. The remaining 5 are all older children.

A selection of comments by the children's class teachers were extracted from their September 1987 school reports. These are

included, to provide some insights about teachers' perceptions of the children's scholastic achievements:

* Case No. 2 (Sub B): Meer aandag in sinne en wiskunde.
* Case No. 8 (Std. 2): M. worked well. She must spend more time on her content subjects.
* Case No. 10 (Std. 4): S. druip al sy vakke. Hy gaan definitief aan die einde van die jaar druip as hy nie 2-3 ure elke dag studeer nie.
* Case No. 12 (Std. 3): No interest in improvement.
* Case No. 19 (Std. 5): Druip groot totaal deur 1%.
* Case No. 20 (Std. 5): Sy sal nou baie harder moet probeer.

Child care workers indicated that no children have received remedial assistance at school, or at the home. It is hoped that the results of this study will indicate a very real need exists for enrichment programs to help certain children, if the high incidence of scholastic failure is to be confronted.

Finally it is encouraging to notice the fact that so many of the children participate in extra-mural activities, for they provide opportunities for the development of interests and skills outside the school environment. The range of activities included (G = Girls; B = Boys):
Cubs (3B); Brownies (1G); Girl Guides (5G); Boy Scouts (1B); Ballet (1G); Modern Jazz Dance (3G); Karate (1G, 2B); Soccer (6B).

Only 2 children, were recorded as pursuing no extra mural activities. The keen interest in soccer shown by the adolescent boys in particular, is reflected in the fact that 6 of the 11 boys play soccer for a local club.

4.7.2 BEHAVIOURAL PROFILES

Reference was made in the Introduction to the prevalence of social and emotional problems associated with the institutionalised child. In an attempt to present a multi-faceted picture of the children's functioning in the Annie Starck Village environment a study was made of their behavioural profiles, to complement the information on their cognitive development and achievements.

What should be remembered is the fact that the behaviours comprising the profiles are defining the negative spectrum. This is due to the explicit request on the questionnaires that the child care worker indicate which behaviours they considered constituted a problem with a particular child. A copy of the Scholastic History and Behavioural Profile Questionnaire is included in Appendix II, Annexure A. (Refer to section 2.6 - Data Collection - regarding problems associated with obtaining consistent and accurate responses for this questionnaire.)

The Behavioural Profile Questionnaire included provision for 26 possible behavioural problems. A spreadsheet of those

behavioural problems present provided the data matrix to select both those children (i.e. rows), and those variables (i.e. columns), whose frequency of occurrence contributed significantly to the total occurrence of behaviours specified as problems, by the child care workers who worked closely with the children.

4.7.2.1 FOCUS ON THE BEHAVIOURAL VARIABLES

The data matrix comprised 26 columns, representing those behaviours listed in the questionnaire. A total frequency of 108 problem behaviours were recorded, for the 21 children in the sample. Only 1 column (variable) recorded no responses (Var. No 11 (a) - Asks embarrassing questions). The remaining variables occurred in between 1 to 10 children, 13 of them occurring in 5 or more children. These 13 variables are listed in Table 4.7.2 [I] below. The occurrence of the variable "attention seeking" at the top of the frequency distribution would come as no surprise to the Social Workers attached to the home, for this behaviour was often referred to in meetings as a characteristic of the children's behaviour.

It is interesting to note that in grouping the responses related to Anxiety (Var. No.s 13 a+b+c) the total frequency (15) accounts for the largest number of occurrences (14%) for any one item. These frequencies show a greater prevalence amongst the older boys (46.6% of the 15), with the younger boys and older girls contributing equally to the remainder.

TABLE 4.7.2 [I]

13 MOST FREQUENTLY OCCURRING BEHAVIOUR PROBLEMS

VAR. NO.	DESCRIPTION	FREQUENCY: (No. of children)	(% of sample)
6	Attention seeking	10	48%
14	Moody	10	48%
4	Very active	8	38%
13b	Anxiety - Worried	8	38%
7b	Impatient	6	29%
8	Aggressive	6	29%
15	Discipline problems (in the cottage)	6	29%
16	Discipline problems (in the school)	6	29%
18a	Truanting - Before committal to ASV	6	29%
12a	Carelessness - With dress	5	24%
12b	Carelessness - Hygiene	5	24%
13a	Anxiety - Specific fears	5	24%
18b	Truanting - After committal	5	24%

No younger girls were recorded as exhibiting problems related to Anxiety. Specific fears (13a) related to concern expressed by the children about:

* the child's family, both regarding their physical and economic well being, as well as feelings related to a lack of identity and non existence of "Roots";
* school, a sense of being different from other children at school, lack of achievement at school and generally unhappy about attending school;
* sleeping alone or being in the dark;
* "the future", a characteristic concern of the older children, and one that pervaded items 13 a, b & c.

Responses for 13b indicated that the younger children were worried about their mothers, the older children about

"the future". Variable 13c' responses echoed 2 older boys fears about "the future".

A developmental pattern emerged regarding those areas where anxiety is expressed. The younger children unfailingly felt concerned about their families, and mothers; locating the object of their concerns in historical or current life events. By contrast, the older children (and especially the older boys) expressed feelings of anxiety regarding the future. Interesting speculative developmental hypotheses could suggest links between these two trends; interpretive aspects of the behavioural profiles will be left until the end of this section (4.7.2.4).

Any further analysis of the behavioural variables intrudes into the domain of the children themselves, thus further comment will be reserved for the section below.

4.7.2.2 FOCUS ON THE CHILDREN (CASES)

Eme's (1979) comprehensive review of research on sex differences in childhood behaviour disorders showed that males were found to outnumber females in every major category, including adjustment reactions, antisocial disorders and learning disorders. The male child appears to be more at risk for maladjustment than the female child.

It is interesting to note that the mean frequency of behavioural

problems for the younger group of children was 4; for the older group 6.4. When the variable of sex was introduced to further stratify the sample the following frequencies were observed:

FREQUENCY OF BEHAVIOURAL PROBLEMS IN DIFFERENT GROUPS OF CHILDREN

	BP %		BP %	TOTAL %	
Younger Girls	13.0%	Older Girls	30.6%	43.6%	(GIRLS)
Younger Boys	27.7%	Older Boys	28.7%	56.4%	(BOYS)
TOTAL% (YOUNGER)	40.7%	(OLDER)	59.3%	100.0%	

(NOTE: BP % = Frequency of behavioural problems for the group, expressed as a percentage of the total frequency, of 108.)

An analysis of the 13 variables listed in Table 4.7.2 [I] above, shows that 10 of the 13 variables occurred in a greater proportion of older children, whilst the 3 remaining variables (No.s 6, 7b & 18a) are equally distributed between the younger and older groups. The 2 variables which displayed a marked discrepancy (4 more children in the older group) were:

No. 13 (b): Anxiety; generally worried
{6 older : 2 younger}

No. 15: Discipline problems (in the cottage)
{5 older : 1 younger}

The mean frequency of behaviour problems for boys (5.5) and girls (4.6) exhibit the sexual differences noted above. These differences are amplified when the 13 selected variables are examined. Seven of these 13 variables occurred more in the group of boys (Var. No.s 4, 7b, 8, 13a & b, 18a & b); 4 of the 13 occurred more in the group of girls (Var. No.s 12a & b, 14 & 16); and 2 showed equal distribution between the sexes (Var. No.s 6 & 15).

Thus whilst the frequency percentages noted in the table above show evidence of a higher proportion of problems in the older girls group, a focused examination of selected variables with relatively more frequencies (defined as occurring in more than 4 children), shows that the boys (both younger & older groups) exhibit a relatively greater number of problems.

The behavioural data was summarised by using a Block Clustering Technique for categorical data.

4.7.2.3 BLOCK CLUSTERING OF 21 CASES & 26 VARIABLES

The goal of the Block Clustering Technique for categorical data is to represent as succinctly as possible the data by a few large blocks with corresponding block modal values, together with residual single blocks consisting of single values deviating from the appropriate block modal value (Hartigan & Engelman, 1983, p. 474). Each block is defined by a cluster of cases and a cluster of variables, such that each variable in the block is constant over the cases in the blocks. Use was made of the BMDP program P3M (1983) to produce a block symbol data matrix.

The input to the Block Clustering program consisted of 26 behavioural variables, for 21 cases (children). 25 of these variables comprised the designated problem areas specified in the questionnaire. Variable No. 11a (referred to above) was

excluded, since no children "asked embarrassing questions". The 26th variable comprised the "P/F" variable, referred to in previous sections. This mnemonic is an abbreviation for Pass/Fail, and indicated whether the child had passed/failed the September term average. A failure was recorded as a 1; Pass as 0. For all the remaining variables the presence of a problem was denoted by a 1; absence by a 0.

The P/F variable was included for 2 reasons:
(i) to provide continuity with the main theme of this research, namely the cognitive functioning of these children; and
(ii) the marked discrepancy noted between the mean occurrence of behavioural problems for those children who failed (7.3) compared to those who passed (4.1) suggested a complex of behavioural problems surrounds scholastic failure.

This observation was also noted by Berman & Siegal (1976), whose research showed that 15- to 18-year old delinquents showed evidence of poorer performance on the WAIS & Halstead-Reitan Neuropsychological Battery. Sattler (1982) suggests that some individuals may become delinquent as a consequence of consistent failures, caused by deficits in adaptive abilities which are needed for success in society.

The Block Symbol Matrix produced by BMDP3M is reproduced in Table 4.7.2 [II], below. On examination it can be seen that a sequence of sometimes overlapping blocks was constructed, so

that each variable in a block is constant over the cases in the block, except for those cases belonging to later blocks in the sequence.

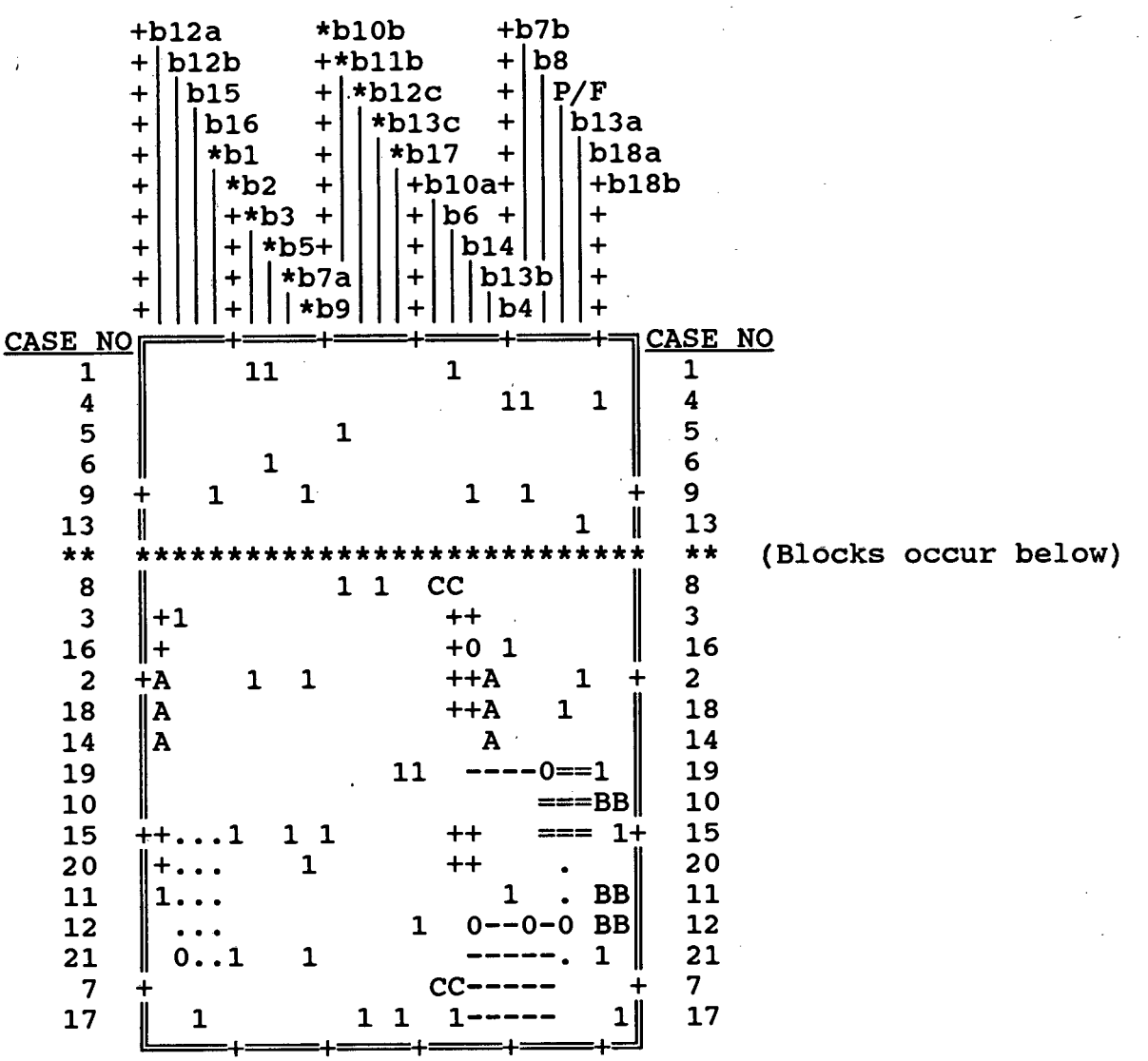
Blocks are identified by designated block symbols. The preassigned block symbols for the program are '.', '-', '+', 'A', 'B', 'C'. The largest block is set blank, so that the remaining blocks may be easily seen. Each single block is identified by the code for the values that define it.

Hartigan & Engelman state that a good clustering is one where the total block count "is a substantial fraction of the total number of data values" (1983, p. 475). The fraction obtained for this research yielded the following:
453 (Total Block Count) / 546 (Total number of data values) = .829. It would appear that "a good clustering" was obtained.

The minimum requirement for the formation of a block was set at 2 variables over 2 cases. It should be noted that those behaviour variables not contributing to the formation of blocks have been identified by placing an '*' before them, in the matrix. Similarly a line of '**' separates those cases incorporated in blocks (below the line), from those which were not (above the line).

TABLE 4.7.2 [II]

BLOCK SYMBOL CLUSTERED MATRIX



BLK	COUNT	VALUES	VARIABLE NUMBERS
	396	00000000000000000000000000	
.	13	.111.....1...	12b 15 16 P/F
-	17	.....11111....	14 13b 4 7b 8
+	12	1.....11.....	12a 6 14
=	5	.....111..	8 P/F 13a
A	4	0.....1.....	12a 13b (12a = 0)
B	4	11	18a 18b
C	2	.....11.....	10a 6
		....+....+....+....+....+.	

NO. OF SINGLETONS = 46

(BLOCK COUNT = No. of block symbols minus the no. of variables in the block)

In previous sections the children in the sample were divided into "younger" & "older" age groups, for comparative purposes. This division provided interpretive problems in the behavioural data section, for 3 of the older "younger" children (Case No.s 9, 10 & 11) are emergent adolescents, and exhibited attendant behavioural characteristics not associated with "younger" children.

An examination of the clustered symbol matrix shows that all, except 1, of the children above the '**' line are from the younger group (represented by the lower case numbers, 1 - 11); the older children featured in the more frequently occurring blocks '.', '-'& '+'. Case No.s 2, 3 & 10 appear in the less frequently occurring blocks ('=', 'A', 'B', 'C'); whilst Case No.s 7 & 11 are the only younger children featured in the more frequently occurring blocks. Case No. 15 featured the highest number of reported behavioural problems, appearing between the overlapping blocks '.' & '=, but also incorporating block '+'. It is significant to notice Case No. 15's placement in the matrix, for she was the only child who was described as "Solitary" (having no friends), and absconded soon after the assessments were completed. She also registered the highest cumulative error score on the Denckla NESS.

Program BMDP3M located 7 blocks in all. These are summarised in more readable language in Table 4.7.2 [III], below.

TABLE 4.7.2 [III]

SUMMARY OF BLOCKS IDENTIFIED IN THE BLOCK SYMBOL MATRIX

BLK	CASES	CASE NO.s	VAR.s	VARIABLE DESRIPTIONS
.	5	11 12 15 20 21	4	Carelessness (hygiene), Discipline problems in cottage & school, P/F.
-	5	7 12 17 19 21	5	Moody, Anxiety (generally worried), Very active, Impatient, Aggressive.
+	6	2 3 15 16 18 20	3	Careless (dress), Moody, Attention seeking.
=	3	10 15 19	3	Aggressive, Anxiety (specific fears), P/F.
A	3	2 14 18	2	Anxiety (generally worried), Not Careless (dress) i.e. = 0.
B	3	10 11 12	2	Truanting before & after committal to ASV
C	2	7 8	2	Talkative (too much), Attention seeking.

The variable P/F is linked both to the block symbol '.' & '='.

The behaviour variables associated with school failure are: Carelessness with hygiene, Discipline problems in the cottage & at school (Block '.'); Aggressiveness & Anxiety exhibited through specific fears (Block '='). These variables are present in the older children (Case No.s 15, 19, 20 & 21), including the "transitional" cases 10 & 11. Case No. 18 is the only child who failed, but is not included in these 2 blocks. She attained the second highest cumulative error score for the Denckla NESS and exhibited below age expectancy performance for all three scores on the Purdue Pegboard assessment, which suggests signs of neuro-motor dysfunction. Gaddes' (1981) comment that learning disabled individuals do not present a homogeneous group is borne out by the different behavioural, neuro-motor, cognitive and

motivational profiles that comprise "school failure" present in this analysis. Despite these complexities, an analysis of this nature could be useful in establishing groups of children who display similar profiles for behaviour modification programs.

4.7.2.4 BEHAVIOURAL PROFILES: A SUGGESTED INTERPRETATION

Research conducted by Rutter, Shaffer & Shepherd (1975) on behaviour disorders in childhood shows that they are relatively undifferentiated and have little continuity with adult neuroses. Sattler (1982) states that the major emotional disturbances specific to childhood and adolescence include anxiety and fearfulness, misery and unhappiness, sensitivity, shyness and social withdrawal, and relationship problems. He draws attention to the fact that those children who have experienced parental death are more likely to have heightened shyness, timidity and withdrawal; whilst children with histories of parental separation or divorce, are more likely to show aggression and acting-out problems (Felner, Stolberg & Cowen, 1975). "Each behavioral pattern can be viewed as a different resolution to early crisis experiences; the type of crisis may also be related to the type of school maladjustment" (Sattler, 1982, p. 413).

Kohn (1977) concluded that a vast amount of research suggests 2 major syndromes characterise emotionally disturbed children: (1) the apathy-withdrawal syndrome and (2) the anger-defiance syndrome. Both represent ineffective ways of coping with the

environment; for the first "flight", for the second "fight". Kohn's 5 year follow-up study of school children who had demonstrated difficulties during their pre-school years found that they had considerable academic difficulties, the apathy-withdrawn syndrome children experiencing the most. To account for his findings Kohn speculated that shy and inhibited children reduce their opportunities for learning by isolating themselves from contact with people, events and objects.

Research areas relating to specific parameters within this project have relied on the use of theoretical models for interpretive purposes. The behavioural profiles exhibited by children in this sample will be interpreted within the formulations of Erikson's developmental theories. Erikson's emphasis on the human capacity to triumph over the psychosocial hazards of living incorporates an optimistic approach which the researcher considered compatible with that of Feuerstein et al.'s cognitive model, whose emphasis on modifiability stresses possibilities for change.

Central to Erikson's theory of ego development is his assumption that human development is marked by a series of stages that are universal (Hjelle & Ziegler, 1976). The process whereby these stages evolve is governed by the epigenetic principle of maturation. This principle is explained by Erikson in the following way:

> (1) that the human personality in principle develops according to steps predetermined in the growing person's readiness to be driven toward, to be aware of, and to interact with, a widening social radius; and (2) that society, in principle, tends to be so constituted as to meet and invite this succession of potentialities for interaction and attempts to safeguard and to encourage the proper rate and the proper sequence of their enfolding (1963, p. 270).

Whilst the researcher endorses Erikson's first point, she has great difficulty accepting the second. It is the very failure of society constituted within the apartheid philosophy that provides physical and psychosocial obstacles which deter and distort, rather than encourage, a universal rate and sequence for unfolding potentialities.

Erikson outlined a sequence of <u>eight separate stages</u> of psychosocial ego development, which he postulated represent the epigenetic unfolding of a "ground plan" of personality that is genetically transmitted. Furthermore, Erikson postulated that each psychosocial stage is accompanied by a crisis, which he viewed as a critical turning point in the individual's life arising from physiological maturation and social demands made upon the person at that stage. The crisis is not a catastrophe, but a turning point, and therefore incorporates "the ontogenetic source of generational strength and maladjustment" (1968, p. 286). What is significant is that the person must adequately resolve each crisis in order to progress to the next stage of development in an adaptive and healthy manner. Thus

each stage builds upon the resolution and integration of the previous psychosocial conflicts. In view of this it is necessary to cover briefly the 3 earliest stages, before considering those of Stage IV & V in more detail.

STAGE I INFANCY: Basic Trust versus Mistrust - Hope

This first stage extends through approximately the first year of life, and Erikson considers the first major psychosocial crisis to relate to the quality of maternal care the infant receives. Unreliable, inadequate and rejecting qualities will result in the fostering of a psychosocial attitude of fear, suspicion and apprehension in the infant toward the world in general and people in particular. Conversely adequate resolution of the crisis of trust does have major consequences for the future development of the infant's personality. The establishment of self-trust in mother enables infants to tolerate the frustrations that they will inevitably experience during subsequent stages of development (Hjelle & Ziegler, 1976).

The case history data presented at the beginning of the Results section (3.1.1) provides evidence of inadequate parenting in almost every case, albeit at the time of placement of the children in alternative care. It would appear safe to assume that the majority of these children have experienced "unreliable, inadequate and rejecting qualities" in infancy, and the inadequate resolution of the

crisis of trust suggests a limited tolerance of frustration at later stages of their lives. This could partly account for the high level of aggression exhibited by certain children.

STAGE II EARLY CHILDHOOD: Autonomy versus Shame & Doubt - Will Power

This period roughly spans the second and third years of life. Muscular maturation sets the stage for an ambivalent set of social modalities - holding on and letting go. As the child rapidly gains neuromuscular maturation, verbalisation and social discrimination, she begins to explore and interact with her environment more independently. The resulting sense of self-control without loss of self-esteem Erikson saw as the ontogenetic source of confidence in free will; with a sense of overcontrol and loss of self-control giving rise to a lasting propensity for doubt and shame (Erikson, 1968).

There is little significant concrete evidence in the case history data that could provide insights into how the children resolved this stage. Lack of parental supervision would have allowed the children relative autonomy; although the reference to bedwetting amongst younger children in the sample could suggest a presence of shame related to lack of neuromuscular control.

STAGE III PLAY AGE: Initiative versus Guilt - Purpose

This stage extends from about the age of four to entry into formal school, and sees the child mastering new tasks and skills. Children begin to assume additional responsibilities for themselves, and for that which comprises their world. They become interested in others and trying out new things. The child begins to feel that he should be counted as a person, and the dominant theme is "I am what I will be", during play especially. Successful development in this stage leads to a "goal-directedness" in the child's behaviour. Guilt stems from the lack of opportunities of the child to complete tasks on her own; or as a result of parents employing excessive verbal/physical punishment in response to the child's urge to love and be loved by the opposite-sexed parent. Erikson viewed the resolution of this stage as significantly associated with the child's future potential to work productively and achieve self-sufficiency within the context of society's economic system.

Case history data provided examples of two extremes within the continuum of possible positive and negative resolutions of the intiative-guilt spectrum, albeit at somewhat older chronological ages. The first related to the initiative pole, and suggests that many children were forced, through lack of parental supervision and care, to resort to using their own initiative to survive. This included begging for

food, and in a case of 2 siblings, taking to the road; where they abused solvents, stole (particularly with older boys) and even sold newspapers. Negative resolutions are most probable in cases where children were physically abused, particularly associated with bouts of excessive alcohol consumption. A significant dimension associated with the emergence of goal-directed behaviour relates to the need for the child to learn to discriminate between socially acceptable and unacceptable goals. The family functioning of most children's home environments would not have provided adequate role models or guidelines in this respect.

STAGE IV SCHOOL AGE: Industry versus Inferiority - Competency.

The fourth stage occurs from about six to eleven years of age ("school age"). According to Erikson it is in this stage that for the first time the child is expected to acquire the rudimentary skills of the culture via formal education, e.g. learning to read, write, and co-operate with others in structured activities. This learning process is associated with the child's increased capability of deductive reasoning, self-discipline and relating with peers according to prescribed rules. Although the kind of instruction offered children may vary with the culture, Erikson conceived this stage as sensitising the children to the technological ethos of their culture and their identity

with it. The major developmental theme of this stage is "industry", for children become preoccupied with the manner in which things are made and operate. The child's ego identity becomes "I am what I learn". The negative potential exists of children developing a sense of inferiority or incompetence during this stage, especially if they doubt their skill or status among peers; or establish negative attitudes towards teachers and learning, which discourage them from pursuing further learning. Hjelle & Ziegler (1976) note that a sense of inferiority may also develop if children discover that their "sex, race, religion, or socioeconomic status - rather than their own skill and motivation - is what determines their worth as persons.

The preceding section (4.7.1) related to scholastic progress provided ample evidence of children confronted on a daily basis with the potential development of a sense of inferiority or incompetence. Much of this is a product of inadequate early-childhood experiences; the impact of a lack of mediated learning experiences has been explored, and the invasive significance of resulting perceptual organisational deficits illustrated in the cluster analysis of variables. The obvious opportunities presented by this information relate to whether continued participation in a school system, which does not meet the specialised needs of the majority of these children will benefit their personal

development ? Alternatively, since the creation of a different school environment geared to meeting these children's needs could be beset with numerous difficulties, the provision of programs within the home itself, aimed at improving weak areas by teaching through existing strengths, could provide a more pragmatic approach to developing a sense of both personal and interpersonal competency in children who show evidence of school failure.

STAGE V ADOLESCENCE: Ego Identity versus Role Confusion - Fidelity

This stage of the life cycle is roughly between the ages of 12/13 and 20 years. The crisis confronting adolescents is to consolidate all the knowledge gleaned over previous stages about themselves, integrate the various self-images into a personal identity that shows awareness of a past and of a future which extends logically from it. Erikson's definition of "Ego Identity" reveals three elements, viz.:

i) the individual must perceive himself as having "inner sameness and continuity"; i.e. he must, over time, experience himself as essentially the same person as he has been;

ii) the persons in the individual's social milieu must also perceive a "sameness and continuity" in the individual, thus validating the adolescent's own feelings of inner unity; and

iii) the adolescent needs to establish "accrued confidence" through appropriate feedback of self-perceptions from interpersonal experiences.
(Hjelle & Ziegler, 1976, p. 72)

The 3 requirements above set stringent demands for children whose inner "sameness and continuity" are challenged initially by fragmented family situations, and subsequently by foster care break down and child care worker staff turnover, which provide obstacles to the validation and development of "accrued confidence", through appropriate feedback from their social milieus.

Erikson also maintained an essential task of adolescence is the establishment of an appropriate adult sex role. He stated that an adolescent's uncertainty regarding his self concept and social image results in feelings of doubt, confusion and apathy.

The failure of a young person to develop a personal identity due to unfortunate childhood experiences, or present social circumstances, Erikson termed the "identity crisis". He stated that many adolescents who are in the throes of this age-specific conflict most often are concerned about career choices; and feelings of inadequacy, depersonalisation, and alienation are the product of the

profound sense of futility, personal disorganisation and aimlessness which the individual experiences.

Evidence of the uncertainty experienced by the adolescents in this sample is reflected in their reported anxieties related to the future, in their behaviour profiles.

The "negative identity" sought by some adolescents who display delinquent behaviour, is viewed by Erikson as an attempt to establish adequate personal identity which is opposite to that prescribed by parents, peers, or supervisors. "Negative identity" appears to provide a solution to certain of the adolescent boys in the group, who truant in gangs.

Many of the behavioural problems represent an accumulation of unresolved conflicts from earlier stages. The challenge exists to create an awareness in child care workers, potential foster parents and teachers alike of the reasons for the children displaying such problems; and afford the children the social opportunities to explore dimensions of those conflicts which remain largely unresolved.

5. SYNOPSIS OF THE RESULTS

The preceding two chapters presented the results of the neuropsychological assessment parameters of the 21 children comprising the research sample. Each assessment parameter was considered separately, and an attempt to integrate certain parameters using cluster analysis techniques focused firstly on the variables (measures) chosen, and then on the children (cases). Hierarchical agglomerative classification proved a useful data reduction tool, considering the diverse sources of input data, both in terms of the assessment measures and the ages and characteristics of the children.

The exploratory cluster analysis of 38 "mixed" assessment and descriptive variables provided valuable process information regarding the interaction of test measures employed in the assessments. The characteristics of particular clustering configurations noted were interpreted in the light of current research findings in the field of assessment of culturally deprived children. These features confirmed previous research findings, and accentuated the need to exercise extreme care when using tests designed for culturally advantaged groups, within a static assessment paradigm. Feuerstein and associates' model of

cognitive functioning (1979, 1980) provided an invaluable framework for the interpretation of test results, catering for the characteristics of the research sample, and the inappropriateness of normative data in many instances.

The dynamic interplay between the characteristics of the research sample and the assessment dimensions, captured by the cluster analysis of 38 selected variables, provided suggested guidelines for selection of tests in future assessment batteries. This information should prove valuable to child care administrators, currently inundated by the weight of the problem of scholastic failure of children in alternative care, and in need of abbreviated assessment schedules that reap maximal use of data harvested.

The cluster analysis of the children using the 38 selected variables provided a useful means of classification for the purposes of separating two groups, viz. those currently successful scholastically (Group A), and those not (Group B). The inclusion of 4 younger children who are currently passing at school in the scholastically unsuccessful group suggests that these children are at risk of developing similar patterns of scholastic failure. Similarly, the one child who is currently failing, but included in the scholastically successful group, suggested that reasons for his failure related more to problems of motivation and negative attitudes to schooling. Whilst these problems occur in a number of the children those children included in Group B exhibited more specific cognitive

deficits that require specialised remediation / enrichment programs.

Visual processing ability proved a significant determinant of success across a range of tests, and stressed the need to ensure that the children's visual acuity is regularly checked.

Denckla's NESS was excluded from the cluster analyses, due to problems associated with establishing scoring categories and the lack of normative data, but the cumulative error profiles suggested that a high incidence of neuro-motor involvement is present in these children. The relatively high correspondence between neuro-motor involvement and scholastic failure indicated that whilst this assessment is not sufficient to diagnose those who are currently failing at school, the data yielded provides invaluable information which should assist in planning remediation programs for individual children; especially where characteristics of impulsiveness and a high level of activity are prevalent, accompanied by low attentiveness.

Reading and spelling assessments indicated that 33.3% of the sample exhibited below average performances across all 3 UCT tests. These linguistic assessments proved to be unrelated to the remaining cognitive assessment measures; a feature borne out by their relative isolation from other cognitive and scholastic variables in the cluster analysis, as well as the fact that whereas the older children were identified as yielding more poor performers in other assessment parameters, the younger children

formed a significant number of below average performers in the reading and spelling assessments. Both reading and spelling error analysis suggested that the development of phonic decoding skills should improve deficit areas.

An interesting perspective offered by the cluster analysis of variables related to the pervasive intrusion across both semantic and figural test content of a deficient "perceptual organisation" factor. This feature confirms the existence of a variety of deficient cognitive functions exhibited by the children (identified by Feuerstein et al. (1979)), operating at the Input processing level, in particular.

The link between more competent visuographic functioning and exposure to a pre-school environment, suggested in the analysis of results, was confirmed by the inclusion of the descriptive variable YRSPSK in the predominantly visuo-motor cluster. The emphasis on the figural aspects of perceptual organisation in this cluster (Cluster 6A) suggest that those children benefitting from the mediated learning experiences offered at pre-school, who also happened to be those children admitted at an earlier age, enjoy an advantage over both those children who were not exposed to pre-school environments, and were admitted to the home at an older age. This confirms the importance attached by Feuerstein & Rand (1973) to the child's exposure to "mediated learning experiences".

The Personal Parameter yielded information of the children's heights and weights. The low percentile standing of most children in the sample is in keeping with other research in this field. Whilst specific hypotheses were not expounded relating the children's neuro-motor development to their height and weight profiles, it would appear that there may well be a link between these measures.

Personality functioning was explored briefly, using a self report self concept scale, and projective techniques. The children on the whole exhibited positive self concepts, although the dimension relating to their competence at school work received more negative evaluations. This is not surprising, given the findings of this body of research.

What seems crucial is that the school system <u>does not currently cater for the special needs of this group of children</u>. It would appear that having identified their needs the responsibility for instituting remedial programs rests at this point with child care administrators. This research project lacks input from the school system; an acknowledged deficiency, but one that could not be overcome, due to current government policy restricting access to the 'Coloured' school system, and information that could be construed as potentially politically contentious material. What is clear is that specific assessment measures have focussed on specific deficits for a number of children, and the sooner remediation programs are instituted the

greater the chances of success over a wider range of neuropsychological dimensions.

The block clustering of children and behavioural problems exhibited by them provided condensed information of both the prevalence of the most frequently occurring problems, and the clustering of children exhibiting those problems. This accentuated the complex overlay between the cognitive / scholastic parameters, and those of personality functioning. The clustering of children suggests groupings of those children who exhibit similar profiles, which could be useful for establishing behaviour modification programs.

Finally, it remains imperative for the researcher to state that whilst the anonymity of data manipulation appears to strip the subjects participating in this project of their individuality, she would like to acknowledge and pay tribute to each child in the research sample. Their individual and collective contribution, embodied in this document, will hopefully yield insightful understanding and sensitive and creative management of not only their own, but also other children's lives, where life circumstances present similar developmental opportunities.

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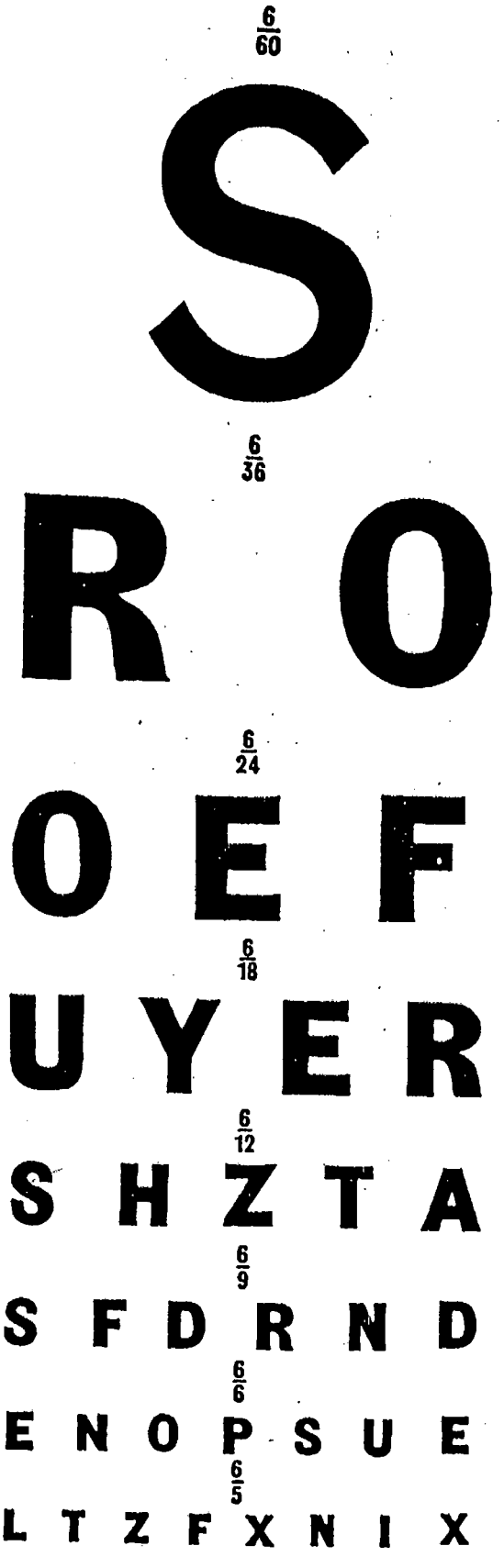


for the facilitation of a Medical Eye Examination

FOR INSTRUCTIONS—SEE OVER

APPENDIX I

Annexure Ai

REDUCED SNELLEN

Equivalent to

6/60	T	V	O
6/36	X	H	A
6/24	A	X	T
6/18	H	O	U
6/12	x	u	H
6/9	t	o	v
6/9	n	x	u
6/6	o	v	n
6/6	t	v	n
6/4			
6/4			

The Revised Sheridan Gardiner Test

Keeler

APPENDIX I

Annexure Aii

S & M TOETS VIR OUDITIEWE DISKRIMINASIE

Naam: ..... Ouderdom: .....
Datum: ..... Foute: ..... Oud. ouderdom .....

Ek gaan woorde aan jou lees - twee woorde elke keer. As die twee woorde presies dieselfde is, dan sê jy "dieselfde" (of knik jou kop). As die twee woorde nie presies dieselfde is nie, dan sê jy "anders" (of skud jou kop).

Luister nou hierna: man ... man. Het ek dieselfde woord twee keer gesê of is dit twee verskillende woorde ?

Kom ons probeer nog 'n paar: nat ... kat. Wat van hierdie paar: is hulle dieselfde of anders ?

(As ondersoeker meen dat die kind nog onseker is, gaan voort deur die volgende pare te gebruik: fraai ... kraai; hond ... hond; lek ...nek)

1	glips - gips	..	21	klik - klip	..	41	laas - haas	..
2	hurk - kruk	..	22	braai - blaai	..	42	sing - sing	..
3	draad - draad	..	23	bas - baas	..	43	kwaai - kwaai	..
4	skink - skink	..	24	pit - pik	..	44	hap - hak	..
5	warm - darem	..	25	sal - salf	..	45	skeel - steel	..
6	erg - erf	..	26	klomp - klont	..	46	hooi - gooi	..
7	leeu - leeu	..	27	piets - fiets	..	47	boer - boer	..
8	haal - haar	..	28	boks - boks	..	48	ryp - rys	..
9	stil - skil	..	29	spot - spog	..	49	laag - leeg	..
10	hek - rek	..	30	bang - wang	..	50	mens - wens	..
11	sterk - sterk	..	31	reën - reën	..	51	skoon - skoon	..
12	krag - kras	..	32	dit - dip	..	52	tas - das	..
13	wolk - wol	..	33	te - tik	..	53	trap - krap	..
14	spruit -spuit	..	34	gryp - gryp	..	54	bruid - bruin	..
15	fees - wees	..	35	soe - soet	..	55	speel - speel	..
16	melk - melk	..	36	swel - spel	..	56	graan - kraan	..
17	plaat -plaas	..	37	bos - pos	..	57	put - pot	..
18	sous - sou	..	38	geel - geel	..	58	niks - niks	..
19	klap - knap	..	39	klink - klim	..	59	hik - hoek	..
20	vaak - vaak	..	40	deur - duur	..	60	jag - jig	..

APPENDIX I
Annexure Bi

WEPMAN TEST FOR AUDITORY DISCRIMINATION

Name: ..... Age: .....
Date: ..... Errors: ..... Aud. age .....

I am going to read some words to you - two words at a time. If the words are exactly the same, you say "same" (or nod); if they are not exactly the same, you say "different" (or shake your head).

Lets try a few pairs for practice: man ... man. Did I say the same word twice or two different ones ?

Lets try another pair: hat ... pat. What about that pair, were the words the same or different ?

(If the examiner feels he is still confused, continue using the following word pairs: pass ... path; walk ... walk; dog ... hog.)

1	gear - beer	...	21	bar - bar	...
2	cad - cab	...	22	bum - bun	...
3	led - lad	...	23	lave - lathe	...
4	thief - sheaf	...	24	shot - shop	...
5	sake - shake	...	25	wedge - wedge	...
6	jail - jail	...	26	suck - sock	...
7	ball - ball	...	27	vie - thy	...
8	lake - lake	...	28	rich - rich	...
9	bead - deed	...	29	pit - kit	...
10	rub - rug	...	30	guile - dial	...
11	wing - wing	...	31	rash - wrath	...
12	gall - goal	...	32	chew - chew	...
13	pot - pit	...	33	fag - sag	...
14	lit - lick	...	34	phase - phase	...
15	bug - bud	...	35	sick - thich	...
16	lass - lath	...	36	wreath - reef	...
17	cope - coke	...	37	map - nap	...
18	pool - tool	...	38	muss - mush	...
19	zone - zone	...	39	cart - tart	...
20	fret - threat	...	40	cuff - cuss	...

APPENDIX I
Annexure Bii

Scoring for Physical and Neurological Examination for Soft Signs (PANESS) 8/1/85

NAME: _____ ID: _____

BIRTHDATE: _____ DATE EXAMINED: _____

PRESENT AGE: _____ EXAMINER: _____

Lateral Preference Pattern
"Show me how you . . ."

Circle "R" or "L" after each item

1.	EYE:	Look through hole in paper	L R	*Code EYE:* R L
2.	FOOT:	Kick ball	L R	
		Stomp out fire	L R	*Code FOOT:* R L Mixed
3.	HAND:	Comb hair	L R	
		Brush teeth	L R	
		Cut with scissors	L R	*Code HAND:*
		Throw ball	L R	R ____
		Hit ball with bat	L R	
		Hit ball with racket	L R	L ____
		Hammer	L R	
		Use screwdriver	L R	Mixed ____
		Saw	L R	*(If less than 7*
		Flip coin	L R	*RIGHT or LEFT)*
		(Open door with key)	L R	

APPENDIX I

Annexure C

Gaits and Stations
(Sample 10 Steps)

Code number of times (out of 10 steps) child misses line or puts foot down flat

	Side		Overflow 0 = No 1 = Yes		Number of Errors			
4. Walks on heels					0	1	2	3
a. Hand postures present? (If YES, circle L or R)	(L)	(R)	0	1				
5. Walk on tiptoe					0	1	2	3
a. Hand postures present? (If YES, circle L or R)	(L)	(R)	0	1				
6. Walk on sides of feet.					0	1	2	3
a. Hand posture present? (If YES, circle L or R)	(L)	(R)	0	1				
7. Tandem walk (heel to toe) forward.					0	1	2	3
8. Tandem walk backwards.					0	1	2	3

Code period of uninterrupted success for 20 seconds (Use stopwatch.)

	Overflow 0 = No 1 = Yes		Seconds 20	19-15	14-10	9-0
			0	1	2	3
9. Sustentation postures/ stations. Put feet heel to toe, close your eyes, and stand straight until I tell you to stop.						
a. Tendency to fall?	0	1				
b. Arms out to balance?	0	1				

	Overflow 0 = No 1 = Yes		Seconds 20	19-15	14-10	9-0
			0	1	2	3
10. Sustentation/steadiness. Put feet close together, close your eyes, raise your arms out in front of you, spread your fingers apart, and stay that way until I tell you to stop.						
a. Occurrence of involuntary movement?	0	1				
b. Tendency to fall?	0	1				

Code 0 = No problem
1 = Misses nose, wobbles en route

	Overflow 0 = No 1 = Yes		Seconds 20	19-15	14-10	9-0
			0	1	2	3

Gaits and Stations (Sample 10 Steps) (Continued)

Code number of times (out of 10 steps) child misses line or puts foot down flat

11. Finger to nose.
    a. Before you open your eyes, touch your right index finger to your nose. 0 1
    b. Touch your left index finger to your nose. 0 1

12. Stick out your tongue until I tell you to stop.

Seconds			
20	19-15	14-10	9-0
0	1	2	3

    a. Occurrence of involuntary movement or occurrence of lapses? (Only score "reptile" tongue, not curling.) 0 1

Allow choice of first foot.
Code choice for items 13 and 14.

13. Stand on one foot until I tell you to stop
    Now stand on the other foot.

Side		Seconds			
		20	19-15	14-10	9-0
(L)	(R)	0	1	2	3
(L)	(R)	0	1	2	3

Code number of hops until child "touches down."

14. Hop on one foot.
    Hop on the other foot.

Side		Seconds			
		50	25-13	12-0	3-0
(L)	(R)	0	1	2	3
(L)	(R)	0	1	2	3

Gaits and Stations
(Sample 10 Steps) (Continued)

Code number of times (out of 10 steps) child misses line or puts foot down flat

For items 15-21 indicate time to do 20 taps. Circle side chosen first for each item. Code extraneous "overflow" movement. Code 0 if overflow is absent, 1 if present.

		TIME	PROXIMAL (CEPHALAD)	ORO-FACIAL	MIRROR	OVERFLOW	DYS-RHYTHMIA	SPEED* SLOW FOR AGE	UNABLE TO PERFORM**
15.	Foot tap	L: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
		R: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
16.	Foot heel toe tap	L: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
		R: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
17.	Hand pat	L: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
		R: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
18.	Hand pronation/supination	L: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
		R: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
19.	Finger tap	L: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
		R: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
20.	Finger succession	L: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1
		R: ____	0 1	0 1	0 1	0 1	0 1	0 1	0 1

Indicate time to do 10 sets

	TIME (for 10 sets)	OVERFLOW 0 = No 1 = Yes	SLOW FOR AGE** (If > 3 seconds)
21. Tongue wiggles Side to side	10 sets _____		
a. Jaw synkinesia?		0 1	1

Code TOTAL SCORE (Items 4 through 21) _____

*See attached norms
**Note: For items 15 to 21, If Unable to Perform = 1, then code 1 for Dysrhythmia and Slow for Age.

U.K. Leestoets

Naam _____

St. _____

Datum _____

Roupunt, Gegrad. _____

Skaalpunt " _____

Roupunt, Spoed _____

Skaalpunt, " _____

op in se ek hy
ons vir toe net die

ou af bly nog vra
uit te wel skrik brief

nooit mense kuier gestel nuwe
baie eier veral gesels mevrou

liddering aanraking klimaat hemele eenvoudige
skildery lewende menigte beoog beduie

sekere sowel begroting persentasie poging
hopelik nederige tariewe wetsontwerp geledere

wemelende pastorie onredelik oorsese prokureur
oorweging leningsrekening gekonsentreer begerige omgewing

kwoteer wesentjies aarselende naturel misrabel
mymerend simpatie sedert argivaris vereistes

munisipaliteit nomineer parodiek departementele verveling
redeneer deklarasie formule meerderes verordeninge

vergesel mediese gaoties ideëel karikatuur
suspisieus harmonium netelige amendement eksegese

ongeëwenaard wysgerige beëdigd winsgewende naiwiteit
geaffilieerde metodiek indiwidueel unaniem trigonometrie

monargie isometries isolasionisme koëffisiënt genealogie
geologies paleontologie chauvenisme pseudoniem psigoanalise

die en nie het 'n pas ken oop lig vas
van is in ek dit kos lag bo vat eet
te hy sy wat om wit uur min nag wal
vir was dat op ons vol dra oud vyf oog
my sal met as u wet lug nê rus vel
so aan toe kan jy mee ewe los ter ryk
nou sê dan na kom vet lus eer ses arm
hom ook by nog of hoë lei rug bed kar
al jou uit net se tel son dam pos vry
wil een oor tot ou rol jul wis nat fyn
hoe tog sou sit kyk ruk nes hek bou dik
ja gee kry dis bly lid hof wa pak eis
oom kon vra af hou vee wol ore ly dog
tyd dag hul man nee nek sin tye myl sag
weg lê lyk mos gou Mei dak ete lui mis
hê dus wie ma ag lyn pyp tak erg bad
wou wel dae reg mag bak bek dek elk gek
pa val oë eie wag had jas kat lae dig
pad end glo per wys bes gat hen kis lam
ten ver ry kop sak bid dik hol kla las

APPENDIX I

Annexure Di

U.C.T. Graded Reading Test

Name _____
Std. _____
Date _____
Raw Score, Graded _____
Scaled Score, " _____
Raw Score, Speed _____
Scaled Score, Speed _____

to is of at he
my up or no an

his for sun big day
sad pot wet one now

that girl went boys some
just told love water things

carry village nurse quickly return
known journey terror obtain tongue

shelves scramble twisted beware commenced
scarcely belief steadiness labourers serious

projecting fringe luncheon nourishment overwhelmed
urge explorer trudging events motionless

economy formulate exhausted contemptuous renown
universal circumstances destiny glycerine atmosphere

perpectual emergency humanity perambulating ultimate
apprehend exessively domineer theory reputation

physician fatigue philosopher melodrama qutobiography
constitutionally champagne encyclopedia hypocritical efficiency

melancholy exorbitant influential terminology palpable
mercenary contagion fallacious binocular microscopical

atrocious phlegmatic refrigerator unique alienate
eccentricity ingratiating subtlety poignancy phthisis

go	is	at	so	cat	sum	saw	pit	cap	hop
te	on	the	we	it	dad	hit	lot	lad	wee
he	in	of	my	an	ink	sad	set	Bob	eff
up	by	be	and	me	met	egg	nor	fan	cow
do	if	too	dog	as	lip	tea	ill	yet	fit
us	you	for	see	am	pay	beg	pop	sea	led
no	or	man	Tom	but	end	bag	lay	how	put
ran	ox	not	can	she	joy	ham	dot	buy	lit
mat	sun	has	boy	pen	far	log	new	fix	way
box	bat	bad	his	did	eat	fly	ram	mix	win
hat	pig	say	had	wet	yes	toy	tim	map	arm
sat	day	ten	rat	bee	bar	our	Jim	hip	hay
run	fox	jam	was	get	nut	rag	sin	sow	tub
sit	hot	big	hen	her	ice	why	ask	car	cry
out	all	men	top	red	gun	bid	sky	fin	rap
two	pot	bed	let	pat	rum	bun	jug	fry	dip
Sam	fed	fat	leg	got	jar	van	toe	cot	dim
Ned	pin	are	net	one	jet	tip	wit	rot	mob
cup	pet	pan	fun	may	mew	lap	lie	dig	tap
old	now	who	bit	six	oak	fog	air	vex	ark

S P E L T O E T S

Sê, „Hier is 'n speltoets. Luister goed en skryf elke woord langs sy nommer. Die eerste woorde is die maklikste. Doen julle bes en kry soveel woorde reg as moontlik. Die eerste woord is ‚en'. Skryf ‚en' hier, langsaam nommer 1. (Wys waar.) Langsaam nommer 2 skryf ‚ek'. Skryf nou ‚een'".

Die woorde word een-vir-een gelees, en die uitspraak moet heeltemaal duidelik en redelik stadig wees, sonder dat die woord egter in lettergrepe opgebreek word. Die woorde mag herhaal word indien dit wenslik geag word, maar hulle mag nie in 'n sin of sinsdeel geïllustreer word nie. Daar is geen tydbeperking nie.

Begin met die eerste woord en lees elke woord agtereenvolgens, totdat die proefpersoon alles verkeerd skryf. Die pn. hou op wanneer hy sien dat die drie beste leerlinge in die klas elk 10 agtereenvolgende woorde verkeerd geskryf het.

Puntstoekenning: Die getal regte woorde. Reggeskrewe alternatiewe homofone word aangeneem, en ook omgekeerde letters.

SPELLYS.

1 en	15 huis	29 oomblik
2 ek	16 word	30 meneer
3 een	17 stoom	31 bietjie
4 tot	18 deur	32 vader
5 kom	19 dink	33 goïdyn
6 as	20 lemoen	34 heuning
7 soos	21 baie	35 knopie
8 ook	22 tyd	36 vinger
9 my	23 diepte	37 droëwig
10 maar	24 seuntjie	38 vaarwel
11 nou	25 luister	39 paleis
12 wees	26 blomme	40 gelukkig
13 te	27 honger	41 skinkbord
14 byna	28 sement	42 muskiet

APPENDIX I

Annexure Ei

43 karretjie
44 ketting
45 skoenlapper
46 skaduwee
47 nêrens
48 plotseling
49 maniere
50 lessenaar
51 posseël
52 sofa
53 koevert
54 ondeunde
55 Februarie
56 rewolwer
57 kinkhoes
58 naelborsel
59 ontydig
60 wieletjie
61 lawaaierig
62 kleinserig
63 ruggraat
64 medisyne
65 familielewe
66 studeerkamer
67 verrassing
68 magistraat
69 langdurig
70 passasier
71 vereniging
72 leuenagtig
73 senuweeagtig
74 interessa nt
75 onmiddellik
76 karweier
77 juwelier
78 openinkie
79 herinnering
80 simpatiseer
81 meisieskool
82 vermoeienis
83 dynserig
84 eienares
85 verflenterde
86 reorganisasie
87 dwaasste
88 verfraaiing
89 toiingrig
90 oënskynlik
91 verbouereerd
92 bestrawwing
93 besproeiingskema
94 venynige
95 flikflooiery
96 genoeë
97 ruïneer
98 laboratorium
99 veiligheidsmaatreël
100 periodiek
101 insinuasie
102 meedoënloos
103 kolossaal
104 dissipline
105 soewereiniteit
106 offisieel
107 naturalisasie
108 majestueuse
109 possimisties
110 varkkarmenaadjie

N O R M E

Oud:	7				8				9				10			
Norme:	17	20	22	25	27	30	32	35	37	40	42	45	47	50	52	55

Oud:	11				12				13				14				15
Norme:	57	60	62	65	67	70	72	75	77	80	82	84	86	88	90	91	93

ENGLISH SPELLING

Say, "This is a spelling test. Listen carefully and write each word next to its number. The first words are easier than those that follow. Do your best and get as many right as you can. The first word is 'a'. Write 'a' on your paper next to number 1. (Show where). On Next to number 2 write 'it'. Now write 'cat'.

Each word has to be pronounced separately. The enunciation should be quite distinct and moderately slow, without any dislocation of the syllables. The words may be repeated if necessary, but they are not to be enshrined in an illustrative context. There is no time limit.

Begin with the first word, and read each word in succession until the subject breaks down completely. The examiner stops dictating when he sees that the three best pupils in the class have misspelt 10 successive words.

Scoring: The number of correct spellings. Alternative homophones are accepted, and so are reversals of letters.

A G E N O R M S

AGE:	7				8				9				10				
NORMS:	7	10	12	15	17	20	22	25	27	30	32	35	37	40	42	45	

AGE:	11				12				13				14				15
NORMS:	47	50	52	55	57	60	62	65	67	70	72	74	75	77	78	80	81

SPELLING LIST

	a	26	coming	51	surface	76	responsible
	it	27	sorry	52	pleasant	77	agricultural
	cat	28	done	53	saucer	78	intelligent
	to	29	lesson	54	whistle	79	artificial
	and	30	smoke	55	razor	80	peculiar
	the	31	money	56	vegetable	81	luxurious
	on	32	sugar	57	improvement	82	conceited
	up	33	number	58	succeed	83	leopard
	if	34	bright	59	beginning	84	barbarian
0	box	35	ticket	60	accident	85	occasion
1	run	36	speak	61	decide	86	disappoint
2	bad	37	yellow	62	business	87	necessary
3	but	38	doctor	63	carriage	88	treacherous
4	this	39	sometimes	64	rogue	89	descendant
5	will	40	already	65	receive	90	precipice
6	pin	41	rough	66	usually	91	virtuous
7	cap	42	raise	67	pigeon	92	memoranda
8	men	43	scrape	68	practical	93	glazier
9	got	44	manner	69	quantity	94	circuit
0	to-day	45	publish	70	knuckle	95	precision
1	table	46	touch	71	distinguish	96	mosquito
2	even	47	feel	72	experience	97	promiscuous
3	fill	48	answer	73	disease	98	assassinate
4	black	49	several	74	sympathy	99	embarrassing
5	only	50	towel	75	illegal	100	tyrannous

APPENDIX I

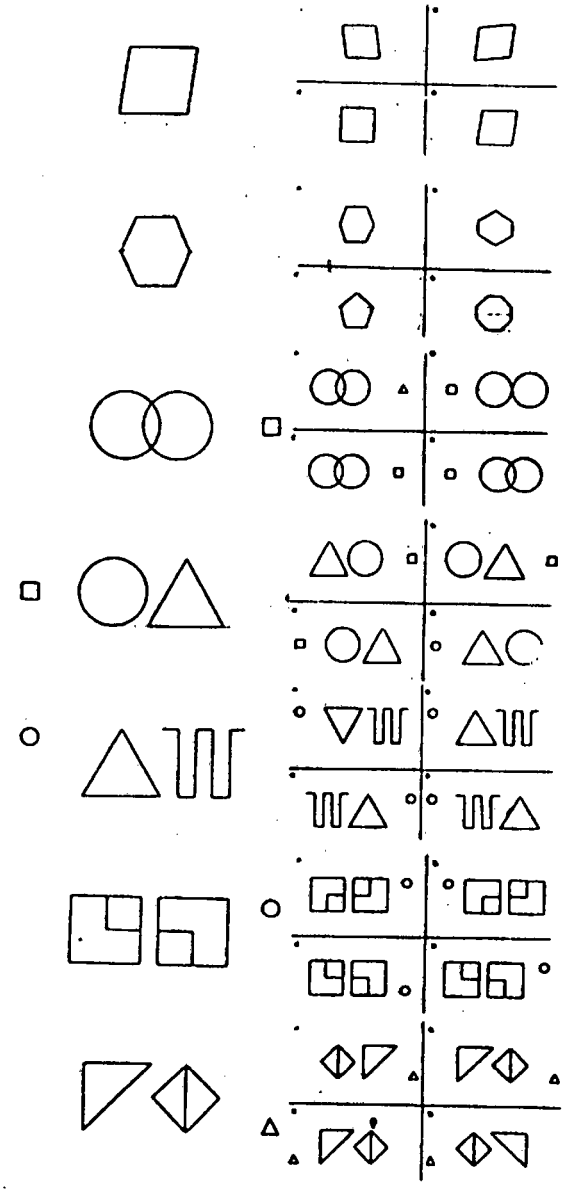
Annexure Eii

APPENDIX I

Annexure F

BENTON MULTIPLE CHOICE VISUAL RETENTION TEST.

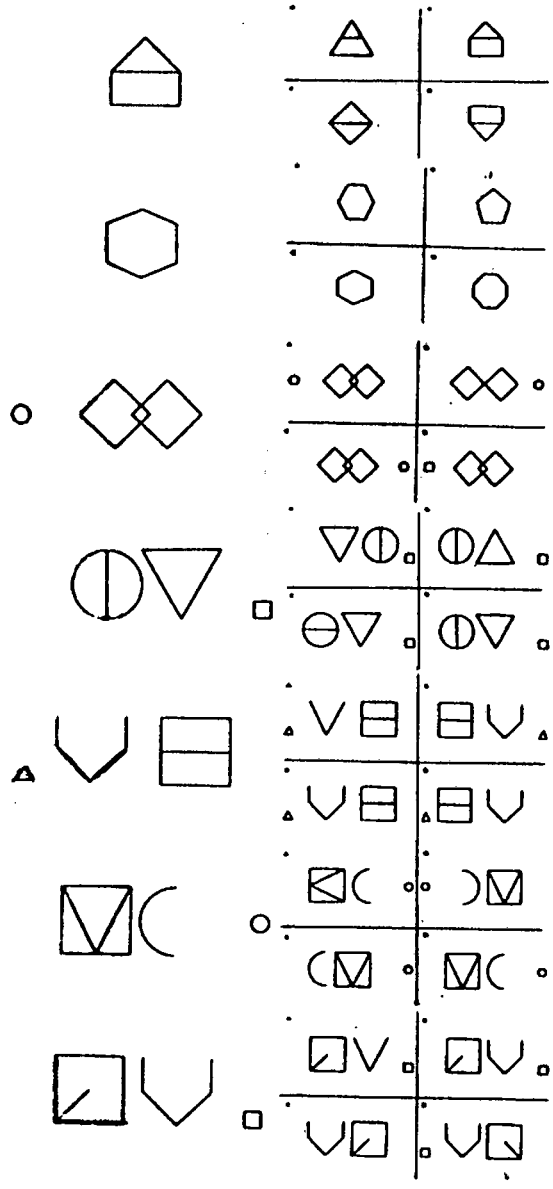
FORM A



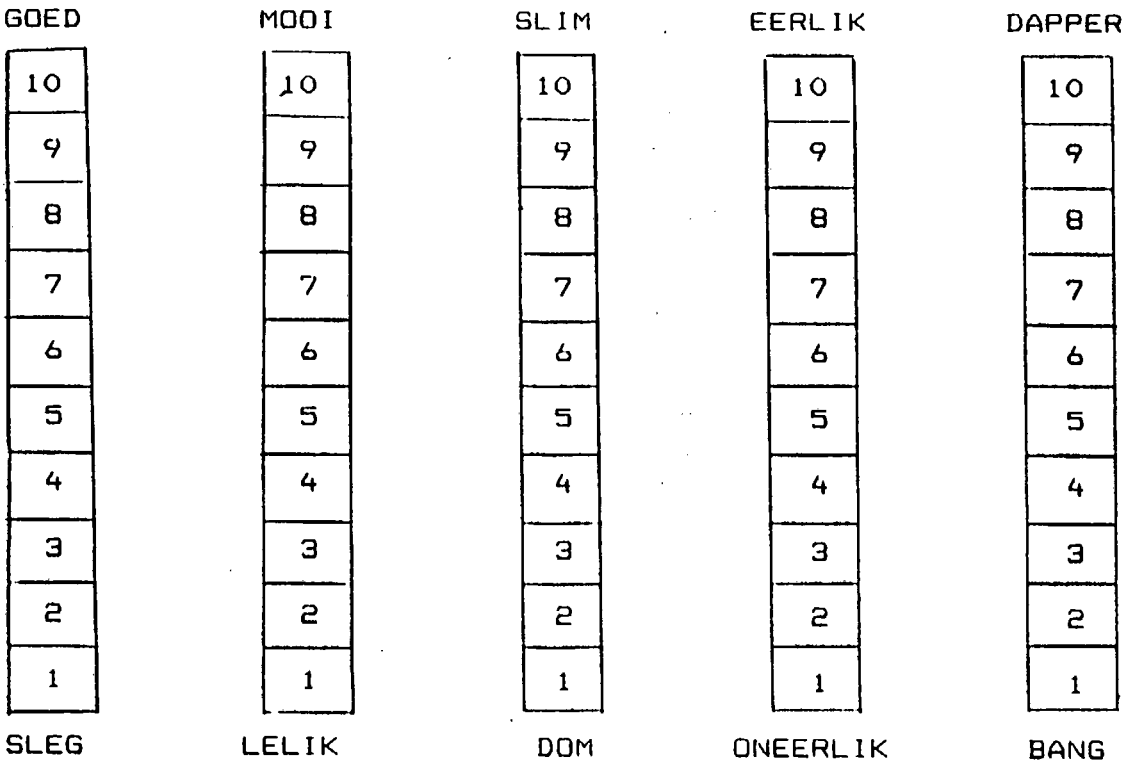
Cards 1 to 7 of the multiple choice type of the Visual Retention Test, with corresponding designs of the drawing type of the test.

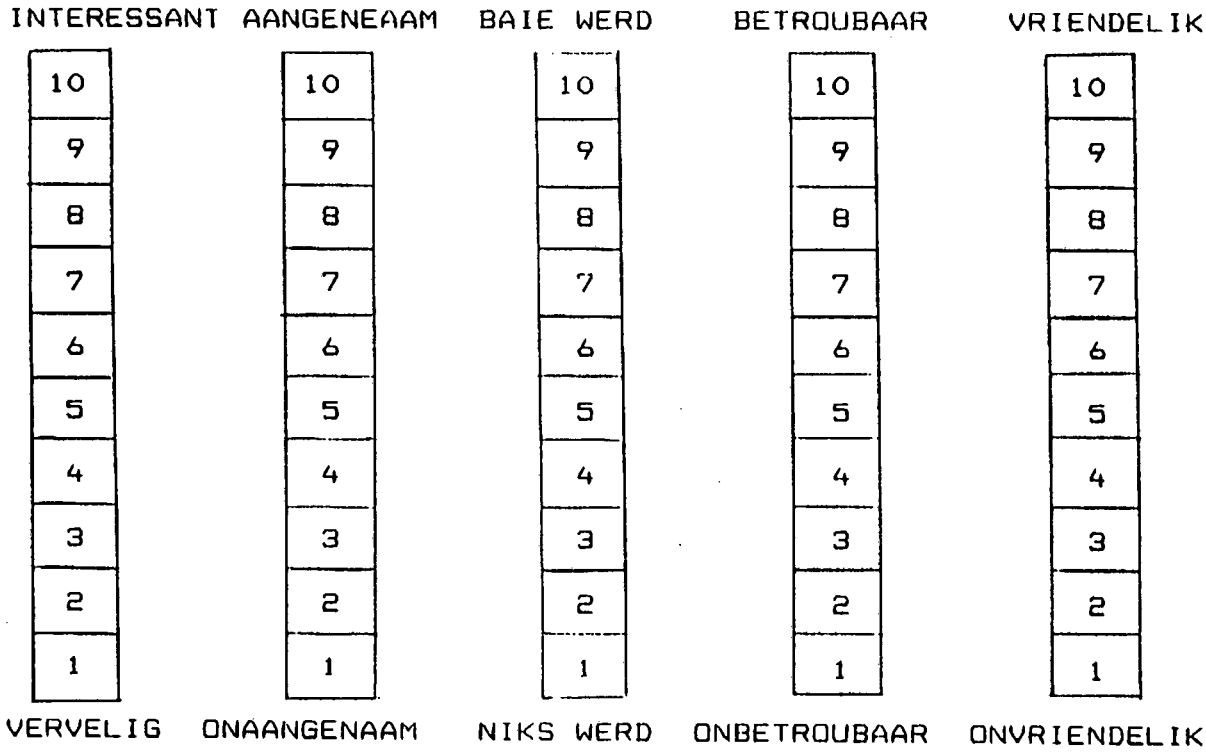
BENTON MULTIPLE CHOICE VISUAL RETENTION TEST.

FORM B



Hieronder is tien leertjies. Elke leertjie stel 'n sekere eienskap voor. Trek nou 'n kruisie op elke leertjie om te wys waar jy staan ten opsigte van die eienskap wat elke leertjie meet. Hoe hoer jy die kruisie trek, hoe beter voel jy oor jouself ten opsigte van die eienskap wat die bepaalde leertjie voorstel.

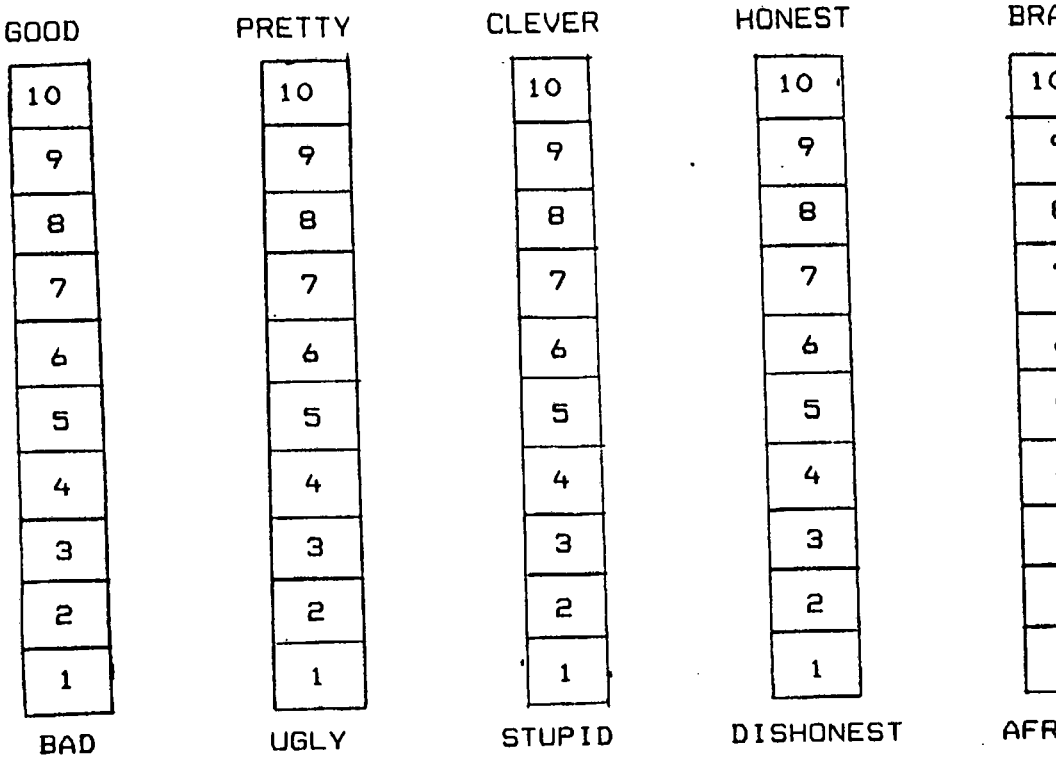


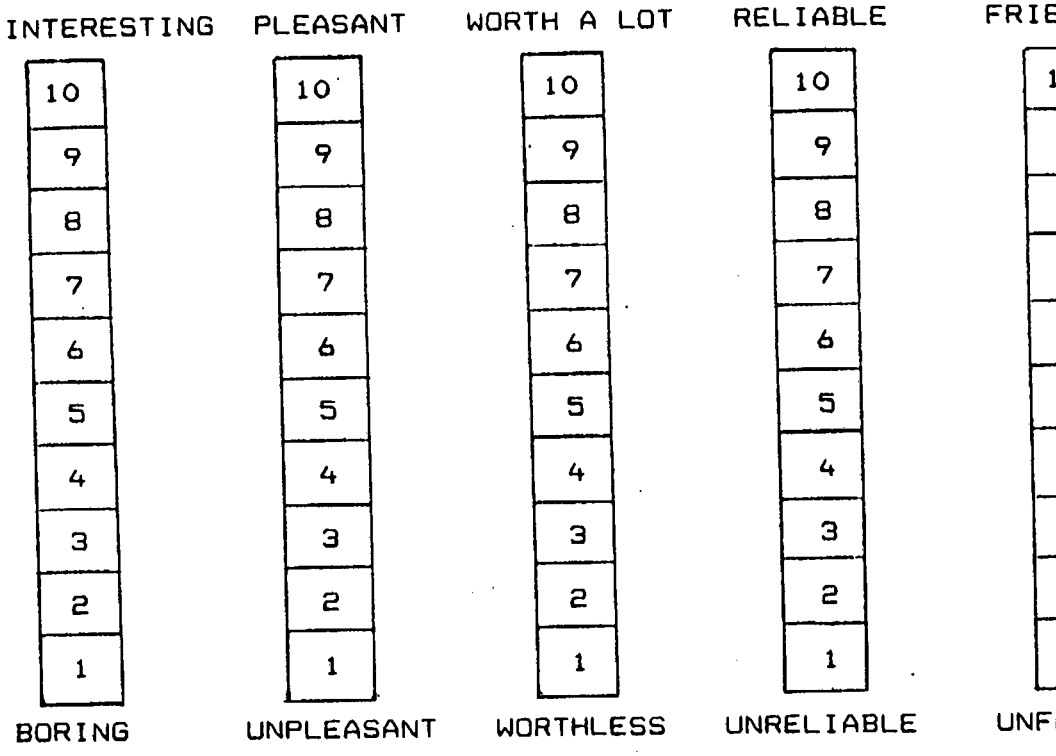


Naam: ..... APPENDIX I

Datum:..... Annexure Gi

There are 10 ladders below. Each ladder suggests a cer
quality. Draw a cross on each ladder to show where you
in relation to the quality that the ladder is measuring.
higher you draw the cross, the better you feel about you
relation to the quality that the specific ladder suggest





Name: ..... APPENDIX

Date: ..... Annexure

SINNE OM TE VOLTOOI

NAAM: _____

DATUM: _____

1. Die gelukkigste tyd _____

2. Die meeste mense wil _____

3. Tuis _____

4. Ek kan nie _____

5. Mens _____

6. In ons gesin _____

7. My grootste vrees is _____

8. Ek voel skaam as _____

9. Ander mens _____

10. Wanneer ek 'n kleintjie was _____

11. Ek is beste wanneer _____

12. Die mees gevaarlikste _____

APPENDIX I

Annexure Hi

13. Die toekoms _____

14. Ek het nodig _____

15. Huwelikslewe _____

16. Somtyds _____

17. Wat kwel my _____

18. Ek haat _____

19. Ek is baie _____

20. Die enigste moeite _____

21. n Mens kan dit nie hulp nie om te wens _____

22. My vader _____

23. Ek _____

24. Op skool _____

25. Wat my meeste bekommer is _____

INCOMPLETE SENTENCE TEST

NAME: _____

DATE: _____

1. The happiest,time _____

2. Most people want _____

3. At home _____

4. I can't _____

5. People _____

6. In our family _____

7. My greatest fear is _____

8. I feel ashamed when _____

9. Other people _____

10. When I was a child _____

11. I am best when _____

12. The most dangerous _____

APPENDIX I

Annexure Hii

13. The future _____

14. I need _____

15. Marriage _____

16. Sometimes _____

17. What pains me _____

18. I hate _____

19. I am very _____

20. The only trouble _____

21. One can't help wishing _____

22. My father _____

23. I _____

24. At school _____

25. My greatest worry is _____

A. INDIVIDUAL'S DETAILS

NAME: _____

DATE OF BIRTH: _____

SEX: M / F

INFORMATION COLLECTED BY: _____

DATE: _____

A.1 EDUCATION:

PRE-SCHOOL TRAINING: Yes / No

DETAILS (e.g. length of time; name of school etc.):

CURRENT SCHOOL & STD.:

DETAILS OF CHANGES IN SCHOOLS:

Number of schools attended (since Sub A):
Reasons for leaving schools (if known):

BEST SUBJECT (Child's choice): Maths or Science / Language / Content subjects / Practical / Other (specify)

POOREST SUBJECT (Child's choice): Maths or Science / Language / Content subjects / Practical / Other (specify)

EXTRA LESSONS / REMEDIAL TEACHING: No / Yes

EXTRA MURAL ACTIVITIES: No / Yes

DETAILS: Art / Music
Hobbies / Interests
Organizations (e.g. Boy Scouts)
Sport

SCHOOL ATTENDANCE - SINCE STARTING SCHOOL: Regular / Irregular

Reasons for irregularity:

SCHOOL PROGRESS: Average / Struggling / Special class / Failing (number of times)

DETAILS:

STUDY HABITS: Disciplined / Exceptionally hardworking / Irregular / Not applicable

RELATIONSHIP WITH TEACHERS: Good / Fair / Bad / Not applicable

A.2 BEHAVIOUR:

PROBLEMS RELATED TO:

Sleeping
Eating
Bedwetting
Very active
Underactive
Attention seeking
Irritable / impatient
Aggressive
Impulsive
Talkative (too much, to anybody)
Asks embarrassing questions ? (e.g. makes personal remarks)
Carelessness (with dress / hygiene)
Anxiety: specific fears
worried, fearful
Moody
Discipline problems (in the cottage)
Discipline problems (in the school)
Other (specify, e.g. sexual, obsessions. etc.)

FRIENDS: Many / A few / Mostly younger / Solitary

A. INDIVIDUAL'S DETAILS

NAME: _____

DATE OF BIRTH: _____

SEX: M / F

HOME LANGUAGE: E / A

FAMILY RELIGION: _____

DATE OF COMMITTAL TO ANNIE STARCK: _____

REASONS FOR COMMITTAL:

****

1. HISTORY

INFORMATION OBTAINED FROM: _____

DATE: _____

1.1 DEVELOPMENTAL:

MILESTONES:

MOTOR DEVELOPMENT: Normal / Advanced / Slow / Retarded / Unknown

LANGUAGE DEVELOPMENT: Normal / Advanced / Slow / Retarded / Unknown

TOILET TRAINING: Normal / Advanced / Slow / Retarded / Unknown

DETAILS: (e.g. comparative ages if not normal in certain areas)

1.2 HEALTH:

AS BABY UNDER 2 YEARS: Normal / very quiet / crying or irritable / unknown

SERIOUS ILLNESSES: No / Yes / Unknown

DETAILS:

SERIOUS ACCIDENTS: No / Yes / Unknown

DETAILS:

PROBLEMS WITH: Eyesight ? No / Yes / Unknown
Hearing ? No / Yes / Unknown
Balance / co-ordination ? No / Yes / Unknown

DETAILS:

CONVULSIONS: No / Yes / Unknown
If yes indicate febrile or epileptic convulsions

OTHER CHRONIC ILLNESSES: No / Yes / Unknown

DETAILS:

OPERATIONS: No / Yes / Unknown

DETAILS:

MEDICATION: No / Yes / Unknown

DETAILS:

****

B. FAMILY COMPOSITION AND DETAILS

1. FATHER (-figure)

RELATIONSHIP TO CHILD: (At time of removal) No father figure / Biological / Adopted / Step / Foster / Other (specify - e.g. grandfather, uncle, mother's boyfriend, etc.)

IF NOT BIOLOGICAL FATHER - DETAILS ON HIM: No details / Deceased / Separated from child; occasional contact / Separated from child; no contact

PRESENT AGE: _____

STATE OF MARRIAGE: (At present time) Married / Widowed / Divorced / Separated / Cohabiting / Indefinite relationship (e.g. father has girlfriend)

LENGTH OF MARRIAGE (If applicable): _____

OCCUPATION: _____

EDUCATION: Unknown / Degree / Diploma / < Std. 10 / < Std. 8 / < Std. 6 / < Std. 3 / None / Other (specify)

JOB STABILITY: Not applicable / Stable / Settling / Unstable

INCOME SOURCE: Not applicable / Salary / Wage / Pension or grant / Works on commission / Other (specify)

2. MOTHER (-figure)

RELATIONSHIP TO CHILD: (At time of removal) No mother figure / Biological / Adopted / Step / Foster / Other (specify - e.g. grandmother, aunt, father's girlfriend, etc.)

IF NOT BIOLOGICAL MOTHER - DETAILS OF HER: No details / Deceased / Separated from child; occasional contact / Separated from child; no contact

PRESENT AGE: _____

STATE OF MARRIAGE: (At present) Married / Widowed / Divorced / Separated / Cohabiting / Indefinite relationship (e.g. mother has boyfriend)

LENGTH OF MARRIAGE (If applicable): _____

EDUCATION: Unknown / Degree / Diploma / < Std. 10 / < Std. 8 / < Std. 6 / < Std. 3 / None / Other (specify)

OCCUPATION: _____

JOB STABILITY: Not applicable / Stable / Settling / Unstable

INCOME SOURCE: Not applicable / Salary / Wage / Pension or grant / Works on commission / Other (specify)

TOTAL FAMILY INCOME (per month) - AT TIME OF REMOVAL

< R100 R101 - R200 R201 - R300 > R300

NUMBER OF CHILDREN DEPENDENT ON ABOVE INCOME:

TOTAL NUMBER OF CHILDREN LIVING WITH PARENTS:

BIRTH RANK OF CHILD:

****

C. SOCIAL CIRCUMSTANCES

1. HOUSING

TYPE OF HOUSING: House / Flat / Squatting / No house / Other (specify)

NUMBER OF ROOMS: 1 Room 2-4 Rooms >4 Rooms

QUALITY OF HOUSING: (Overcrowded = person to room ratio of > 3:1; bed ratio of > 2:1)

Good (no overcrowding)
Fair / adequate (either overcrowded, lack of facilities
Poor / inadequate (both overcrowded with lack of facilities)

HAS FAMILY CHANGED RESIDENCE MORE THAN 3 TIMES (Before committal) ?: No / Yes

SUBURB / AREA OF RESIDENCE (At time of committal):

2. DETAILS OF FAMILY RELATIONS

STATE QUALITY OF MARITAL AND OTHER INTERPERSONAL RELATIONS:

OTHER SIGNIFICANT INSTABILITY: (e.g. abandoned at birth; non support; dessertion; chronic unemployment; selling family assets to support substance abuse; exaggerated immorality; general inadequacy; chronic serious friction among family members)

3. FAMILY DETAILS

MEMBER OF FAMILY WITH PHYSICAL ILLNESS: No / Yes

DETAILS:

MEMBER OF FAMILY WITH PSYCHIATRIC PROBLEM:

("Does anybody have problem with their 'nerves'?")

MEMBER OF FAMILY WITH SCHOLASTIC PROBLEMS:

("Has anybody had problems with school work in the past; or are any brothers/sisters having problems now?" - specify relationship)

SOCIAL PROBLEMS IN THE FAMILY: (Alcoholism / Drug abuse / Crime / Anti-social behaviour - such as aggressiveness, violence, truancy, fighting, fire-setting, etc.)

DETAILS:

CHILD ABUSE / NEGLECT: No / Yes

DETAILS:

[redacted]

VERWYS U ANTWOORD NA
IN REPLYING PLEASE QUOTE

Research 86/7

Beskermvrou/Patron
Mev/Mrs D.M. Viljoen

POSBUS P.O. BOX 8539 JOHANNESBURG 2000 TELEFOON TELEPHONE 339-5741 TEL. ADRES TEL. ADDRESS CHILDHOOD JHB

SUID-AFRIKAANSE NASIONALE RAAD VIR KINDER- EN GESINSORG
2DE VERDIEPING, FARMASIE-HUIS, JUTASTRAAT 26-28, BRAAMFONTEIN 2001

SOUTH AFRICAN NATIONAL COUNCIL FOR CHILD AND FAMILY WELFARE
2ND FLOOR, PHARMACY HOUSE, 26-28 JUTA STREET, BRAAMFONTEIN 2001

1986-11-25

Mrs Judy Blakey
18 Camp Road
PINELANDS
7405

Dear Mrs Blakey

APPLICATION TO UNDERTAKE RESEARCH - "RESEARCH ON COGNITIVE DEVELOPMENT OF CHILDREN"

It gives me great pleasure to inform you that permission has been granted by the Research Committee of this Council for the above investigation.

Cape Town Child Welfare Society will be informed of the outcome and will be requested to assist you.

Once your studies are completed a copy of your thesis would be appreciated. In this way, the results of your studies could be utilized to the benefit of many children.

Yours sincerely

(MRS) E M DOWLING
DIRECTOR

MH/cv

APPENDIX III

Annexure A

ESKA DOWLING

22 DEC 1988