

AN INVESTIGATION OF FEUERSTEIN'S THEORY OF MEDIATED
LEARNING EXPERIENCE WITH A DISADVANTAGED COMMUNITY.

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ABSTRACT

The aim of the present study was to investigate Feuerstein's theory of mediated learning experience as the underlying component of structural cognitive modifiability.

One hundred subjects were randomly drawn from a population of 300 disadvantaged South African pupils. The subjects were assigned also at random to experimental and control conditions; the experimental group receiving the Learning Potential Assessment Device (LPAD) with mediation and the control group receiving LPAD without mediation. All the subjects were then tested on measures cognitively comparable to the LPAD tasks but containing different content, thus forming transfer measures.

Fifteen high achievers and fifteen low achievers, selected on the basis of academic record, were drawn from the experimental group. They were selected to provide a disparate sample that should show differences in past experience of mediated learning. They were interviewed with questions that attempted to access the presence of mediated learning experience in the home background. Based on the interview questions two groups

were established as having had a high or low amount of mediated learning experience in early child-adult interactions.

The high and low MLE groups were then compared on different variables: academic performance, LPAD scores, and posttest transfer scores. It was hypothesised that the high MLE group would achieve significantly higher scores on these variables than the low MLE group. The high MLE group did significantly better than the low MLE group on academic performance and on the posttest transfer scores. However the high MLE group and the low MLE group were not significantly different on the LPAD scores.

It was tentatively suggested that the questionnaire was able to identify the presence and absence of MLE in early child-adult interactions. It was also suggested that the subjects identified as the high MLE group were more able than the low MLE group to perform at a higher cognitive level, to benefit from mediation, and to generalise those cognitive skills to other tasks.

It was concluded that support was given to Feuerstein's theory that mediated learning experience is the proximal factor in cognitive development.

DECLARATION

I declare that this research project is my own, unaided work. It is being submitted in partial fulfillment of the requirements for the degree of Master of Arts (Clinical Psychology) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

L. H. Cey

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CHAPTER I

INTRODUCTION

There has been increasing dissatisfaction with psychometric testing in general and intelligence testing in particular. Despite many criticisms, however, there has been little change within the sphere of traditional testing over the last fifty years. Richards et al (1972) comment that most of the effort has gone into refining the IQ and that there has been little effort invested in understanding cognitive functioning. Frederiksen (1986) points out that the only real changes have been to develop more multiple choice tests, so that many important abilities are left untested and, more importantly, left untaught. So although the issues around IQ have been well documented and criticisms raised there has in effect been little change, which warrants yet another look at the current status of intelligence testing; "although a considerable amount of data has been gathered and processed in the intervening period, the major sources of controversy are virtually unchanged" (Evans & Waites, 1981:180).

It is important to emphasise that IQ is not an isolated, unimportant entity, but is a reified construct that has

major and often devastating effects on individuals' lives. In short it has become a powerful, political and educational tool of oppression. The fact that it is inextricably tied up with education has important implications in South Africa where there is already a dominant oppressive ideology, that discriminates against the majority of the people in the society on the basis of race and culture. A tool such as the IQ that supports this racial discrimination can and does play a vital role in educational policies.

Given the history of unequal educational opportunities in South Africa it would seem even more important to find a means of cognitive assessment, that would alter current attitudes about the nature of intelligence and result in appropriate remediation of current deficits and disadvantages. Interest in more recent years has been on the work of Reuven Feuerstein, an Israeli psychologist, who has tried to tackle this very issue. He offers, not an adaptation of traditional testing techniques, but an assessment procedure based on a new theoretical understanding of cognitive development.

Black pupils can be seen as particularly disadvantaged with a chequered and violent educational past. The history of black education has been one of discrimination, characterized by low funding, poor

teaching and poor facilities. 1989 looks set to be no different. Admission curbs imposed by the government in black schools and poor 1988 matriculation results seem likely to worsen the chaos which permeates black education.

Pupils from Alexandra and Soweto, members of this disadvantaged community, were selected for this study because it would seem that changes in educational attitudes and educational systems are important for them.

Historically attempts to change the status quo have been resisted. For example Operation Headstart in the USA, which began in 1965, has been described as poorly researched and abandoned due to few observable improvements, (Eysenck, 1971). It is important to question on what basis improvements were judged, as increases in self-esteem, confidence and health were noted as well as improved school performance in the area under the Child Development Group of Mississippi. It seems that as these changes threatened the existing social structures they were abandoned, (Richards et al, 1972; Gould, 1977; Shochet, 1986). Gould comments on why nationally they were not seen as successful : "(1) we did not spend enough money, we did not make sufficiently creative efforts or (and this makes any established

leader jittery) we cannot solve these problems without a fundamental social and economic transformation of society; or (2) the programs failed because their recipients are inherently what they are - blaming "the victims. Now which alternative will be chosen by men in power in an age of retrenchments?" (Gould, 1977:150). These two options could very well be placed before the educational authorities in South Africa today. Gramsci's theory of hegemony further suggests that the authorities will resist movements that will affect the substructure of the state (Buggs, 1976).

In order for notice to be taken of a new method of assessment and remediation, convincing research needs to be presented that investigates all aspects of Feuerstein's approach including his theory of mediated learning experience. The aim of this study is, therefore, to investigate Feuerstein's concept of mediated learning experience. This is a key component of his theory of structural cognitive modifiability which presents a dynamic approach to assessment.

CHAPTER II

A BRIEF REVIEW OF THE LITERATURE

2.1 The IQ Controversy.

2.1.1 A Brief Historical Background to Intelligence Testing.

Intelligence testing has been important in psychology and education for the past 80 years. The first measurement was developed by Alfred Binet in order to identify those children who could and could not benefit from the current Parisian education. He was especially aware of the limitations of the 1905 test preferring to talk in terms of mental level rather than mental age. He said the latter term suggested an ordered progression of cognitive development, which he had found does not occur in 'normal' children.

Despite Binet's conservative stance his tests were soon adopted and modified particularly in Britain and the USA. In Germany in 1911 Wilhelm Stern made the

theoretical jump from Binet's test to the concept of the intelligence quotient, despite the fact that Binet had been clear in stating that the test was in no way accurate enough to produce a numerical result. The intelligence quotient or IQ was quickly adopted and Binet's concept adapted into the Stanford-Binet test in the USA in 1916, where it was used in extensive testing of troops in World War I. Kamin (1977) points out that the results of the army alpha and army beta tests were not really used to aid placement as intended but provided enormous amounts of data that were later used to support theories of genetic inferiority. These theories became fuel for many of the actions taken by the eugenics movement.

Following this initial move to quantify intelligence, research studies quickly arose to add support to what had already been happening in practice. One of the most influential pieces of research is that by Sir Cyril Burt (1926, in Kamin, 1977) whose study of monozygotic twins led to 'convincing' conclusions that intelligence as measured by IQ tests was at least 80% due to genetic factors. The heritability of IQ has more recently been taken up by Jensen (1969) and by Eysenck (1971). Jensen argues that genetically individuals are able to function at one of two levels. Level I he describes as basic associative ability that does not equip the individual

for the more conceptual processes involved in problem-solving, which is the functioning ability ascribed to level II. He furthermore states that individuals with the genetic endowment of level I cannot be taught the skills involved in level II and education must, for these individuals, be geared at a lower level.

Kamin (1977), has critically reviewed the work of Burt (1926) and Jensen (1969), and concludes that on the basis of the data currently available the claims that genetic factors influence intelligence by 80% cannot be made. He comments "there is in fact much that is not known and what is known is no more consistent with a genetic than an environmental interpretation." (Kamin, 1977:225).

Despite the criticisms of what has at times been described as the Jensen Heresy (Eysenck, 1971), the social and political implications of such a viewpoint are still far-reaching. The influence on education has been extensive, resulting in early streaming and selection. This has deprived certain pupils of educational opportunities on the basis that genetically they would not be able to benefit from them. It supports a particular world view that those who do well in society do so because they have the correct genetic make-up and vice versa. Consequently it frees

educationalists and policy-makers from having to address unbalanced social conditions and opportunities (Evans & Waites, 1981).

In reaction to the geneticist position 'environmentalists' have emerged, concerned about the implications of cross-cultural testing, (eg. Anastasi, 1982; Cronbach, 1975). The environmentalists have addressed issues such as the validity and reliability of the current IQ tests, and the effect of standardisation on a group non-representative of the sample of people being tested. They have tried to work toward tests that were more culture-fair. Shochet (1986) comments that although this was a positive move environmentalists did not develop their own model, and that culture-fair tests were used to develop better IQ measurements without the actual concept of IQ being fully challenged.

2.1.2 The Nature of IQ.

The IQ score has become a 'thing', something concrete that can be measured accurately, that does not change over time or circumstance, and has become synonymous with the term 'intelligence'. The reification of the IQ has resulted in educationalists and psychologists losing sight of the construct it in reality is. It is a term

that is used freely although it is as yet a term that is undefined. The tautological thinking of the definition: 'intelligence is what is measured by intelligence tests and therefore IQ becomes the measurement of intelligence' is no longer accepted. Anastasi (1982) describes an IQ score as "an expression of an individual's ability level at a given point in time, in relation to the age norms." (Anastasi, 1982:347) and Ryan (1972) similarly describes an IQ score as "essentially an expression of how far up the scale of difficulty an individual has got with respect to his chronological age." (Ryan, 1972:49).

In defence of the IQ Eysenck (1971) and Vitro (1979), for example, suggest that the criticism should be against the testers rather than the tests themselves. However, convincing arguments have been lobbied that the basic tests are intrinsically discriminatory whatever the orientation of the tester. The selection of the items involved in the IQ test is based on no articulated theory (Ryan, 1972; Feuerstein, 1979; Evans & Waites, 1981). Ryan comments: "the selection of items is not influenced by any theoretical view of how children develop with age, or by any consideration as to the developmental significance of the particular items." (Ryan, 1972:49).

The stability of the IQ score, often used as evidence of an immutable, inherited intelligence, is clearly an artifact of how the tests are constructed. Those items that show change over time are excluded from the test and only those items that remain stable are included (Ryan, 1972; Heather, 1976; Feuerstein, 1979).

Sternberg (1986) however discusses a progressive move in intelligence testing. He suggests that there are indications that testing will be more solidly based on psychological theory, that a broader set of abilities will be assessed, and that there will be an increased focus on the process underlying intelligence and learning potential. He cites Feuerstein's dynamic LPAD as an important part of this new movement in intelligence testing.

2.2 Feuerstein's Theory of Cognitive Modifiability.

2.2.1 Feuerstein's Criticisms of Traditional Intelligence Testing and His Alternative : The Learning Potential Assessment Device.

In addition to the authors discussed so far, Feuerstein has looked at cognitive performance in cross-cultural studies and individual low performance. Underlying his

comprehensive criticism of the traditional testing movement, Feuerstein emphasises that they approach cognitive functioning in a static, passive way rather than understanding what education must be about : change and modifiability. When change is seen in traditional tests it is argued away as an error instead of seen as a genuine component to cognitive functioning. Feuerstein suggests the following definition : "To a very large extent cognitive functioning represents autoplaticity - the ways in which an organism changes itself in response to the disruption of its equilibrium by sudden changes in the internal or external environment" (Feuerstein, 1979:6).

Feuerstein in his 'dynamic' approach emphasises that the purpose for assessment is not to produce a rigid label or number that conclusively defines a person, but to gain information about appropriate intervention to aid an individual's adaptation to her/his world. Feuerstein along with many others is particularly critical of the damaging effects of labelling and classification and comments that: "the question of psychometric measurement has become an issue in civil rights" (Feuerstein, 1979:9). He states that the individual should be served by the assessment and not discriminated against as a result of the assessment and the accompanying label. Against the defence that children need their labels in

order to receive special remedial education, Feuerstein argues that such children are seen as the stereotype of their label. It leads to a self-fulfilling prophecy because teaching is adapted to a low, concrete level as opportunities for learning become limited.

His criticisms lead to a comparison of what he describes as the passive-acceptant approach with his own active-modification approach. In the passive-acceptant approach the individual is 'blamed' for poor performance due to genetic, organic or irreversible environmental factors. The education system does not want to accept inherent inequalities in its own system, and in this way avoids making changes. Feuerstein contends that psychometric measurement creates rather than reflects inequality. In the premise of the active-modification approach the individual is seen as an autoplasic open system, open to change and thus to cognitive modifiability. This places a new responsibility on the educator, psychologist and policy maker, as effective and adequate remedial opportunities have to be provided for all.

Although attempts have been made to improve the status of current psychometric testing, Feuerstein is critical of them, commenting: "all of these instruments reveal inadequate performance patterns in culturally deprived

populations, but none of them can reveal the deprived child's potential for being modified by learning" (Feuerstein, 1979:49). He argues for a complete and thorough change both in the attitude of the tester and the educator, and in the basic structure of the test. Change in testing needs to take place in four basic areas:

- (1) the structure of the tests;
- (2) the examination situation;
- (3) the orientation of the tests;
- (4) the interpretation of results.

(1) The structure of the tests. The aim of education is to teach and to modify and yet in current assessment techniques there is no measurement of the individual's ability to learn. Feuerstein proposes that assessment tests should be so structured that they include components of learning in a test-teach-test format, so that information about the potential functioning of the individual can be obtained. Traditional IQ tests are used as predictors of performance yet they are tests only of current knowledge and give no indication of the individual's ability to learn. Feuerstein makes the important distinction between the manifest level of functioning and the capacity for functioning. Traditional tests, he states, measure the former and yet

actually claim to measure the latter, so that the concepts of what the individual can do at a fixed moment in time and what her/his potential is become confused. It is important that these are made distinct so that predictions are not made on the basis of false evidence.

(2) The examination situation. In order to allow the test-teach-test process to occur the traditionally passive stance of the tester would have to change. Feuerstein describes that the tester becomes a teacher-observer and the testee becomes a learner-performer. This shift allows a two-way communication process to emerge. The examiner constantly interviews, makes remarks, requires and gives explanations, and notes what the individual does and does not grasp. This is in direct contrast to the traditional IQ test where the examiner offers no help, no hints, no explanations and no feedback of any kind.

(3) The orientation of the tests. The tests need to change from a product to a process orientation. Traditional tests place all their emphasis on producing a result, an IQ score, which becomes the focus of interpretation and basis for decisions made on the test. Feuerstein argues that the final product of the test has little or no value, and that the focus of the test should be the actual cognitive processes of the

individual that lead her/him to various solutions. This then paves the way for an informed remediation programme to be devised, as during the assessment itself the tester has learnt about those areas that specifically require intervention.

(4) Interpretation of results. As the orientation of the test no longer focuses on the final, single score of the test so the interpretation of the results does not rest on this score. In traditional tests an average is taken and unusual high performances are seen as a mistake or aberration from the norm. Feuerstein challenges this view and claims that peaks in performance are an indication of the cognitive potential of the testee, and should not be discounted but should form a central component of the interpretation of results.

Using these criticisms and suggested changes Feuerstein has developed a mode of assessment which is dynamic and active-modificational : the Learning Potential Assessment Device (LPAD). This technique attempts to assess the modifiability of the low performer through focused learning. The items chosen are those amenable to clear identification of cognitive functions at the three separate levels of input, elaboration and output. Although it is often easy to pass the training sheet, the tester encourages pupils to discuss problem-solving

strategies that can later be applied to the test problems of increasing difficulty.

The aims of the LPAD are the following :

- (1) to determine the extent of modifiability and generalisation from task to task;
- (2) to determine the amount of investment needed;
- (3) to determine the nature of investment required; and
- (4) to determine the presence of preferred communicational and learning modalities. This, Feuerstein states, makes the assessment process a focused and therefore useful tool, so that intervention strategies can be informatively planned and developed to meet the needs of the individual child. Based on the findings of the LPAD an Instrumental Enrichment programme is devised, which will be discussed in a later section.

2.2.2 Feuerstein's Theoretical Basis.

Feuerstein makes yet another criticism of traditional testing in that it lacks a theoretical foundation. Eysenck (1981) does not see this as a problem, and comments that the reader may find it surprising that "useful measurement can be undertaken in the absence of a solid theoretical basis" (Eysenck, 1981:8). In

hindsight, looking at the harm that such 'successful application' has had on many individuals and groups, the author feels that theoretical stability is one of the major strengths of Feuerstein's work. Jean Piaget and Lev Vygotsky have had considerable influence on Feuerstein's development of a theoretical grounding.

Piaget's major influence on Feuerstein occurs more in his attitude to the methods of assessment rather than in his interpretations of intelligence. Piaget's methodology is one of individual observation and active testing. His approach is flexible and thorough, characteristics which can be found in the LPAD. However Feuerstein does not agree with Piaget's view that learning is dependent on spontaneous development and, therefore, that intelligence is a particular form of biological adaptation. Nevertheless, he does comment: "Piaget's work . . . has been primarily useful in pointing out that the level of cognitive functioning over a range of culturally different children may be equally developed in spite of sharp variations in performance as revealed on traditional psychometric measures" (Feuerstein, 1979:55).

Vygotsky's perspective of the growing child developing within a certain historical context had an important influence on Feuerstein's understanding of cognitive

development. Unlike Piaget's view of internal spontaneous development, Vygotsky saw development primarily taking place in the external, cultural context and then becoming internalised. This implies that different cultural communities have different tools due to different societal requirements, but are not inferior as judged on traditional western tests of assessment.

From Vygotsky's theory of transmission of culture Feuerstein developed the important distinction between cultural difference and cultural deprivation. Cultural difference occurs when different tools are used within different societies but that the transmission process occurs in all. Cultural deprivation occurs, and can do so in any culture, when the tools of a certain culture are not adequately transmitted to an individual or a group of individuals, thereby denying basic skills with which to adapt to their and other environments. Underlying this is the assumption that no society is culturally superior or inferior to another, and given transmission of culture the cognitive skills can be translated and developed to adapt to a new societal structure.

Vygotsky has also influenced Feuerstein's conceptions of the process of assessment. The key concept in Vygotsky's theory of cognitive development is that of the zone of

proximal development: "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978:86). He further proposes that the interactive process in assessment, as seen in the LPAD, is important and that "what children can do with the assistance of others might be in some sense even more indicative of their mental development than what they can do alone" (Vygotsky, 1978:85). In effect the 'teach' component of the LPAD works in the zone of proximal development.

2.2.3 Mediated Learning Experience - Feuerstein's Theory of Cognitive Development.

Feuerstein sees the individual as an autoplasic being with the ability to be changed and be modified. Cognitive functioning is no different and Feuerstein outlines that the cognitive structures developed in an individual are open to modification, even in adolescence, and are not fixed and immutable. This means that development and remediation does not merely result in changes of specific behaviours and skills, but in structural changes. Mediated learning experience (MLE) is the underlying theoretical basis for cognitive

modifiability. As described previously cultural deprivation does not imply that belonging to a specific culture is necessarily depriving. It is not the culture that is depriving but the individual that is deprived of the culture: "cultural deprivation is the result of a failure of the part of a group to transmit or mediate its culture to the new generation" (Feuerstein, 1988:13).

Feuerstein postulates that there are two modalities by which cognitive structures develop in interaction with the environment. The first is direct exposure to stimuli which affect the individual from the first day to the last. The second is mediated learning experience where the culture is intentionally and directly transmitted to the child. Feuerstein defines MLE in the following way: "the interactional processes between the developing human organism and an experienced intentioned adult, who, by interposing himself between the child and external source of stimulation, 'mediates' the world to the child by framing, selection, focusing and feeding back environmental experiences in such a way as to produce in him appropriate learning sets and habits" (Feuerstein, 1979:71). In effect the mediator organises the world for the child and through this process the cognitive structures of the child are affected, which then increases her/his capacity to be modified by direct

exposure to stimuli. MLE therefore becomes a crucial component in cognitive development.

On the basis of his theory of MLE Feuerstein investigates the aetiology of cultural deprivation and draws a distinction between distal and proximal determinants that affect cognitive development. The primary or proximal determinant he describes as MLE and lack of MLE leads to cultural deprivation. Determinants such as environmental stimulation, socioeconomic status, genetic and organic factors he describes as distal. These factors may affect the proximal determinant of MLE but do not necessarily lead to inadequate cognitive development.

The important underpinning to MLE is the belief in the reversibility of cognitive dysfunctions under certain conditions. This has led to the development of the Feuerstein Instrumental Enrichment (FIE) programme which, based on information gained in the LPAD assessment, is an attempt to remediate cognitive dysfunctions using the principles of MLE. It is this feature of modifiability that separates Feuerstein's theory from more traditional theories of cognitive development and assessment. Although he does not discount environmental factors such as poverty, pathological conditions of the parents, or endogenous

conditions of the child, he emphasises that these conditions may, but not necessarily, affect the quantity and/or quality of MLE. These environmental conditions are important but Feuerstein (1981(b)) regards it as simplistic to believe that change in these conditions will automatically result in change in cognitive functioning. He cites examples of individuals from extremely deprived communities who function at very high levels, and uses the presence of MLE to account for this apparent discrepancy.

Feuerstein (1980) outlines various characteristics of mediated learning experience:

- (1) Intentionality and reciprocity - the adult/mediator engages the child with an intention to teach, with the child having a reciprocal desire to learn. It involves the important concepts of rapport and mutual understanding.
- (2) Transcendence - the mediator applies the learning that is taking place beyond the particular situation.
- (3) Mediation of meaning - the transmission to the child of understanding the value, significance and relevance of what s/he is doing.
- (4) Mediation of a feeling of competence - creation in the child of a feeling of mastery and success.

(5) Mediation of regulation and control of behaviour - mediating the processes of reflection and personal control to guard against impulsiveness, for example.

(6) Mediation of sharing behaviour - to enable individuals to be able to learn from each other.

(7) Mediation of individuation and psychological differentiation - emphasising the value of difference for example that there are different approaches to the same thing, a 'celebration of diversity'.

(8) Mediation of goal-seeking, goal-setting, and goal-achieving, and planning behaviour - emphasises the importance of setting goals and developing ways to achieve them.

(9) Mediation of challenge - mediates the search for novelty and complexity, and emphasises that it is positive to take risks, and that one does not always have to be right.

(10) Mediation of self-change - the individual becomes her/his own mediator.

The first three criteria - intentionality and reciprocity, transcendence, and mediation of meaning - are essential and necessary for an interaction to be seen as a mediated learning experience. Feuerstein comments however that for such an interaction to take place, there does not have to be an awareness of these characteristics on the part of either the mediator or

the person to be mediated. An important feature of all these criteria is that MLE is not dependent on content. Although content is important in exposing the individual to various different contexts, it does not directly affect the development of cognitive structures. Consequently, the process of remediation (FIE) is not content dependent.

Feuerstein further expands on the theory of MLE by dividing it into two categories: cultural transmission and mediated learning. Cultural transmission involves the transmission of knowledge from one generation to the next that would otherwise be unavailable, and includes events and information not within the individual's ability for direct experience. The individual who is cut off from her/his heritage and cultural background becomes isolated and therefore culturally deprived. "Mediated transmission of the past and future is enriching for the individual not only with respect to content but, more important, through its production of new needs and ways of relating to the world, which transcend those experiences directly available to the senses" (Feuerstein, 1980:25).

One of the distal factors that may affect cultural transmission is the difficulty that arises with the combination of various different cultures as Feuerstein

discovered in Israel and is certainly the case in South Africa. He suggests that ideologies of oppression may result in people being forced to cut themselves off from their past, or needing to identify with the dominant culture at the expense of their own.

The category of mediated learning involves various components such as: the caregiver selecting stimuli to which s/he exposes the child, teaching the ability to focus and select; scheduling the stimuli which presents temporal and spatial dimensions; teaching the components of anticipation of consequences and comparative behaviour; and the important features of imitation, repetition and variation which aid in the development of cognitive structures. Feuerstein comments that the earlier these processes begin "the greater the individual's efficiency in becoming modified through direct exposure to stimuli and, consequently, the greater his capacity for further learning and development" (Feuerstein, 1980:35).

Feuerstein (1980) cites as supporting evidence for the theory of MLE, the observation of cognitive modifiability during LPAD assessments and FIE programmes. He refers to the work of the Youth Aliyah which is responsible for the integration of immigrating Jewish children into Israel. However, he has not

directly investigated his theory of mediated learning experience. Bradley (1982) states that we need to be cautiously optimistic when dealing with Feuerstein's work. He refers to previous enthusiastic adoptions of remedial models. For example the Illinois Test of Psycholinguistic Abilities (ITPA) that, due to enthusiasm, educators were uncritical, which resulted in impaired education for the children involved. Sternberg (1986, 1984) and Silverman (1985) suggest that the LPAD is an important advance in educational assessment, and also emphasise the need for continued research. Sternberg (1986) is in fact developing his own alternative psychometric measure.

Much of the recent and current research in this field focuses on the Learning Potential Assessment Device and the Feuerstein Instrumental Enrichment programme, and encouraging results are reported (eg. Feuerstein, 1979; Rand et al, 1979; Feuerstein, 1981(b); Schakel, 1984; Shochet, 1986; Keane & Kretschmer, 1987; Skuy & Shmukler, 1987; Skuy, Kaniel & Tzuriel, 1988). The author has been unable to find any research that investigates MLE as it occurs in primary child-adult interactions, which forms the basis of cognitive development. The focus has been on the important role of MLE in cognitive assessment using the LPAD and in cognitive remediation using FIE. Given that one of

Feuerstein's important contributions is the theoretical basis for his work it would seem crucial to try and investigate the theory. The work of this research is to attempt a primary study to investigate this aspect of mediated learning experience.

2.3 The Concept of 'Gifted' in a Disadvantaged Community.

Feuerstein's LPAD and theory of MLE do not have implications only for retarded performers but also are important for the other end of the spectrum. The concept of giftedness becomes a difficult and complex issue in a disadvantaged community. Generally there is a lack of agreement on what constitutes giftedness, and criticisms are levelled at the traditional criteria for assessing it; i.e. high IQ score (130-140+) and teacher nominations (Collingelo, 1984; Getzels & Jackson, 1965). Frazier (1979) emphasises that it is important to reconceptualise attitudes to the disadvantaged student, and that prior to the 1960s educators and psychologists were only interested in academic and social difficulties and not in potential.

The difficulty of identifying the gifted individual from the disadvantaged community is evident, in view of

criticism of traditional techniques which, as in general assessment, are seen as discriminatory. Johnson, Starnes, Gregory & Blaylock (1985) have developed the Program of Assessment, Diagnosis and Instruction (PADI) and others are using adaptations of Feuerstein's LPAD (Wallace & Adams, 1987; Harth, 1982).

Skuy et al (1986) have investigated the use of the LPAD with academically superior children in a low socioeconomic community in Israel. They emphasise the dilemma of identifying disadvantaged pupils as gifted and therefore to be included in mainstream gifted programmes. They conclude that the LPAD could be a valuable tool in such a task.

The subject sample for this study is taken from the Soweto Gifted Child Programme. The selection criteria for admission are rather vague but seem to involve relative academic adequacy or good performance in at least one subject. However this results in a wide discrepancy of levels of academic achievement. The possibility of using LPAD techniques to identify gifted children, not only for this programme but for others, is being considered (Skuy & Shmukler, current research).

CHAPTER III

THE STUDY

3.1 Rationale.

Increasing dissatisfaction towards traditional testing techniques has resulted in the development of alternative methods of assessment, for example work by Sternberg (1986) based on his componential theory of intelligence, and Feuerstein's LPAD. Mediated learning experience, which underlies Feuerstein's theory of structural cognitive modifiability, has been investigated in a current context in terms of its role in the LPAD and in cognitive remediation. As already mentioned there has been as yet no systematic research into the role of mediation in early child-adult interactions and its resulting effect on cognitive development and performance. The author considers this essential for a comprehensive investigation of Feuerstein's work.

In addition, the need for research with disadvantaged communities in South Africa has been emphasised, so that

consequently, black pupils have been selected as the population for this study. The pupils, living in the designated black areas of Soweto and Alexandra, are taken from the Soweto Gifted Child Programme. According to the theory of cognitive development these subjects are likely to have had mediating learning experiences resulting in their elevated academic performance. In addition these subjects should be better able to use further mediation given to them. Although the subjects are all considered to be gifted, the wide discrepancy in academic achievement enables a high achieving group and a low achieving group to be selected. The purpose of this study is to investigate the level of MLE in the backgrounds of the subjects of these two groups.

3.2 Aims and Hypotheses.

The aims of the present study were the following:

- To identify a high achieving group and a low achieving group using a questionnaire aimed to reflect the degree of MLE in the home.

- To determine whether or not there are differences between the high and low school achievers in the extent of MLE as accessed by questions relating to home background.

- To determine whether or not there are differences in home background between high and low academic performers on the LPAD items.

The following hypotheses were postulated :

Hypothesis I : The group identified as having had high MLE will have a higher level of academic achievement than the low MLE group.

Hypothesis 0 : There will be no difference in the level of academic achievement between the two groups identified as having had high and low MLE.

Hypothesis II : The group identified as having had high MLE will have a higher level of achievement on LPAD tasks than the low MLE group.

Hypothesis 0 : There will be no difference in the level of achievement on LPAD tasks between the two groups identified as having had high and low MLE.

Hypothesis III : The group identified as having had high MLE will have a higher level of achievement on transfer measures comparable to the LPAD tasks than the low MLE group.

Hypothesis 0 : There will be no difference in the level of achievement on transfer measures comparable to LPAD tasks between the two groups identified as having had high and low MLE.

CHAPTER IV

METHOD

The research was divided into two parts. The first part investigated the use of the LPAD in assessment in a disadvantaged community (Hoffenberg, 1988). From this investigation subjects were selected and various measures established which were then used in the second part of the research. The second part, forming the basis of the present study, focused on a more detailed investigation of mediator experience in this disadvantaged community.

4.1 PART I

4.1.1 Subjects.

One hundred subjects were randomly selected from three hundred pupils attending the Soweto Gifted Child Programme. The pupils were selected for the Programme on rather vague conditions, which included relative general

academic achievement or achievement in at least one school subject. The pupils were selected from the black township areas of Soweto and Alexandra. The one hundred subjects were randomly divided into four groups. The sample consisted of 54 girls and 46 boys. The ages ranged from 12 to 19 years with a mean age of 14 years 8 months.

4.1.2 Test Materials.

Three LPAD measures were used, the Organiser (A), Verbal Analogies Test, and Set Variations I and II. The Organiser (A) is a measure of hypothetical thinking and assesses the ability to use strategies to test hypotheses. It involves the organisation of items in terms of the relationships between them and is a verbal test with a numerical component.

The Verbal Analogies Test (VAT) is a measure of analogical thinking. Again it is a verbal test and assesses the ability of the student to understand and develop relationships between items.

Set Variations I and II is, in contrast, a non-verbal test. It is based on Raven's Standard Progressive Matrices and is a test of non-verbal analogical

thinking.

Independent measures were established on the Organiser (B), Similarities subtests of the WISC-R and the WAIS-R, and Raven's Standard Progressive Matrices. These independent measures tap comparable cognitive processes to the LPAD.

As there was no suitable transfer measure for the Organiser (A) an alternative form of the same test, containing different content, was used. The Organiser (B) is also a measure of hypothetical thinking.

The Similarities subtests, taken from both the WISC-R and the WAIS-R to cover the disparate ages of the group, measure verbal reasoning, conceptual abilities and the ability to make abstractions. They assess the student's ability to determine the essential similarity between two items and test similar cognitive skills to the VAT.

The Raven's Standard Progressive Matrices, like the LPAD Variations counterpart, measure non-verbal reasoning. These independent measures formed transfer measures to assess the extent to which cognitive skills taught in the LPAD can be generalised.

4.1.3 Experimental Design.

The design was a Solomon four-group design which involved the subjects being randomly assigned to one of four groups.

Subjects were initially split into two groups, experimental and control. The experimental group was tested on various components of the LPAD using Feuerstein's method of test-teach-test. The control group was tested on the same LPAD components using a traditional, non-interactive administration.

Prior to this, half the experimental and half the control subjects were pretested on components comparable to the LPAD, to control for testing and practice effects. All the subjects were then tested on posttest transfer components similar to the pretest. During the pretest phase those subjects not tested were exposed to an educational video so that all the subjects had an equal amount of exposure to the university environment.

Undergraduate students were trained by postgraduate students to administer the LPAD components in both experimental and control situations. Postgraduate students performed the pre- and posttest administration.

The design is illustrated in the following:

	EXPERIMENTAL		CONTROL	
	Pretest	No pretest	Pretest	No Pretest
GROUP	I	II	III	IV
No. of Ss	24	28	23	25

From Part I the following were established:

- LPAD scores for the selected subjects,
- Posttest transfer scores for the selected subjects.

These results were used in the analysis of Part II of the research.

4.2 PART II

4.2.1 Subjects.

The variation in selection procedures for the Gifted Programme meant that there were large discrepancies between the academic achievements of the different pupils. The fifteen highest achievers and fifteen lowest achievers, based on academic record, were selected from the experimental group; i.e. those subjects who had been tested on the LPAD with mediation. There were sixteen boys and fourteen girls, with an age range from 13 to 19, standards 6 to 9.

4.2.2 Test Materials.

Based on the theory of mediated learning experience, that an intentioned adult interposes her/himself between the environment and the child to mediate the environment to the child, questions were selected to investigate the individual's background.

Currently there is no established measure of mediated learning experience so the questionnaire used in this study cannot be established as reliable and valid. The

questions were therefore selected on their face validity to mediated learning experience. The questionnaire was organised in an interview format and therefore includes questions that attempt to tap MLE as well as other categories of descriptive data. (See appendices for a breakdown of the questionnaire.)

4.2.3 Procedure.

The subjects were interviewed 'blind', ie the tester was not aware whether the subject came from the high or low-achieving academic group. The subjects were seen in a random order on Saturday mornings when the school for the Soweto Gifted Child Programme took place. The interviews each lasted about half an hour to forty five minutes and were performed over a period of about three months. The subjects were given the same instructions (see Appendix A) and the time taken for each interview was noted.

During the interviews subjects answered the questions posed to them while the tester and an assistant noted down the answers. The presence of the assistant enabled the tester to keep appropriate eye-contact with the subjects. At the end of the interview each subject was asked if they had any questions in relation to the

testing.

4.2.4 Experimental Design.

Subjects were selected to form high and low achieving groups to create a disparate sample that would be more likely to show differences in past MLE. In other words it was expected that subjects from the high achievement group would, on the basis of the questionnaire, form a high MLE group and that subjects from the low achievement group would form a low MLE group.

The subjects' responses to the questions that had face validity with mediated learning experience were scored on a one or zero basis, which, therefore, represented presence or absence of mediation. The number of responses for each question were noted and only those questions that appeared to discriminate between two groups were used (questions with an 11-19 split out of 30, or less). Based on their score on these questions two groups of subjects were selected to form a group with a higher amount of child-adult mediated interactions and a group with a lower amount of child-adult interactions, referred to as a high MLE group and a low MLE group respectively. Those subjects that did not have a score that placed them clearly in

one group or the other were not used in the comparisons.

The resulting two MLE groups, drawn from the achievement groups, were then compared on different variables using t-tests. The variables were academic achievement, LPAD scores and posttest transfer measures. As the sample was too small to use discriminant analysis a percentage calculation was used to calculate the proportion of the high MLE group and the low MLE group that contained subjects from the high achievement group and the low achievement group respectively.

CHAPTER V

RESULTS

5.1 Analysis of the Questionnaire.

Of the 21 questions that attempted to tap early child-adult interactions for the presence of mediated learning experience only the following 13 discriminated between two groups.

1. Do you remember . . . reading stories to you ?
2. When you were naughty as a child who disciplined you, told you off ?
3. How were you told about visits to doctors/dentists ?
4. Did you have much to do with your grandparents when you were small, or other old people, grandparent substitutes ?
5. What sort of things did you do with your grandparents when you were small ?

6. Why are your parents' values important to you ?
7. Does your family practice traditional customs ?
8. Will you continue to practice traditional customs ?
9. Why will you speak that language ?
10. What do you know about the history of your people ?
11. Did anyone in your family want to know how you spent your day, who ?
12. Did anyone help you with homework, who ?
13. How were you helped with homework ?

Subjects were scored on these 13 questions and on the basis of their score were selected for the high or low mediation groups. Subjects with a score eight or more out of 13 were considered in the high MLE group and those subjects with five or less out of 13 were considered in the low MLE group. Those subjects with a score of seven or six out of 13 were not placed in either group and not used in the comparisons.

The established high and low MLE groups and the selected

high and low achievement groups were then compared on different variables.

5.2 Establishment of LPAD and Posttest Scores.

Hoffenberg (1988), in the first part of the research, investigated the effect of mediation on cognitive performance and the use of the LPAD in assessment. Scores taken from the LPAD tasks, the Organiser (A), the Verbal Analogies Test and Set Variations I and II, were used to establish an LPAD index.

The score for each task was converted into a percentage. A mean of the sum of the percentage scores was taken resulting in the LPAD index which was expressed as a percentage.

$$\text{ie. LPAD index as \%} = \frac{(\text{Org. A\%} + \text{VAT\%} + \text{Var. I\&II\%})}{3}$$

3

Similarly a posttest index was established using scores taken from the post-LPAD transfer measures, the Organiser (B), The Similarities and Raven's Matrices. The score for each task was converted into a percentage. A mean of the sum of the percentage scores was taken resulting in the posttest transfer index which was

expressed as a percentage.

ie. Posttest index as % = $\frac{I(\text{Org.B\%} + \text{Sim\%} + \text{RSPM\%})}{3}$

3

These indices were then used in the comparisons between the MLE groups and the achievement groups.

5.3 Statistical Analysis.

5.3.1 Proportion of Achievement Groups in MLE Groups.

In order to establish the degree to which the questions used to identify the MLE groups correctly selected subjects from the academic achievement groups a percentage was calculated. A percentage was calculated of the number of high achievement subjects in the high MLE group and the number of low achievement subjects in the low MLE group. In addition an overall percentage was calculated. The high MLE group contained 66.67% high achievement subjects. The low MLE group contained 75% low achievement subjects. Overall 70.8% of the MLE groups contained subjects that were expected to be in each group.

5.3.2 Achievement Scores.

In order to establish that there was a significant difference between the two groups considered representative of high and low achievement on the basis of academic performance, a t-test was used to compare the school performance scores of the two groups.

The mean of the high achievement group is 69.5333% which is higher than the mean for the low achievement group which is 45.4667%. There was a significant difference in school performance between the high and low achievement groups selected for the study on the basis of academic performance, $t=9.47986$ (1.701); $df=28$; $p<0.05$.

In order to test Hypothesis I that the high MLE group will perform higher than the low MLE group in terms of academic achievement, a t-test was used to compare the academic performance scores of the two groups.

The mean of the high MLE group is 61.3333%, and is higher than the mean for the low MLE group which is 50.667%. There was a significant difference in school performance between the groups established from the questionnaire as having had high and low MLE, $t=2.09455$ (1.714); $df=32$; $p<0.05$. Hypothesis I is thus confirmed.

5.3.3 LPAD Scores.

In order to test Hypothesis II that the high MLE group would score higher than the low MLE group on the LPAD scores, a t-test was used to compare the LPAD scores of the two groups.

The high MLE group appeared to have a higher mean of 58.8942% than the low MLE group, which was 55.8408%. However there was not a significant difference between the high MLE and the low MLE groups on the basis of LPAD scores, $t=0.576881$ (1.7174); $df=22$; $p>0.05$. Thus, while the difference was in the right direction, Hypothesis II is not confirmed.

In order to expand Hypothesis II, a comparison was made between the high and low achievement groups to see if there was a difference in the level of LPAD performance. A t-test was used to compare the LPAD scores of these two groups.

The mean for the high achievement group is 55.1487% which is higher than the low achievement group mean of 52.146%. There was a significant difference between the high achievement and the low achievement groups on the basis of their LPAD scores, $t=3.27976$ (1.701); $df=28$; $p<0.05$.

5.3.4 Posttest Scores.

In order to test hypothesis III that the high MLE group would score higher than the low MLE group on the posttest transfer measures, a comparison was made between the scores which indicates the extent to which the mediation received during the LPAD tasks was generalised to different but cognitively comparable tasks. A t-test was, therefore, used to compare these posttest transfer scores between the high and low MLE groups.

The high MLE group has a mean of 63.3509% which is higher than the low MLE group mean of 56.3309%. There was a significant difference between the high and low MLE groups on the basis of the combined post-LPAD transfer measures, $t=1.97366$ (1.725); $df=20$; $p<0.05$. Hypothesis III is thus confirmed.

In addition a comparison was made between the high and low achievement groups on their posttest transfer scores, indicating the extent to which mediation received during the LPAD tasks was generalised to different but comparable tasks. A t-test was used to compare these post-LPAD transfer scores between the high and low achievement groups.

The mean of the high achievement group is 69.2921% which is higher than the low achievement mean of 55.0536%. There was a significant difference between these groups on the basis of the combined post-LPAD transfer measures, $t=3.54617$ (1.7...; $df=26$; $p<0.05$).

CHAPTER VI

DISCUSSION

6.1 Feuerstein's Theory of Mediated Learning Experience.

The hypotheses were the following :

Hypothesis I : The high MLE group will have a higher level of academic achievement than the low MLE group.

Hypothesis II : The high MLE group will have a higher level of achievement on LPAD tasks than the low MLE group.

Hypothesis III : The high MLE group will have a higher level of achievement on transfer tasks comparable to the LPAD tasks than the low MLE group.

Support was given to H I and H III and the null hypotheses were rejected; H II was not supported so the null hypothesis was retained.

Findings related to Hypothesis I.

There was a significant difference between the two groups identified from the questionnaire as having had high and low MLE based on academic performance. This confirms hypothesis I and lends support to Feuerstein's theory that higher amounts of mediated learning experience lead to improved cognitive development and cognitive performance.

Given the Solomon-group design of the overall research, a pretest score was only established for a few of these subjects. In addition there are no standardised measures of cognitive functioning for the population from which this sample was drawn. This means that the two MLE groups were not established as comparable prior to testing on the LPAD and posttest transfer measures. Consequently, it is difficult to isolate effects of past MLE, as the high MLE group may have scored higher than the low MLE group on the basis of intelligence or other factors.

However, given the status of intelligence testing, as outlined in this paper, an 'intelligence' measure independent of the study would only have indicated an individual's IQ performance. In addition, it could be argued that if the two groups were not comparable on

basic intelligence, this in itself could be due in a large part to the experience of mediated learning in early child-adult interactions.

Findings related to Hypothesis II.

There was not a significant difference between the high and low MLE groups on the basis of their LPAD scores, which means rejecting hypothesis II and retaining the null hypothesis. However, there was a significant difference between these two groups on the basis of the posttest transfer measures, the tests comparable to the LPAD tasks. This suggests that there is an incremental ability to benefit from mediation in relation to the amount of MLE already received.

Findings related to Hypothesis III.

As already mentioned the effects of past MLE cannot be clearly isolated from possible confounding factors. However, the effects of MLE are indicated in that a learning effect took place from the LPAD to the posttest transfer measure.

Considering the possibility that past MLE was in part

responsible for the elevated score in the posttest transfer measures, various suggestions can be made for the delayed effects of mediation from the LPAD to these posttest transfer measures. Firstly those subjects with childhood MLE were able to assimilate the process of mediation better than the low MLE group, but only over time so that effects only showed up in the post-LPAD transfer measures. A second possibility is that both groups benefited from mediation during the LPAD but only the high MLE group were able to sustain it. A third suggestion is that the generalisability of mediation, which is the true test of Feuerstein's hypothesis, was only achieved by the high MLE group.

All of these suggestions support the theory that early child-adult MLE interactions assist the child in using further mediation. It also enables the child to generalise that mediation from the specific mediated task to cognitively comparable but different tasks.

Feuerstein's theory is that MLE is the proximal factor in cognitive development. Although factors such as poverty and discrimination may affect the amount and quality of MLE available to the child, they do not directly affect the development of cognitive structures. Even given conditions of disadvantage MLE may and does occur. This is supported by the results of the present

research.

The group of subjects were drawn from a disadvantaged community. In spite of severe socio-political and educational disadvantage, factors Feuerstein describes as distal, these subjects show high cognitive performance. In addition subjects were identified as having had higher and lower amounts of MLE, the subjects from the high MLE group in particular showing high cognitive achievement. The subjects identified as having had MLE in early child-adult interactions showed better academic performance than subjects who fell into the low MLE group. In addition they were better able to use mediation given to them and generalise those learnt skills to comparable but different cognitive tasks.

These findings support Feuerstein's theory that MLE is the proximal factor in the development of cognitive structures. He does not advocate on this basis that social, political and educational change does not need to take place but does emphasise that changing these distal factors will not necessarily result in an improvement in cognitive performance from pupils emerging from such environments.

Intervention and remediation for cognitive dysfunction thus becomes clear and goal-directed. Support for the

role of MLE in the LPAD and in the remediation FIE programmes has already been established although research continues (Skuy & Shmukler, in press).

The present study suggests that not only is mediation valuable for current cognitive modification, but is essential in earlier years.

The implication for intervention is far-reaching. The encouraging results of the present study lead to suggestions of the use of mediation programmes in families with small children and in junior schools, as well as intervention with current performance using the LPAD and FIE.

However, there are drawbacks enough with the implementation of such programmes in current education before considering wider intervention. LPAD assessment and FIE remediation require expensive and intensive teacher-training. They require a large amount of highly skilled manpower which is clearly a problem with most national education systems working to a tight budget. These problems loom even larger when considering all early schooling and parent-child interaction.

For the LPAD and FIE and the concepts of MLE and cognitive structural modifiability to be effective, they cannot only be tools of remediation but need to be

developed in terms of prevention. However, given the huge investment that such a venture would require and noting resistance to projects such as Operation Headstart in the past, extensive and thorough research in support of such a move needs to be established. Although the results of the present study are encouraging, this study is a primary investigation and confirming results are needed.

Finally, this study has also emphasised that such a programme, which involves the liberation of human potential, does not fit well into a society dominated by oppressive laws. It must be considered that a change in society would be needed that it could adopt and implement a progressive educational programme. Support for such a programme would hopefully be a contributor to such a change.

6.2 Implications for Future Research.

Although by no means conclusive the results of the present study are encouraging, and lend support to the hypothesis that mediated learning experience is the proximal factor that affects cognitive development, and further research is indicated.

One alternative would be to use those questions identified in this study as being discriminative of MLE, and then to test a much larger and broader sample. In addition pretests could be performed so that groups could be identified as comparable on intelligence-related factors, thus isolating the effects of MLE to a greater extent. Another alternative would be to conduct a smaller phenomenological study that would more intensively investigate the concept of mediated learning experience in early child-adult interactions.

6.3 Limitations of the Study.

6.3.1 Sample Size.

As this was a primary investigation into Feuerstein's theory of mediated learning experience the sample size is small, namely 30 subjects. This obviously limits the extent to which conclusions can be made and generalised. A follow-up study is clearly indicated using just those questions that seem to be discriminatory for MLE and testing a larger sample.

6.3.2 Restricted Population.

Although the achievement level of the subjects varied significantly enough for a high achieving group and a low achieving group to be identified and selected, all the subjects were taken from the Soweto Gifted Child Programme. This may have affected the results in that subjects from more diverse educational settings may have shown more clear differences in terms of the LPAD scores, and on those questions that appeared to tap MLE and yet were not discriminatory between two groups.

6.3.3 Language.

The interviews were conducted in English and although the subjects were all proficient in the language and it is the language of instruction in the Programme, there are obviously limitations in not using the home language of the subjects.

6.3.4 Ex Post Facto Study.

The study was ex post facto in that the variable of mediated learning experience was not manipulated in the study. This has limitations but the possibility of

manipulating the type of interaction between the child and adult would have ethical (particularly in terms of denying mediated learning experience) and practical problems. An alternative would be to conduct a longitudinal study that would investigate MLE as it was taking place and then compare this to cognitive achievement obtained in the future.

6.3.5 Social / Approval.

Subjects may have subjectively answered the questions in order to appear in a good light. Subjects may have reserved comments that placed themselves or their families in a negative light in order to gain social approval.

6.3.6 Questionnaire Design.

As there is currently no established measure of MLE in early child-adult interactions a measure had to be developed for the purposes of the present study. The results have been encouraging about the value of certain questions in assessing the presence or absence of MLE in these interactions.

Although there were significant differences between the two MLE groups on academic performance and posttest transfer measures, there was not a significant difference between the high and low MLE groups on the LPAD tasks. This suggests that the questionnaire was limited in its ability to identify past MLE, since the high and low achievement groups were significantly different on LPAD scores.

Although the questionnaire was encouraging the results based on the questionnaire need to be viewed with caution. A questionnaire on MLE might need much more elaborate design, construction and validation procedures than conducted in this study. Account needs to be taken of confounding variables such as intelligence. The items identified as discriminative could be used in a more complex investigation.

6.4 Conclusion.

Given the vast numbers of children in this country that come from disadvantaged backgrounds and show poor cognitive performance, it is important to investigate an approach that addresses this issue. Feuerstein's theory of cognitive development states that mediated learning experience is the proximal factor that results in the development of cognitive structures. Disadvantaged in the form of socio-political and educational discrimination that forms the background to this large group, Feuerstein understands as a distal factor which may affect the presence and quality of mediated learning experience but does not directly affect the development of cognitive structures.

In addition Feuerstein claims that although cognitive modifiability can occur as late as adolescence, mediation received in early child-adult interactions is the most effective. Those individuals that had early MLE can be expected to be performing at a higher cognitive level than their counterparts without such MLE.

The results from the present study, although viewed with caution, are encouraging. Subjects identified as having had high MLE were academically achieving at a higher level than subjects identified as having had low MLE.

In addition, although differences were not seen during the LPAD phase, the high MLE group did better than the low MLE group on posttest transfer measures comparable to the LPAD tasks. Various suggestions were posited to explain this delayed reaction:

(1) The subjects with childhood MLE were able to assimilate the process of mediation only over time so that effects showed up in the post-LPAD transfer measures.

(2) Both groups were able to benefit from mediation during the LPAD but only subjects with childhood MLE were able to sustain it.

(3) Only the subjects with childhood MLE were able to generalise the effects of mediation to comparable but different tasks.

All these hypotheses, however, seem to suggest that those subjects with early child-adult interactions containing MLE were not only performing at a higher level academically but were better able to use mediation.

The disadvantaged nature of the group has been emphasised and yet the high performance seen and the presence of mediated learning experience support the theory, that disadvantages are distal factors and that the proximal factor of MLE determines the development of

cognitive structures.

In conclusion, although the limited nature of the questionnaire to measure MLE makes interpretation of the results cautious, this primary investigation forms an important stepping stone for further investigation into early child-adult interactions and the effect of MLE on cognitive performance. Further research, in turn, may eventually lead to intervention in families and schools with an approach that demonstrates a belief in liberating human potential rather than suppressing it.

APPENDIX A

INSTRUCTIONS TO SUBJECTS

This is not a test, there are no right and wrong answers. I want to ask you a few questions about your family, your childhood and your school. They are not personal questions but all the answers will be treated with confidentiality. Only my colleague and I will know that you answered these questions.

Is there anything you want to ask before we start.

I have asked you all these questions is there anything you would like to ask me now.

APPENDIX B

INTERVIEW CONTAINING MLE-TYPE QUESTIONS

HOME

1. Who looked after you when you were a baby and when you were small ?

2. Did someone put you to bed as a small child, who ?

3. Who bathed / dressed you ?

How did you learn to do it yourself ?

4. Who did you eat with ?

How were you taught table manners ?

What do people talk about at dinnertime now ?

5. What games did you play with . . . when you were a child ?

Other adults ?

What was your favourite game ?

What do you like doing now most of all ?

6. Do you remember . . . reading / telling stories to you ? What about other members of the family ?

7. When you were naughty as a child who disciplined you,
told you off ? How ?

8. What happens now when you break the rules ?

9. When . . . was pleased with you what did s/he do when
you were little ?

When people in your family are pleased with you now what
do they do ?

10. Was . . . concerned about your health, about you
being ill or sick ?

How were you told about visits to doctors / dentists ?

11. What kind of people do your parents look up to,
admire, respect ?

SIBLINGS

12. Tell me about your brothers and sisters.

How old are they ?

Which number child are you in the family ?

13. Did you play together a lot as children ?

Were you responsible for the younger ones ?

Were the older children responsible for you ?

14. As children did you have your own play area / eating time or did you mix with the adults in the home ?

GRANDPARENTS

15. Did you have much to do with your grandparents when you were small or grandparent substitutes ?

16. What sort of things did you do with your grandparents ?

17. Did they tell you about when they were your age and other stories ?

RELIGION

18. Does your family go to church ? Which one ?

19. Is it important to your family ?

Is it important to you ?

20. What values are important to your family ?

Are those same values important to you ?

Why ?

CULTURE

21. Which tribes are your family from ?

22. Is that important to you ?

23. Does your family practice traditional customs ?

24. Will you continue to practice those or other traditional customs ?

25. Which language is spoken at home ?

26. Which language will you want to use as your main language when you leave school ?

Why ?

27. What do you know about the history of your people ?

SCHOOL

28. What do you think and feel about school ?

29. How do you get on with the teachers and other pupils ?

Now think back to when you first went to school when you were small and you probably felt quite differently.

30. How were you told about school ?

Did your family make you feel quite excited or was it just something you were told to do ?

31. Did you go to creche or nursery school or stay at home , with whom ?

32. When you started primary school was there anyone at home when you went home after school ?

33. Did anyone in your family want to know how you spent your day ? Who ?

34. Did anyone help you with homework at home ? Who ?
How ?

Does anyone help you now ?

35. What kind of marks / report were you expected to get by your family at primary school / high school ?

36. When you get those marks what is . . . reaction ?

37. What happens if you do not do well ?

38. Did you go to boarding school ?

Contact with family - letters / visits, how often ?

39. How did you get on with teachers, other pupils ?

40. What do you want to do when you leave school ?

41. What do your parents want you to do ?

What do they think of your choice ?

DISCUSSION OF INTERVIEW

All the questions in the interview attempted to tap the quality and quantity of early child-adult interactions. However a large number of the questions asked for descriptive, biographical data that then led up to questions that specifically attempted to access MLE. For example, subjects were asked about how they felt about school at the current time. It was felt that given the explosive nature of black education, negative feelings about school may colour responses about early school experiences. In addition subjects were asked about past and present activities to clarify the distinction between past and present, so that the tester could be sure that past experiences and not current experiences were being tapped.

Given the small size of the sample the descriptive data could not be statistically analysed. However, observing percentages of response by the MLE and achievement groups, there seemed to be no particular trends and there was a wide variety of response. Analysis, therefore, concentrated on responses to the MLE questions.

APPENDIX C

QUESTIONS DISCRIMINATING FOR MEDIATION

1. Who looked after you when you were a baby and when you were small ?

Who put you to bed when you were small ?

Who bathed/dressed you ?

How did you learn to do it yourself ?

Is there a consistent caregiver ? 1 YES

2 NO

2. Do you remember . . . reading stories to you ? 1 YES

2 NO

3. When you were naughty as a child who disciplined you, told you off ? 1 PRIMARY CAREGIVER

2 SOMEONE ELSE

4. How were you told off ?

1 TALKING, WITHDRAWAL OF PRIVILEGES

2 PHYSICAL OR NON-EXPLANATORY DISCIPLINE

5. When . . . was pleased with you what did s/he do when you were little ?

1 PRAISE, TIME TOGETHER, PHYSICAL CONTACT

2 PRESENTS

6. How were you told about visits to doctors/dentists ?

1 SOME EXPLANATION FOR VISITS GIVEN

2 NO EXPLANATION

7. Did you have much to do with your grandparents when you were small, or other old people, grandparent substitutes ? 1 YES

2 NO

8. What sort of things did you do with your grandparents ?

1 INTENTIONAL, NONFUNCTIONAL PASTIMES eg stories, games etc.

2 FUNCTIONAL PASTIMES eg gardening, sewing cooking.

9. Does your family go to church ? 1 YES

2 NO

10. Is it important to your family ? 1 YES

2 NO

11. Why are those values important to you ?

1 GIVE REASONS

2 CANNOT EXPLAIN WHY

12. Is it important to you to be from your tribe ? 1 YES

2 NO

13. Does your family practice traditional customs ?

1 YES

2 NO

14. Will you continue to practice those or other
traditional customs ? 1 YES

2 NO

15. Why will you speak that language ?

1 GIVE REASONS

2 CANNOT GIVE REASONS

16. What do you know about the history of your people ?

1 A LOT

2 NOTHING / NOT MUCH

17. How were you told about school, did your family make
you feel quite excited or was it just something you were
told to do ? 1 EXCITED

2 JUST TOLD TO GO

18. Did anyone in your family want to know how you spent your day, who ? 1 PARENTS OR CAREGIVER

2 OTHERS OR NO-ONE

19. Did anyone help you with homework, who ?

1 PARENTS OR CAREGIVER

2 OTHERS OR NO-ONE

20. How were you helped with homework ?

1 TAUGHT STRATEGIES, GIVEN EXAMPLES

2 GIVEN ANSWERS

21. What kind of marks/report were you expected to get by your fam. ? at primary school ? 1 HIGH

2 AVERAGE

APPENDIX D

TABLE 1 RESPONSE SPREAD FOR SELECTED QUESTIONS

QUESTION NO.	MEDIATION	NO MEDIATION
1	27	3
2	15	15
3	19	11
4	9	21
5	10	20
6	13	17
7	18	12
8	17	13
9	27	3
10	26	4
11	11	19
12	22	8
13	12	18
14	15	15
15	16	14
16	12	18
17	24	6
18	18	12
19	11	19
20	17	13
21	26	4

APPENDIX E

DISCUSSION OF QUESTIONS ATTEMPTING TO DISCRIMINATE FOR MLE

The following mediation type questions had a very high percentage of responses scoring the presence of mediation, and therefore were not able to be used to distinguish between a mediated group and a non-mediated group.

1. Is there a consistent caregiver ? 27/30 - 90% yes responses. According to Feuerstein's theory the presence of MLE is contingent on a consistent and intentional caregiver. However, it would seem that more than the presence of a caregiver is required, and questions that tapped the quality of the interaction between the adult and child seem more discriminative, eg. "Do you remember your caregiver reading stories to you ?" and "How were you told about visits to doctors and dentists ?".

2. Does your family go to church ? 27/30 - 90% yes responses.

3. Is it important to your family ? 26/30 - 86.7% yes responses.

The two questions relating to religion could be

related to Feuerstein's notion of transmission of culture, yet nearly all the subjects responded positively to these questions. In addition :

4. Is it important to you to be from your tribe ?
22/30 - 73.3% yes responses.

This question was also not discriminative. In contrast it would seem that more specific questions about the practice of traditional customs and knowledge of history distinguish between two groups.

5. How were you told about school; did your family make you feel excited or was it just something you were told to do ? 24/30 - 80% yes responses.

Similarly this question would seem to tap a mediating process. However it does not discriminate between two groups.

Finally

6. What kind of marks / report were you expected to get by your family at primary school ? 25/30 - 83.3% high. Feuerstein discusses how low expectations of a child result in a self-fulfilling prophecy, so that the expectation of high marks or low marks may affect those marks. It would seem that the issue is more complex than is suggested by this question, and given the fact that the subjects are all in a gifted programme it is likely that high marks are expected,

regardless of the varied level of academic performance that is actually exhibited.

The following were the questions used to select the MLE groups :

1. Do you remember . . . reading stories to you ?
2. When you were naughty as a child who disciplined you, told you off ?
3. How were you told about visits to doctors / dentists ?
4. Did you have much to do with your grandparents when you were small, or grandparent substitutes ?
5. What sort of things did you do with your grandparents when you were small ?
6. Why are those values important to you ?
7. Does your family practice traditional customs ?
8. Will you continue to practice traditional customs ?
9. Why will you speak that language ?

10. What do you know about the history of your people?

11. Did anyone in your family want to know how you spent your day, who ?

12. Did anyone help you with homework, who ?

13. How were you helped with homework ?

On the basis of these questions that were selected as being discriminatory the subjects were assigned to a high or a low mediation group. This resulted in 12 subjects in each group and six subjects with an even score (ie 6/13 or 7/13).

APPENDIX F
TABLE 2 RESPONSES BY SUBJECT TO SELECTED QUESTIONS

SUBJECT NO.	MEDIATION	NO MEDIATION
1	9	4
2	4	9
3	4	9
4	9	4
5	4	9
6	5	8
7	5	8
8	7	6
9	9	4
10	5	8
11	6	7
12	9	4
13	7	6
14	12	1
15	5	8
16		7
17		3
18	6	7
19	2	11
20	3	10
21	10	3
22	9	4
23	6	7
24	8	5
25	9	4
26	9	4
27	3	10
28	8	5
29	5	8
30	0	13

APPENDIX G
TABLES OF MEANS

TABLE 3 OVERALL MEANS FOR ACHIEVEMENT GROUPS

DEPENDENT VARIABLE	ACHIEVEMENT LEVEL	
	HIGH	LOW
ACADEMIC PERFORMANCE	69.5333	45.4667
LPAD SCORES	65.1487	52.1460
POSTTEST SCORES	66.2921	55.0536

TABLE 4 OVERALL MEANS FOR MLE GROUPS

DEPENDENT VARIABLE	ACHIEVEMENT LEVEL	
	HIGH	LOW
ACADEMIC PERFORMANCE	61.3333	50.6667
LPAD SCORES	58.8942	55.8408
POSTTEST SCORES	65.3509	56.3309

APPENDIX H

TABLES OF t-VALUES

TABLE 5 t-TEST FOR ACADEMIC PERFORMANCE BETWEEN ACHIEVEMENT GROUPS

ACHIEVEMENT GROUP	N	VARIANCE	SD	DF	t-VALUE
HIGH	15	33.5524	5.79244	28	9.47986
LOW	15	63.1238	7.94505		

TABLE 6 t-TEST FOR ACADEMIC PERFORMANCE BETWEEN MLE GROUPS

ACHIEVEMENT GROUP	N	VARIANCE	SD	DF	t-VALUE
HIGH	12	163.879	12.8015	22	2.09455
LOW	12	147.333	12.1381		

TABLE 7 t-TEST FOR LPAD SCORES BETWEEN ACHIEVEMENT GROUPS

ACHIEVEMENT GROUP	N	VARIANCE	SD	DF	t-VALUE
HIGH	15	118.544	10.8878	28	3.27976
LOW	15	117.217	10.8267		

TABLE 8 t-TEST FOR LPAD SCORES BETWEEN MLE GROUPS

ACHIEVEMENT GROUP	N	VARIANCE	SD	DF	t-VALUE
HIGH	12	137.417	11.7225	22	0.57686
LOW	12	198.752	14.0979		

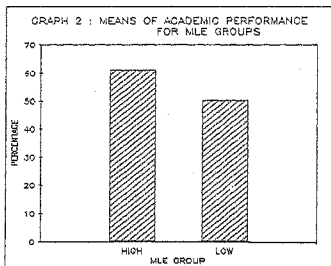
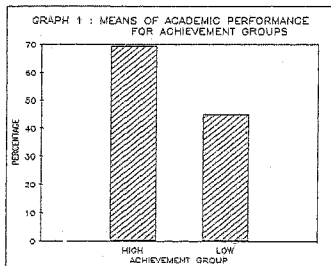
TABLE 9 t-TEST FOR POSTTEST SCORES BETWEEN ACHIEVEMENT GROUPS

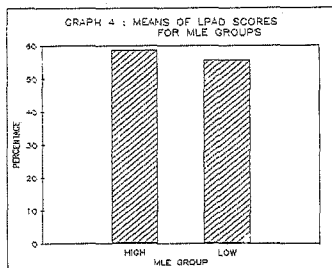
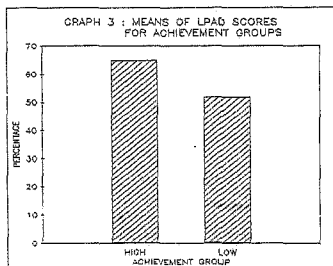
ACHIEVEMENT GROUP	N	VARIANCE	SD	DF	t-VALUE
HIGH	14	110.121	10.4939	26	1.54617
LOW	14	84.9932	9.21918		

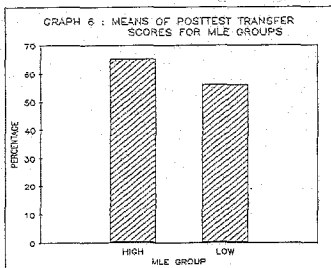
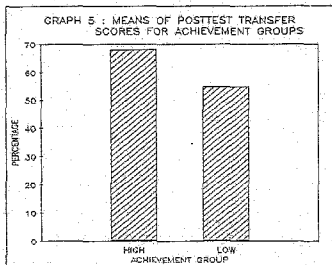
TABLE 10 t-TEST FOR POSTTEST SCORES BETWEEN MLE GROUPS

ACHIEVEMENT GROUP	N	VARIANCE	SD	DF	t-VALUE
HIGH	11	79.7178	8.92848	20	1.97366
LOW	11	150.034	12.2489		

APPENDIX I
GRAPHS OF GROUP MEANS







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