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COMPARISON OF THE KAUFMAN ASSESSMENT BATTERY AND THE WECHSLER INTELLIGENCE SCALES FOR LEARNING DISABLED BLACK AND WHITE CHILDREN.

by Mandy Taylor

A dissertation submitted to the Faculty of Education, University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the degree of Masters of Education (Educational Psychology).

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JOHANNESBURG, 1998

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by Mandy Taylor

DECLARATION

I declare that this dissertation is my own, unaided work. It has been submitted for the degree of Masters of Education in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

M Taylor

20 day of February, 1998

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ABSTRACT

This study examined the performance of black and white learning disabled South African children on the Kaufman Assessment Battery for Children (K-ABC) and the Wechsler Intelligence Scales for Children - Revised and Third Edition (WISC-R/WISC-III). The K-ABC and WISC-R/WISC-III were administered to 34 white children and 21 black children aged 6 to 11 years (mean 7-9 years) at private remedial schools. The mean WISC-R/WISC-III Full Scale IQ for blacks was 84.19 (*SD* = 7.41) which was significantly lower than the mean Full Scale IQ for whites which was 93.97 (*SD* = 11.13). The difference between their scores on the K-ABC Mental Processing Composite was not significant. For the black sample, the WISC-R/WISC-III Full Scale IQ was significantly lower then the K-ABC Mental Processing Composite (t= 6.9, p<.001). Additionally, the performance of the black sample on the Verbal subscale of the WISC-R/WISC-III, as well as their scores on various subtests that constitute the acquired learning cluster (Vocabulary and Information), were found to be significantly lower than those of the white sample. A qualitative examination of teachers' ratings of intellectual potential suggested that the K-ABC is a more equitable measure of intelligence for black South African children. The results supported the utility of the K-ABC as a non-discriminatory instrument which may be a viable alternative to the WISC-R/WISC-III for South African children.

Keywords:

Kaufman Assessment Battery for Children
Wechsler Intelligence Scale for Children
Intelligence testing
Cognitive assessment
Psychological assessment in South Africa
Learning potential
Learning difficulties
Education

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1) INTRODUCTION

This study examines the differential performance of a sample of black and white learning disabled children in South Africa, on the Wechsler Intelligence Scales for Children [both the Revised (WISC-R) and Third Edition (WISC-III)] and the Kaufman Assessment Battery for Children (K-ABC). It sets out to investigate which measure provides a more equitable indicator of intelligence across the two groups.

The main concern of this study is whether the WISC-R/WISC-III and the K-ABC have differential validity for different cultural groups in South Africa. Since the developers of the K-ABC claim that the test is a relatively non-discriminatory instrument regardless of population group (Valencia & Rankin, 1988), this study aims to evaluate this assertion in an attempt to find an unbiased assessment tool for South African children.

The motivation for comparing a black and white sample in South Africa is the tendency of traditional intelligence tests to misclassify culturally disadvantaged groups. Evidence has suggested that conventional intelligence tests are biased in favour of white, middle-class children and not suitable for use with populations that are culturally different (Flanagan, 1995; Fourqurean, 1987; Helms, 1992; Kaufman & Kaufman, 1983; Kriegler & Skuy, 1996). Since intellectual assessment is a primary tool for identifying children who would benefit from special services, it has become important to validate intelligence tests separately for various cultural groups in South Africa.

This study is merely exploratory in that it is based on post hoc data obtained from a sample of black and white children in a private remedial school. The sample in this study is circumscribed and is not representative of the overall black and white majority, therefore limiting the generalizability of results. It is, however, hoped that results from this study will serve as an impetus for further research with a more representative study.

The study is accomplished by comparing the documented results of 34 white and 21 black children on the WISC-R/WISC-III (See Appendix 4) with their results on the K-ABC to establish which test provides a more equitable estimate of intelligence. Scores are

statistically analyzed to examine differences in results in the two population groups. This study is limited in that no quantifiable criterion reference is available to establish external validity. Qualitative, teacher ratings of interest are used as a tentative indication of external validity, although this is an area which needs to be assessed further.

2) LITERATURE REVIEW

2.1) Assessment within the South African context

Intellectual and academic assessment within South Africa poses a particular challenge. Decades of apartheid has resulted in immense inequalities in the standard of education. This has resulted in huge proportions of scholastic failure, dropping out and underachievement in black education (Kriegler & Skuy, 1996). While post apartheid South Africa attempts to redress many of the obvious educational inequalities such as size of class, teacher qualifications, funding disparities, facilities and equipment, etc. many children are still affected by educational and structural disadvantage. These children are in a sense "learning disabled" to the extent that they are unable to take advantage of the meagre educational opportunities offered to them.

Assessment in order to redress some of these difficulties has often only served to perpetuate social and economic injustices as approaches to assessment have typically been discriminatory. Kriegler and Skuy (1996) argue that assessment has typically focused on the learning problem of the individual child while ignoring structural inequalities inherent in the child's ability to acquire knowledge. This "child deficit" model has served to maintain the status quo and has had little value in planning educational intervention, especially within South African society. Indeed, Kriegler and Skuy argue that South Africa cannot "afford the luxury of specific learning disabilities for a seemingly arbitrarily selected, elite group" (p. 111). Due to the magnitude of the problem, labels of learning disability are superficial, arbitrary classifications which serve to exclude millions of children who need special assistance.

While there is a general recognition of the inadequacy of conventional intelligence tests and their tendency to misclassify disadvantaged students as mentally retarded, the dearth of alternative methods of assessment has lead to the perpetuation of discriminatory testing. Kriegler and Skuy argue that despite the growing consensus that children's learning problems must be viewed contextually, assessment often obscures this due to its

medical frame of reference. Little progress has been made towards shifting these underlying assumptions and philosophies towards unbiased assessment procedures.

Helms (1992) argues that while it has become an accepted fact in psychometric literature that the average score of different racial groups on cognitive ability tests differs, sometimes quite dramatically, psychologists have come to no conclusions about how to interpret racial differences in performance or whether tests have comparable meaning within different groups. In line with Kriegler and Skuy (1996), Helms argues that psychologists have failed to conceptualize differences in intellectual functioning adequately. She proceeds to adopt a more contextual, cultural perspective of cognitive ability. She argues that the biological and environmental understanding of culture has proved to be insufficient in its conceptualizations of culture, obscuring meaningful interpretations about the differences in performance on cognitive ability tests.

A culturalist perspective attempts to describe how the characteristics of individual cultural groups influence their performance on intellectual tests (Helm, 1992; Miller-Jones, 1989). According to cultural practice theory, culture is thought to influence cognitive processing according to the kinds of activities engaged in and competencies required for specific tasks within cultural contexts. Thus an individual's interpretation of a task depends on previous cultural experiences which in turn regulates a person's access to certain concepts and processes (Miller-Jones, 1989). A test item is only culturally fair to the extent that it is perceived in the same way by all individuals taking the test. Since the current collection of psychometric tests are based on Western-American acculturation, it is questionable the extent that black South Africans perceive items within the equivalent conceptual framework as their white counterparts. In addition to differences in cultural contexts, black children in South Africa have also been exposed to structural disadvantages which have served to further limit their exposure to concepts typically included in intelligence tests.

Helms suggests that the dimensions thought to characterise each group such as; behaviours, beliefs and values should be specified and assessed independently of test performance in order to make a persuasive cultural difference argument. Assessment should occur at the level of systematic analysis of the particular context (Kriegler & Skuy,

1996). While culture fair testing has been proposed as an alternative to traditional tests, Helms criticizes culture fair testing as it attempt to control the effects of culture rather than measure them. She questions whether it is possible to control culture if it has not been conceptualized properly.

Cultural diversity has certainly not been conceptualised properly in South Africa. The task of specifying the "demographic, typological and psychological dimensions that makes groups distinct" (Helms, 1992, p. 1098) is a lofty one considering the cultural diversity in South Africa. To apply a context-specific approach to testing would involve the development of a theory of contexts to determine task equivalence (Miller-Jones, 1989). While this may be the objective that test developers should endeavor to attain, lack of resources and the need for hasty solutions may preclude this option at present. Failing this, the current study argues for a more universal conceptualisation of cognitive functioning as a starting point for more equitable and effectual assessment.

Miller-Jones (1989) concedes, despite his culturalist perspective, that tests based on theoretically defined criteria of skill attainment are preferable to norm referenced tests based entirely on age or grade norms. The current study attempts to evaluate this proposition by utilising the Kaufman Assessment Battery for Children (K-ABC) as an alternative to conventional tests in South Africa.

The K-ABC attempts to embrace a more theoretical position, through carefully outlining the underlying cognitive processes elicited by test items. However, the K-ABC does this in the context of a universalist as apposed to a culturalist perspective. That is the K-ABC attempts to delineate universal cognitive processes believed to be characteristic of all individuals regardless of cultural affiliations. The K-ABC, in a sense, challenges Helms arguments in its attempts to transcend variables such as culture, through its foundation in universal cognitive processes. Whether this is in fact possible, in the light of the culturalist perspective, is questionable. However, with limited alternatives, it may be possible to view more theoretically based tests through a culturalist lens, recognising that differences in performances represent differences in representations of knowledge.

In our attempts to refine assessment procedures towards more equitable solutions for assessing disadvantaged children, it is important not to lose sight of the purpose served by testing within apartheid South Africa. It is important to acknowledge that assessment has been a "political activity" which has been "used to preserve and perpetuate social, economic and political structures" (Kriegler & Skuy, 1996, p.114). If educational disadvantage is to be addressed in South Africa, then assessment should be used as a tool to provide change.

Kriegler and Skuy (1996) argue convincingly that assessment should be aimed at helping pupils learn and providing the tools for teachers to teach them better. It is important that this occurs within the context of structural changes to education systems in order to provide the educational facilities for primary prevention and intervention. Despite the failings of assessment in the past, Kriegler and Skuy acknowledge that there is a place for assessment in South Africa if the structural and contextual factors that influence cognitive functioning are appreciated. Assessment can play an important role in generating practical educational alternatives in South Africa.

Thus, this study hopes to initiate a process of examining alternative, more viable solutions to assessment in South Africa. The researcher embarks on this rather imposing task with the recognition that the means to change within education in South Africa is ultimately through the massive restructuring and redistribution of resources. Equitable assessment practices which are geared towards practical solutions are only a tiny step towards redressing the structural and racial disadvantage that characterise South African education. This study aims to take the first step towards finding a non-discriminatory assessment battery.

2.2) Rationale for the Kaufman Assessment Battery for Children (K-ABC): Its theoretical foundation

2.2.1) The Achievement Versus Intelligence Debate

The impetus for the development of the Kaufman Assessment Battery for Children (K-ABC) was originally the creators' desire to merge neuropsychological and cognitive theories with measures of intelligence. They thus challenged existing definitions of intelligence, which they criticized for their achievement based orientation and their lack of a sound theoretical base reflecting an understanding of the cognitive processes underlying intelligence. Kaufman and Kaufman (1983) defined intelligence as "the individual's style of solving problems and processing information." (p.2). The K-ABC thus embodies the shift from assessment as merely classificatory towards the identification of cognitive processes related to academic difficulties in order to facilitate instructional programs.

The basis for the K-ABC is consonant with the general paradigm shift described by Das (1992) as the move from a unidimensional scale of merit concerned with the measurement of general ability, to the emphases on the analysis of many dimensions of intelligent behaviour. The K-ABC has attempted to embody in its construction three aspects for a comprehensive system of cognitive testing, prescribed by Das. Das proposes that all tests should provide: norms to compare individuals to others similar to them; profiles of cognitive processes and functioning, and prescriptions for training and remediation of identified cognitive difficulties. While traditional psychometric measures of assessment do provide reliable measures of competence, they do not go beyond this, therefore limiting their utility. Das therefore commends the K-ABC for its attempt to operationalize all three objectives of assessment.

Kaufman and Kaufman have clearly delineated their own specific goals in the K-ABC Interpretive Manual as:

"1. to measure intelligence with a strong theoretical and research basis
2. to separate acquired factual knowledge from the ability to solve unfamiliar problems
3. to yield scores that translate to educational intervention
4. to include novel tasks
5. to be easy to administer and objective to score
6. to be sensitive to the diverse needs of preschool, minority group and exceptional children" (Kaufman & Kaufman, 1983, p. 5).

Traditional intelligence tests, such as the Wechsler Intelligence Scales for Children (WISC-R/WISC-III) have been criticized due the fact that their construction was governed primarily by empiricism without cognisance of numerous theoretical developments in neuro- and cognitive psychology (Kamphaus, 1990). Evidence for the verbal/non-verbal dichotomy has been questioned as mental processing models have shown that various cognitive functions are in operation regardless of the verbal or non-verbal nature of the stimulus (Kamphaus, 1990). Taking cognisance of these incongruencies, the K-ABC test developers attempted to integrate psychometric and information-processing paradigms (Sternberg, 1984). The Wechsler Scales are said to be content-oriented due to the classification of their items into verbal and non-verbal domains, whereas the K-ABC scales are more process-oriented (Kaufman & Kaufman, 1983). There has thus been a move towards the study and classification of the underlying cognitive processes that influence intelligent behaviour.

Kaufman and Kaufman (1983) further criticized the underlying premise of the Wechsler Intelligence Scales for Children (WISC-R/WISC-III); that current manifest ability can be used as a predictor for future functioning. The developers of cognitively motivated assessment batteries, such as the K-ABC, questioned the extent to which a child's educational difficulties are a function of the child's ultimate potential for learning. Kaufman and Kaufman recognized that the child's current ability, as measured by achievement based intelligence tests (WISC-R/WISC-III), is defined by previous learning and context and not necessarily by an innate ability (Minick, 1987). Based on Cattell's approach to intelligence, Kaufman and Kaufman conceptualised tests like the Wechsler Intelligence

Scales for Children (WISC-R/WISC-III) as measuring crystallized intelligence, whereas models based on underlying cognitive processes, such as the K-ABC Mental Processing Composite are believed to measure fluid components of intelligence (Kaufman & Kaufman, 1983).

Kaufman and Kaufman included an Achievement scale in their battery as their measure of crystallized intelligence. Studies cited in the manual (Kaufman & Kaufman, 1983) show that the K-ABC Achievement Scales correlate more highly with the WISC-R's Verbal and Full-Scale scores than does the K-ABC Mental Processing Composite (MPC). Kaufman and Kaufman interpret this as implying that the WISC-R is more a measure of achievement than innate intelligence (Kaufman & Kaufman, 1983; Keith, 1985). Thus the MPC scales are proposed as better measures of actual ability.

Naglieri and Das's (1990) comparison between the WISC-R and the K-ABC supports Kaufman and Kaufman's supposition that the WISC-R is largely dependent on acquired knowledge. They aggregated the loadings of three factor analysis papers on the WISC-R and K-ABC subtests [by Kaufman and Mclean (1987), Keith and Novak (1987), and Naglieri and Jensen (1987)] in order to combine the data into a comprehensive summary. The data was summarised into a comparable three factor model (See Appendix One). The first factor included the WISC-R verbal comprehension subtests as well as the Arithmetic subtest and the K-ABC Achievement Scale subtests. The interpretation of the WISC-R Verbal Scale as an achievement measure is therefore supported if one considers that WISC-R verbal subtests load together with the K-ABC subtests specifically geared towards the measurement of achievement. Naglieri and Das thus concluded that what these WISC-R and K-ABC subtests have in common is their dependence on acquired knowledge. The K-ABC Mental Processing Composite subtests loaded separately on the other two factors suggesting their independence from acquired/crystallized knowledge.

These findings are corroborated by Childers, Durham and Bolen (1985) in their comparison of the K-ABC Mental Processing Composite and Achievement Scale with the Californian Achievement Test (CAT). They found that the K-ABC Achievement Scale correlated higher with the CAT subtest scores and CAT total score, than with the Mental Processing

Composite, supporting the differential validity of the K-ABC Achievement and Mental Processing Scales. Childers et. al. concluded that intelligence and achievement are not identical constructs, which is a fundamental tenet in the development and construction of the K-ABC.

Studies, cited in *The Interpretive Manual*, designed to validate the K-ABC through examining its correlation with other tests also provides interesting evidence for the achievement/ability dichotomy. In a sample of normal children, the K-ABC Achievement Scale correlated more highly with the WISC-R Verbal IQ than Performance IQ because of the linguistic, cultural and academic factors inherent in both the K-ABC Achievement and WISC-R Verbal Scales. The Mental Processing Composite correlated equally with Verbal and Performance IQs, suggesting that the cognitive abilities measured extend across the Verbal and Performance domain.

Interestingly, a slightly different scenario was evident in exceptional samples. Findings for learning disabled and behaviourally disordered groups differed in that there was a higher relationship between the K-ABC Mental Processing Composite and the WISC-R Performance IQ than the Mental Processing Composite and the WISC-R Verbal IQ. The same pattern was also evident in educable mentally retarded children and culturally disadvantaged groups. Kaufman and Kaufman (1983) explained this as a function of limited verbal abilities within these exceptional samples, concluding that "the problem-solving abilities required for success on the K-ABC Mental Processing Composite may correlate well with WISC-R Verbal IQ for children with normal language development and school achievement, but this relationship may be attenuated for children whose Verbal IQ is depressed by language or school-related difficulties, and therefore does not truly reflect their 'intelligence.'" (p. 112). The implications of these findings have particular diagnostic value because it is evident that, by using the K-ABC children will be less likely to be labeled as mentally retarded when their deficiencies are a function of both linguistic and cultural disadvantage and subsequent deficient school achievement.

Another factor of contention in the intelligence testing debate has been the issue of the *g* factor; "the unrotated first factor that is interpreted as the dimension of general intelligence

that is measured in varying degrees, by all cognitive tasks" (Kaufman and McLean, 1987). Those who adhere to a traditional model base many of their arguments on the contention that a high loading on *g* reflects general intelligence and therefore tests which measure this factor are appropriately called intelligence tests (Kaufman & McLean, 1987; Jensen, 1984). In Kaufman and McLean's (1987) study which compared the *g* factors of the K-ABC and the WISC-R in a sample of normal children, the *g* factors of both were found to be highly correlated (.89). This suggests that they are at least equal measures of general intelligence. Despite this, Kaufman and McLean questioned the basic concept of *g* based on the contention that the subtests which loaded the highest on the *g* factor in both the K-ABC and the WISC-R were the subtests most related to acquired knowledge (K-ABC Reading/Understanding and Riddles and WISC-R Information and Comprehension). Kaufman and McLean therefore ask whether the *g* factor is really a measure of general intelligence as apposed to general achievement.

Despite this contention, the concept of "g" is still a popular one, deserving consideration. Jensen's (1984) critique of the K-ABC is based on his belief that the K-ABC is a lesser measure of *g* than other more popular intelligence tests. He argues that all test batteries measure *g* to some extent regardless of the particular content or collection of subtests. "This means that for the purpose of indicating the amount of *g* possessed by a person, any test will do just as well as any other, provided only that its correlation with *g* is equally high" (Spearman, 1927, quoted in Jensen, 1984, p. 382). This is where the K-ABC is said to be deficient, as it is argued that in Kaufman and Kaufman's attempts to measure other factors besides *g* (Sequential Processing, Simultaneous Processing, Mental Processing, Nonverbal and Achievement) they have diluted the K-ABC's ability to measure *g* on the Mental Processing Composite, as compared to the Stanford - Binet and the WISC-R. Jensen explains that according to Spearman's hypothesis most of the *g* factor in a test is constituted by the sum of the covariances on a number of diverse subtests. Since the K-ABC isolates a small group of homogenous subtests which make up the two main diagnostic scales, it restricts the covariance that exists among the subtests and therefore the amount of *g* that is measured by part scores. This in turn diminishes the amount of *g* measured in the K-ABC.

Kaufman, (1984) in response to Jensen's criticisms, argues that the K-ABC was not intended as a simple measure of *g*, and that if we were to resort a *g* interpretation of the K-ABC we would be regressing to a previous generation of testing focused on the mere quantification of intelligence. Indeed Das et. al. (1990) endorse as a positive attribute, the fact that simultaneous and sequential processing exist apart from a general factor in the K-ABC. The Kaufman and Kaufman assessment philosophy is a testament to the rejection of the concept of *g* and the acceptance of a more equitable solutions to the process of intelligence testing; that of delineating profiles of cognitive strengths and weaknesses for intervention.

2.2.2) Simultaneous and sequential processing

The K-ABC Mental Processing Scale was divided into a Simultaneous and Sequential Scale based on the review of a number of neuropsychological and cognitive theories, in line with Kaufman and Kaufman's desire to create a theoretically sound measure of cognitive ability. The *Interpretive Manual* (c.f. Kaufman & Kaufman, 1983) outlines comprehensively how the simultaneous/sequential model have been incorporated into the test construction. A brief summary should therefore suffice for the purpose of this study.

The two types of processing have been labeled differently by different cognitive- and neuro-psychologists: sequential/parallel, serial/multiple, successive/simultaneous, analytic/gestalt-holistic, propositional/appositional, sequential/synchronous (c.f. Kaufman & Kaufman, 1983). The K-ABC attempted to extract the main concepts that run through several theoretical paradigms, leading to the conclusion that sequential and simultaneous processing are central (Kaufman & Kaufman, 1983; Kamphaus, 1990). The two types of mental processing are defined as follows:

- "Sequential - This type of mental processing emphasizes the serial or temporal order when solving problems.
- Simultaneous- This process demands a gestalt like, frequently spatial, integration of stimuli to solve problems" (Kamphaus, 1990, p.360).

The main aspect of sequential processing is that it involves the ordering of task elements that are linearly related. Simultaneous processing requires surveying and synthesizing interrelated elements. Kaufman and Kaufman (1983) recognised that real world activities do not reflect one kind of processing alone, generally involving a combination of both processes. Thus according to their model, academic problems may occur when there is a contrast between the demands of a task and an individual's relative sequential or simultaneous processing difficulties (Kline, Snyder & Castellanos, 1996).

Sequential and simultaneous processing have been linked to the cerebral specialisation of the brain (Morris & Bigler, 1987) with different neuropsychologists identifying different localised regions for each function. Kaufman and Kaufman were not interested in highlighting localised neurological deficiencies as such, but rather they wanted to identify profiles of cognitive strengths and weaknesses in order to direct instruction. Neuropsychological research into cerebral specialisation merely supplied Kaufman and Kaufman with further support for the theoretical foundations of the K-ABC.

An important consideration for Kaufman and Kaufman when developing the K-ABC was not to merely replicate and add another comparable measure of intelligence to the already adequate supply. They were not merely attempting to provide a more viable alternative to existing measures but rather to create a useful measure of cognitive processing. The extent to which the K-ABC achieves this uniqueness is therefore relevant.

Zins and Barnett (1984) defend of the utility and uniqueness of the Sequential/Simultaneous diagnostic scales of the K-ABC, in a study which compared the K-ABC, the WISC-R and the Stanford-Binet for 40 children with no known impairments. The K-ABC Mental Processing Composite was moderately correlated with the Stanford Binet ($r = .69$) and highly correlated with the WISC-R Full Scale ($r = .79$) suggesting possible redundancy in the overall measures. Yet on closer investigation, most of the WISC-R subtests did not yield strong correlations with either the Sequential or the Simultaneous scales. The correlation between the Sequential and Simultaneous scales was also low, endorsing the independence of these two scales.

2.2.3) Construct Validity

The construct validity of the sequential/simultaneous model is fully documented in *The Interpretive Manual.* Kaufman and Kaufman (1983) approached the task of establishing construct validity using multiple dimensions identified by Anastasi as being elements of a test's construct validity: "developmental changes, internal consistency, factor analysis, convergent analysis and discriminant validation, and correlations with other tests." (p. 99) Subsequent studies have been administered to further evaluate the construct validity of the K-ABC.

Goldstein, Smith and Waldrep (1986) tried to establish the construct validity of the K-ABC by comparing results on the Mental Processing Composite to results on various other tests. The K-ABC Simultaneous Scale was found to be more highly related to tests of language and general ability than the Sequential Scale. They argued that this provided some support for the theories that underlie the development of the K-ABC as the tasks within the study appeared to demand more simultaneous than sequential processing, which reflected the pattern of correlations they found.

In *The Interpretive Manual*, factor analytic studies were used primarily to provide strong support for the validity of the two-factor structure of the Mental Composite Scale (c.f. Kaufman & Kaufman, 1983). In Kaufman and Mclean's (1987) later factor analytic study, comparing the K-ABC and the WISC-R, further support was provided for the factor structure of the K-ABC Mental Composite and Achievement Scale. When K-ABC subtests were factor-analyzed together, this resulted in a structure that accorded with the analyses in the standardization sample of the K-ABC scale - Sequential Processing, Simultaneous Processing and Achievement. This compared favourably with the results of a confirmatory factor analytic study conducted by Keith (1985).

Keith's findings, did however, show some inconsistencies. While he identified similar factorial clusters, he argued that the factors derived are possibly best described differently; as verbal and verbal-mediated memory (sequential), verbal reasoning (achievement), and nonverbal reasoning skills (simultaneous), as well as two measures of reading

achievement. In numerous other factor analytic studies, such as that of Goldstein, Smith and Waldrep (1986), other interpretations of the K-ABC factor solution have also been proposed. Thus, the Sequential/Simultaneous dichotomy used to label the K-ABC subscales has been questioned.

Das (1984) argues that the K-ABC's two factor structure is open to alternative interpretations not due to inadequacies in the conceptual framework, but rather due to the inadequacies in the operationalization of successive and simultaneous processes. He stated that, while the K-ABC has initiated the task of constructing a process-based test of cognitive functioning, the simultaneous and successive scales of the K-ABC can be alternatively conceptualized as spatial and verbal memory respectively. Das pinpoints the absence of a verbal, simultaneous processing task on the Simultaneous Scale as an issue of contention because one of the assumptions of Kaufman and Kaufman's model is that processing is independent of the modality. Das notes that the three subtests included in the Simultaneous Scale are all visual. He argues that this, together with the exclusion of an auditory task renders the scale open to alternate explanations. Similarly the Successive Scale's reliance on memory factors renders it open to alternative labeling. Thus, it appears that Kaufmans' decision to exclude verbal tasks in order to maintain cultural fairness may have lessened the utility of the battery in terms of the range of skills that it assesses.

Kaufman and McLean (1987) argue that alternative explanations of the K-ABC scales are as logically defensible as the original formulation of the factors. They state that various interpretations of the factors are possibly so inextricably linked that there are no "pure" criteria for each of the abilities measured. Kaufman and McLean therefore contend that, since the K-ABC and the WISC-R subtests loaded on the same three factors when jointly analysed, the interpretations of both K-ABC and WISC-R factors have to rely on an individual's personal theoretical orientation. Thus if one adheres to a cognitive neuropsychological approach, then simultaneous, sequential, and achievement would be the labels of choice for each factor, while adherence to a different theoretical model may lead to alternative conclusions. Such a flexible approach allows for a diversity of opinions, although it militates somewhat against the fundamental tenet of the K-ABC which is to measure intelligence based on a sound theoretical and research base (Kaufman &

Kaufman, 1983). Indeed, the arbitrary labeling of factors without close adherence to a sound theoretical base precludes a useful understanding of intelligence scales. Since utility is the optimal word here, the extent to which the Simultaneous/Sequential framework provides opportunities for useful intervention will determine its ultimate utility as an interpretive framework.

In certain individual cases Kaufman (1984) does acknowledge that a flexible approach to the interpretation of tests may be viable depending on the profile of the individual. He states, "one should always challenge the "goodness of fit" of a test author's model to the profile fluctuations exhibited by any given child, and one must be ready to replace the author's model with a new one" (p. 431).

Kline, Snyder and Castellanos (1996) reach the same conclusion in their overview of research on the K-ABC. They endorse research regarding the inadequacy of the operationalization of the Simultaneous and Sequential Scales. However, they recognise the difficulty in constructing simultaneous and sequential tasks that are not based on visual-spatial stimuli or the recall of serially presented information, respectively.

Bracken (1985) in his critical review of the K-ABC argues that, by minimizing the language requirements of the K-ABC, the developers in fact minimized the cognitive complexity measured by the battery. This seems to be confirmed in part by Kline et. al. (1992) in their comparison of the cognitive complexity of the K-ABC and the WISC-R. They found that the abilities measured by the K-ABC mental processing scale are generally not as complex as those measured by the WISC-R. Yet, when both the Mental Processing Composite and Achievement Scale are administered, overall complexity level is equivalent. Since the Mental Processing Composite is often used in isolation as a definitive measure of intelligence (as in the current study), this relative lack of complex problem solving tasks, may in fact reduce the utility of the K-ABC as an intelligence measure.

By isolating the underlying cognitive abilities involved in general problem solving, Kaufman and Kaufman may have sacrificed the cognitive complexity of skills measured. Yet, by breaking down problem solving skills into their most basic parts the K-ABC is able to assess

the level at which cognitive functioning is deficient, in order to address remediation at the learner's most fundamental level of impairment. Overall, Kline et. al. commend the K-ABC for its clear articulation of its underlying theoretical rationale, as well as its intent to assess cognitive skills relevant to academic achievement.

Despite its merits, criticisms should be acknowledged that have pointed to the need for the addition of more complex problem-solving tasks to assess the individual's ability to plan and structure problem solving behaviour (Das, 1984; Das, Mensink & Janzen, 1990; Naglieri & Das, 1990). As it stands, the K-ABC may not be a definitive measure of simultaneous and successive processing. This does not, however, mean that the theoretical framework upon which the K-ABC was based is faulty, rather that improved methods of measuring these constructs are needed.

Das and Naglieri (1997) have recently developed a new assessment battery, the Das-Naglieri Cognitive Assessment System (CAS), which attempts to address some of the criticisms of the K-ABC, while still maintaining many of its underlying theoretical tenets. This assessment battery adds the dimensions of Planning and Attention as an extension of the Kaufmans' Simultaneous/Sequential model. This four dimensional PASS (Planning, Attention, Simultaneous, Successive) model is proposed as a more complex representation of cognitive functioning. Whether the CAS succeeds as the definitive method of intellectual assessment is still uncertain, although its development certainly sets the path for future research.

2.3 Validity of the K-ABC across cultural groups

Much criticism has been leveled at the K-ABC in terms of its validity especially in terms of its claim of cultural fairness. Sternberg (1984) states that the K-ABC has completely sacrificed validity in order to reduce black-white and other differences in results. In Kaufman's (1984) rebuttal, he states that Sternberg's criticisms seem to be based on personal prejudice rather than sound data analysis. The *Interpretive Manual* (Kaufman & Kaufman, 1983) is based on extensive statistical data collection and stands as an exemplification of thorough intelligence test manual writing (Kamphaus, 1990; Keith, 1985).

The manual includes sections dedicated to the discussion of reliability and validity, with 43 validity studies listed (Keith, 1985). Thus any criticism directed at the K-ABC should necessarily be based on equally extensive and sound research. Despite this, researchers cannot ignore such severe criticisms as Sternberg's, whether empirically justified or not. Criticism necessitates further investigation into predictive validity and bias in culturally different samples. Many studies have investigated the K-ABC for cultural bias within different populations. It is these studies which act as the prototype and impetus for the current study.

The K-ABC includes in its standardisation sample a large sample of Blacks (807) and a sample of Hispanics (157). In analysing the data obtained from this sample, as well as validity studies on minority races, Kaufman and Kaufman (1983) found that, while black/white differences in performance do exist on the Mental Processing scales, these discrepancies are about half the size of the differences found on the WISC-R Full Scale scores (Kaufman & Kaufman, 1983). Data for the K-ABC standardisation sample revealed a 7-point difference in favour of the white children on the Mental Processing Composite as opposed to the 16-point difference in favour of whites on Full Scale scores for children in the WISC-R standardization sample.

These results are disputed by Naglieri (1986) who, in a comparison of matched black and white children, found the magnitude of the differences between black and white children's scores on the WISC-R and K-ABC to be reduced. In his study he reported a 9-point difference between black-white performance on the WISC-R Full Scale, which was significantly less than the 16-point difference reported in Kaufman and Kaufman's study. A smaller, yet significant black-white difference of 6-points was evident on the K-ABC Mental Processing Composite. Naglieri's study does not therefore support Kaufman and Kaufman's statement that the K-ABC black-white difference is half that of the WISC-R. In addition, Naglieri's study showed that black children earned very similar WISC-R Full Scale and K-ABC Mental Processing Composite scores, suggesting that the K-ABC does not necessarily yield higher estimates of intellectual functioning than the WISC-R for black children.

Naglieri (1986) explains the differences in the two studies in terms of the methodological limitations of the K-ABC research in that the samples were not matched for socio-economic status thus misrepresenting degrees of difference. Disproportionate numbers of Blacks and Hispanics were sampled from upper socio-economic categories as compared with lower socio-economic categories, which served to lessen white/nonwhite differences. While this cannot be disputed, it is necessary to question whether tests which purport to measure intelligence should discriminate on the basis of socio-economic status. It is clear that non-discriminatory intelligence testing regardless of race, sex or socio-economic status is the ideal towards which test developers should be striving. Tests which discriminate on the basis of race, conceivably do not measure the actual construct of intelligence per se, reflecting confounding from external variables.

Kaufman and Kaufman (1983) have noted that blacks perform poorest on two K-ABC Achievement scale subtests, which are typically included in traditional intelligence test batteries, thus depressing black children's IQs on these measures. Naglieri (1986) confirms this finding in his investigation, where the black-white difference on the overall K-ABC Achievement scale reached significance. He also noted that there was a significant difference between the samples in favour of the whites on the acquired knowledge subtests of the WISC-R. This supports Kaufman and Kaufman's belief that non-intellective factors influence scores on conventional intelligence tests.

In general the literature does reveal evidence of smaller differences in scores for different cultural groups on the K-ABC as opposed to the WISC-R (Kaufman & Kaufman, 1983; Naglieri, 1984; Fourqurean, 1987; Flanagan, 1995).

Results reported by Naglieri (1984) in his study of 35 Navajo children, showed a significant difference between the mean WISC-R Full Scale scores and the K-ABC Mental Processing Composite, in favour of the latter suggesting that the K-ABC may be a better instrument of intellectual assessment in linguistically and culturally different children. Naglieri (1984) explains this discrepancy partially, as the influence of the English language on the WISC-R, but also due to the acqu' ed knowledge component on the Wechsler scale. The WISC-R was also found to correlate strongly with the criterion measure, the Peabody Individual

Achievement Test (PIAT), as well as the K-ABC Achievement scale, strongly supporting the assertion that there is a notable acquired knowledge component on the WISC-R.

Similar results are documented in Fourqurean's (1987) study of Latino learning-disabled children of limited English proficiency. WISC-R Full Scale scores were also found to be significantly lower than the K-ABC Mental Processing Composite. Fourqurean used these results to highlight the implications that this could have for Latino children, referred for assessment, who may be labeled mentally retarded as a function of the test that was administered. He also argued for the K-ABC as an improved measure of identifying learning disabilities, in that the students within his sample, all of whom had reading difficulties scored significantly lower on the K-ABC Sequential Scale which is said to be associated with reading disorders. This has some relevance to the current study which also focuses on a learning disabled population, although it is not within the scope of this study to address this issue directly.

Flanagan's (1995) research was also motivated by a desire to address the issue of conducting an unbiased assessment of children who are linguistically different, but her study focuses on children whose second language is English but who are proficient enough in English not to qualify for second language services. She found that the use of the K-ABC reflected higher cognitive ability than the use of the WISC-R in these children.

Flanagan (1995) documents the existence of linguistic bias in intelligence tests when assessing children whose second language is English but who are conversationally proficient in English. She argues that the evaluation of such children can be deceptive, as they no longer show overt signs that they are not first language English speakers, yet academic difficulties often persist. Many of the children in the current black sample may fit these criteria, in that exposure to English medium schooling may enhance their conversational English whilst not compensating for residual linguistic difficulties. On the basis of Flanagan's results the black sample in the current study are expected to perform better on the K-ABC than the Wechsler scales.

Despite strong evidence for the support of the smaller black-white differences on the K-ABC (Kaufman & Kaufman, 1983; Naglieri, 1984; Fourqurean, 1987; Flanagan, 1995), Jensen (1984) has argued that smaller black-white differences are a function of the arbitrary weightings of the subtests to arrive at total scores. Mental Processing Composites comprise of the sum of three tests of sequential processing and five tests of simultaneous processing. This 3 to 5 ratio is criticised for the lack of theoretical basis for these weights. Jensen also points out that since there are black-white differences on the various subtests, the size of the group differences on the total score will depend on how the subtests are weighted. He demonstrates how a similar effect is possible on the WISC-R, in that the black-white difference on the WISC-R would be lowered if subtests were weighted differently. It should, however, be noted that Jensen has been shown to have used misleading data to make his point (c.f. Kaufman, 1984) which calls into question the validity of this hypothesis. Kaufman (1984) also points out that while Jensen has the right to criticise the K-ABC's failure to articulate a rationale for the weighting of subtests, his contention that the weighting structure of the tests contributes to the lessening of the black-white difference is without justification. Since the Simultaneous subscale contributes more heavily than the Sequential subscale to the Mental Processing Composite, this actually serves to elevate black-white differences as the Simultaneous Processing subscale was shown to produce a larger discrepancy in favour of whites, than did the Sequential Processing subscale.

In a step towards evaluating item bias within the K-ABC, Willson, Nolan and Reynolds (1989) examined race and gender differences on the item functioning. The impetus for this study was the need to examine the K-ABC at an item level due to the use of individual subtest scores in cognitive profiles. Despite evidence for item bias on certain individual items for different groups, the overall effects of these biases on the total score differences between the groups were found to be inconsequential. This evidence was replicated in Nolan, Watlington and Willson's study (1989) of gifted and nongifted children, once again utilising race and gender as variables. No systematic pattern of bias was found, suggesting that the K-ABC provides a useful estimate of intelligence regardless of racial or gender factors.

Valencia and Rankin (1986, cited in Valencia & Rankin, 1988) examined the K-ABC for bias in construct validity. They found, through the use of factor analysis, that there was factorial similarity for two ethnic groups across four factors, indicating an absence of bias in construct validity.

Valencia and Rankin (1988) did however find evidence for bias in the predictive validity on the K-ABC in samples of Anglo and Mexican American children. Using the Comprehensive Tests of Basic Skills (CTBS; Language, Reading, Mathematics, and Total Scores) as the criterion variable, they found considerable evidence for differential predictive validity, in that the K-ABC did not predict CTBS scores with the Mexican-American group as accurately as with the Anglo group. They suggested that the problem may be in the CTBS, the criterion test, as it may in itself be biased. Since the difference in scores obtained on the Mental Processing Composite of the K-ABC were minimal between the Mexican American and Anglo groups, the scale appeared to be operating at the same difficulty range. Thus the K-ABC in itself did not appear to be biased against a particular group. The researchers thus concluded that "unbiased tests do not predict true variance in a criterion test when the criterion itself may be biased" (Valencia & Rankin, 1988; p.262).

In similar studies the predictive validity of both the WISC-R and the K-ABC has been criticized, as both were found to overestimate the academic performance of the Black and Hispanic groups compared to their actual achievement test scores on various measures (Palmer, Olivarez, Willson & Fordyce, 1989; Olivarez, Palmer & Guillemard, 1992). Since such results regarding predictive validity may have significant implications for the utility of the K-ABC, it becomes necessary to question to what extent bias is located within the intelligence measure and to what extent it is located within the criterion measure, therefore affecting the overall predictive validity of the intelligence measure.

While it is not within the scope of the present study to assess criterion measure bias, certain studies have highlighted these issues. Clarizio and Bennett (1987) found evidence of discrepancies in the identification of different students based on the use of different criterion measures. They attempted to evaluate whether the discrepancy between the K-ABC Mental Composite and Achievement Scale corresponded with the discrepancies found

between the WISC-R and the Peabody Individual Achievement Test (PIAT), thus identifying the same population of students. The WISC-R/PIAT combination consistently identified different students than did the K-ABC Mental Processing Composite/Achievement combination. This has serious implications for children referred for possible learning difficulties, highlighting the need for well researched, reliable criterion measures. Since the evaluation of the predictive validity of intelligence tests is largely dependent on accurate criterion measures, the advancement of intelligence testing research in South Africa is contingent upon reliable, unbiased measures of intelligence as well as academic achievement.

Bracken (1985) pointed out that, despite extensive research, no long range black-white predictive validity studies had been published at the time of his review of the K-ABC. The current literature review reveals a similar dearth of research in this area to date. Bracken argues that traditional IQ tests have proved to be good predictors of future performance in both black and white groups. He contends that if the K-ABC is to be commended as a non-biased instrument, then it should also predict future performance accurately for both whites and nonwhites. Bracken states that it is likely that the K-ABC has reduced its black/white mean score difference at the expense of its predictive validity. Certainly some of the studies cited above do suggest that the K-ABC does overpredict concurrent academic performance, which is in part a confirmation of Bracken's concerns. Despite this, researchers need to consider the underlying purposes and assumptions of intelligence testing. Based on Kaufman and Kaufman's assumption that intelligence is the problem solving and cognitive processing ability of an individual, as apposed to acquired knowledge, then it is conceivable that a disadvantaged individual may in fact score higher on a measure of cognitive ability than might be expected from his/her academic achievement. That is to say, an individual may have the potential to achieve, but not the opportunities to achieve. Current levels of achievement may be a reflection of lowered educational opportunities and not lowered intelligence. Traditional intelligence tests, while certainly predicting both current and future performance under less than optimal conditions, do not reflect potential when given the appropriate remediation and opportunities.

While the current researcher agrees with Bracken's call for further research into the long term predictive validity of the K-ABC, it is noted that such research should only occur in a context where appropriate opportunities for academic success and intervention are offered. It is only in this way that researchers can measure the extent to which the K-ABC is an accurate measure of potential for learning which is ultimately a more neutral definition for intelligence. As stated earlier, assessment is, after all, a political activity which serves to perpetuate beliefs about the cultural hierarchies and superiority (Kriegler & Skuy; 1996). Research that is not aimed at helping pupils learn, but rather confirming beliefs of intellectual inferiority of disadvantaged groups, is a useless and unethical exercise.

It should also be noted that there has been some debate as to what should constitute academic achievement and the criteria used to predict academic success. In line with the shift from an acquired learning model towards cognitive functioning model of assessment philosophy, there appears to be a gradual shift in philosophy about what constitutes an appropriate education for life. Classical curricula in the old mode of rote learning have been criticized due to their focus on acquiring a knowledge base without teaching cognitive skills and strategies that can be transferred (Skuy, 1995). The choice of future curricula should depend on the relative effectiveness of different curricula in equipping people for life. This will play a crucial role in the future development of intelligence and achievement measures.

3) THE STUDY

3.1) Rationale and Aims

As discussed in a review of the literature, the assessment of a child's intellectual level is an important part of an overall evaluation of the child's general potential for learning and the determination of possible educational alternatives. The predictive validity of instruments used to assess intelligence is essential, as intelligence scores often form the basis for classification and placement. Previous studies have indicated bias in the results of intelligence tests in different cultural contexts. The extent to which newer instruments of intelligence such as the Kaufman Assessment Battery for Children can provide unbiased, valid estimates of intelligence within diverse cultural groups in South Africa is therefore relevant.

Numerous studies about the K-ABC have been published attesting to the interest and attention that this testing approach and test have evoked. Despite this, it is noteworthy that no research has been undertaken within the South African context, considering the great dissatisfaction with current measures of assessment for historically disadvantaged South African communities. It is this area that this research hopes to partially address.

Intelligence testing research reveals some evidence of the utility of the K-ABC as a measure of intelligence in diverse populations (Flanagan, 1995; Fourqurean, 1987; Kaufman & Kaufman, 1983; Naglieri, 1984, 1986; Valencia & Rankin, 1986; Willson, Nolan & Reynolds, 1989; Nolan, Watlington & Willson, 1989). Severe criticisms against the K-ABC are also noteworthy (Bracken, 1985; Das, 1984; Das, Mensink & Janzen, 1990; Jensen, 1984; Naglieri & Jensen, 1987; Naglieri & Das, 1990). Despite this, viable alternatives have been few. The considerable lack of research into alternative methods of intelligence testing within South African populations and the dire need for unbiased measures of intelligence in this country, acts as the impetus for the current study. While this study cannot hope to provide definitive evidence for the utility of the K-ABC in South African populations, it hopes to extend the field for further investigations into more viable and equitable means of intellectual assessment.

Taking cognisance of the theoretical issues, as well as the findings of previous research, it is hypothesized that:

1. White South African children will perform better on the WISC-R/WISC-III than black South African children.
2. The white children will perform better on the Verbal Scale and the acquired knowledge subtests of the WISC-R/WISC-III.
3. There will be no difference between the black and white samples on the K-ABC.
4. There will be a significant difference between scores on the WISC-R/WISC-III and the K-ABC *within* the black sample.
5. a) The range of teachers' qualitative ratings of the black and white pupils on an impressionistic view will not differ.
   b) Teachers' qualitative ratings will be more closely related to the K-ABC than to the WISC-R/WISC-III IQ scores.

3.2) Method

3.2.1) Subjects

The sample consisted of 55 children at two private remedial schools (43 males, 12 females). The majority of subjects came from Crossroads School, with 4 black subjects from Japari School, in order to increase numbers within the black sample. Both Crossroads and Japari are non-racial remedial schools in Johannesburg which serve mainly upper and middle class communities. The schools are designed to cater for learning disab d children who cannot make progress at a regular primary school. Pupils are accepted into the schools on the basis of a comprehensive multidisciplinary assessment, generally administered at the school, leading to the diagnosis of a classic learning disability. Since such a diagnosis assumes that pupils are at least of average intelligence, multiple measures of intelligence are sometimes used to establish this criterion. The current sample was selected according to the availability of both WISC-R /WISC-III and K-ABC data since both tests had not been administered to all pupils at the schools.

Males accounted for more than twice the subjects than did females, which is consistent with other studies of learning disabled pupils (Clarizio and Bennett, 1987). There were 21 black children and 34 white children. The under representation of black students is related to the small number of black students within private schools. Background information about the subjects was gathered from school records, which were not always comprehensive. Data within the pupil's personal files was sometimes incomplete. However, due to the small sample size, subjects were excluded from the study only where test scores were not available. The age at which each pupil was tested were not documented for every pupil. The mean age for the black sample was 7.9 at the time of testing on the WISC-R/WISC-III (based on ages documented for 16 sample members) and 9.5 at the time of testing on the K-ABC (based on ages available for whole sample). The mean age for the white sample was 7.7 at the time of testing on the WISC-R/WISC-III (based on ages documented for 29 sample members) and 8.4 at the time of testing on the K-ABC (based on ages available for 33 sample members).

Parents' occupations were used as indicators of socio-economic status (if both parents were employed the mean score was calculated). Their occupation levels were rated on a scale developed by Warner et. al. (1960) and revised by Morris (1985). This scale (see Appendix 2) consists of four categories: (1) professional; (2) lesser professional; (3) clerical skilled and (4) generally/manually skilled. A fifth category- not employed- includes parents who are looking for work, home-executives or parents who are absent either through separation or death. The mean occupational level for the white sample was 2.4 (SD = 0.7) and for the black sample was 2.2 (SD = 0.8). The mode for both groups also fell within the second occupational level (i.e. lesser professional) (range = 1-4), indicating that parental occupation levels for the black and white samples were similar.

3.2.2) Procedure

Permission to examine pupil's personal school files was granted by the school's principal and clinical coordinator, on the condition that the confidentiality of data was ensured.

WISC-R/WISC-III and K-ABC scores were thus obtained from school records. Post hoc data were subsequently entered into a data base and analyzed statistically.

Subjects had been required to complete the Wechsler Intelligence Scales for Children - Revised (WISC-R) or the Wechsler Intelligence Scales for Children - Third Edition (WISC-III) which were administered by clinical and educational psychologists, as part of a general psychoeducational assessment battery administered at their respective schools. The WISC-R/WISC-III formed part of a diagnostic battery which was used to classify and diagnose pupils for appropriate remediation. These tests were administered over a period of time, with the children who were tested more recently being tested on the WISC-III as apposed to the WISC-R which is an older edition of the test.

More recently, the Kaufman Assessment Battery for Children (K-ABC) Mental Processing Composite was also administered to the pupils, once again by appropriately trained clinical and educational psychologists, in order to refine diagnostic data to improve treatment programs. This was part of an endeavor to find more useful and valid assessment methods for South African children than traditional psychometric measures (such as the WISC-R/WISC-III) appeared to be.

For the purpose of this study, teachers at the schools were asked to rate the pupils within the sample according to what they believed each pupil's intellectual potential to be, in spite of poor marks or low intelligence quotients (See Appendix 3).

3.2.3) Measures

The Wechsler Intelligence Scales for Children (WISC-R/WISC-III) (Wechsler, 1974, 1991) are individually administered tests of intelligence which are empirically derived and extensively researched measures of intellectual ability for children aged from 6 years to 16 years, 11 months. The Full Scale intelligence quotient (IQ) is a combination of the Verbal and Performance Scale IQ scores. The normative mean for each scale is 100 with a standard deviation of 15.

Reliability coefficients for both the WISC-R and the WISC-III Full Scale IQ are high, (r = .96 for both measures). Numerous validity studies are cited in the WISC-III manual for both the WISC-R and the WISC-III. Wechsler (1991) describes the WISC-R as "one of the most widely researched psychological tests and one of the most extensively cited tests in the professional literature." (p. 71) Construct, criterion and predictive validity are therefore explored in the manual based on a review of extensive research (c.f. Wechsler, 1991). Wechsler (1991) combines the validity research for the two measures based on the substantial correlations between the revised and third editions. Additional information of the WISC-R/WISC-III is available from Kaufman (1979) and Kaufman (1994).

The Wechsler Intelligence Scale for Children - Revised and the Wechsler Intelligence Scale for Children - Third Edition were used interchangeably in this study. Children were tested on the older and newer editions, subject to the availability of the test materials. The Wechsler Intelligence Scale for Children - Third Edition was used in preference to the previous edition, when available. While the lack of a consistent measure is recognized as a limitation, the researcher was unable to control for this factor due to the post hoc nature of the research.

Thus for the purpose of this study the Wechsler scales are viewed as essentially equivalent measures of intelligence, as both editions maintain the same basic structure and content as well as the same theoretical foundations, in that they are both said to measure a general factor of intelligence or "g" (Wechsler, 1991). Although some improvements have been made to the new edition (WISC-III) and a number of new items have been added, the major features of the WISC-R have remained the same. Wechsler (1991) notes that 73% of the WISC-R items were retained in original or slightly modified form. Despite this, it is necessary to document some of the changes made and review the comparative research to establish credibility for the interchangeable use of the two measures in this study (See Appendix 4).

The Kaufman Assessment Battery for Children (K-ABC) (Kaufman, 1983) is a measure of cognitive ability based on information-processing theories. It is an individually administered

test of ability and achievement for children of 2 1/2 to 12 1/2 years. The whole test comprises 16 subtests divided into a Mental Processing Scale and an Achievement Scale.

The Achievement Scale is proposed as a measure of acquired knowledge or crystallized intelligence as apposed to the Mental Processing Composite which is believed to measure fluid intelligence (Flanagan, 1995; Kamphaus, 1990; Taylor, 1985). Only the Mental Processing Composite was administered for the purposes of this study since these subtests determine intellectual functioning on the K-ABC. Exclusion of the Achievement scale was justified in terms of research findings which show considerable evidence for content bias on the K-ABC Achievement scale against a minority group sample (Valencia & Rankin, 1985, cited in Valencia & Rankin, 1988). The Mental Processing Composite is a combination of the Simultaneous and a Sequential Scale scores. The Mental Processing scales (Simultaneous, Sequential, and Mental Processing Composite) have a normative mean of 100 and a Standard Deviation of 15.

Reliability coefficients for the Mental Processing Composite of the K-ABC exceed .90 for both the preschool and school-age levels. The validity of the K-ABC is explored in the manual based on 40 separate validity studies and are synthesized to offer evidence of construct, predictive and concurrent validity (c.f. Kaufman, 1983). A general review of the literature reveals a growing body of research focused on the K-ABC, giving it increasing credibility and popularity as an assessment tool. The extent of is current usage in clinical settings is, however, unclear.

The criterion variable in the present study was teachers' ratings of children's intellectual potential. Teachers were required to rate pupils' intellectual potential on a scale which ranged from Exceptionally Low (69 and below) to Exceptionally High (129 and above) according to what they impressionistically believed each pupil's potential to be, regardless of their current scholastic performance (See Appendix 3). Teachers ratings were "blind" in that they did not know the actual IQ status of each pupil or the purposes of the study. Teachers were asked to rate potential as opposed to current intellectual functioning in order to gain a qualitative index of what they believed was the inherent ability or "fluid intelligence" of each pupil.

These ratings were limited in that their reliability and validity were not established although they were used qualitatively in the current study to gain a tentative impression of how teacher's perceptions compared with the pupil's actual intelligence scores on the two research measures. This was used as a provisional indication of external validity.

3.2.4) Design

Standard scores were used in all analyses. In order to determine whether there were significant differences between the samples, the Wilcoxon rank-sum test was used, as opposed to a simple t-test, due to the non-parametric nature of the data. Comparisons within the samples were made using a univariate signed-rank procedure. The following comparisons were statistically analyzed according to the above procedures:

- The WISC-R and WISC-III Full Scale scores were compared to determine whether these data should be treated together or separately.
- The mean Full Scale scores on the WISC-R/WISC-III of the black and white subjects were compared.
- The mean Verbal and Performance Scale scores respectively, of the black and white subjects, on the WISC-R/WISC-III were compared.
- The mean scores of the black and white subjects on the acquired learning subtests (Vocabulary, Information and Arithmetic) of the WISC-R/WISC-III were compared.
- The mean Mental Processing Composite scores of the black and white subjects on the K-ABC were compared.
- The mean WISC-R/WISC-III Full Scale and K-ABC Mental Processing Composite scores of the black and white subjects were compared.

Teachers' ratings were evaluated qualitatively. The range of ratings for black and white pupils were compared graphically to assess whether there were notable differences in teachers' ratings between the groups. Their ratings of pupils' intellectual potential were also compared to actual scores on the WISC-R/WISC-III and K-ABC for the black and white

subjects, in order to gain a tentative gauge of which test provides a more accurate assessment of intelligence. Statistical analyses could not be performed on these results due to the limitations of this criterion measure.

4) RESULTS

Before testing the hypotheses, the legitimacy was established of using the WISC-R and the WISC-III interchangeably, and grouping them as equivalent measures for the current sample. Table 1 presents the means and standard deviations for the WISC-R and WISC-III Full Scale scores for both the black and white subjects of the sample.

Table 1

The Means and Standard Deviations for the WISC-R and WISC-III Full Scale Scores for Black and White Subjects

	White (n=34)		Black (n=21)	
	M	*SD*	*M*	*SD*
WISC-R	95.9	8.1	82.2	7.5
WISC-III	93.0	12.4	88.1	5.8

Using the Wilcoxon rank-sum test, it was found that differences in scores on the WISC-R and WISC-III were negligible and non-significant irrespective of race group ($p>.05$). Thus the current study did not distinguish between the two tests when performing further statistical analyses, combining WISC-R and WISC-III results (WISC).

Hypothesis 1: The white children will perform better on the WISC-R/WISC-III than the black children.

Table 2 shows the means and standard deviations and levels of statistical difference for WISC Full Scale scores for the black and white subjects.

Table 2

Comparison of Mean WISC Full Scale Scores for the Black and White Samples

	White (n=34)		Black (n=21)		
	M	*SD*	*M*	*SD*	*p*
WISC FS	94.0	11.1	84.2	7.4	0.0021**

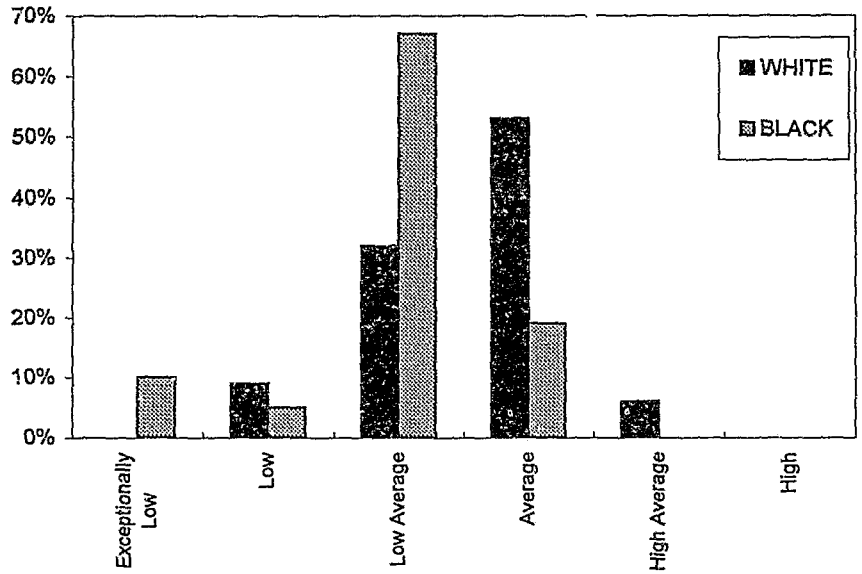
As can be seen from Table 2, when combined WISC (WISC-R/WISC-III) Full Scale scores were compared, *z*-values showed a significant difference between the white and black samples ($p<0.01$). As predicted, white pupils were shown to perform better than black pupils on the Wechsler Scales, revealing a 9.8 point difference between mean scores. The mean scores for white pupils were found to fall within the Average range, with mean scores for black pupils falling within the Low Average range. Thus, according to these results the black sample was classified as intellectually inferior to the white sample.

Hypothesis 1 was therefore confirmed.

The ranges of the black and white children's performance on the WISC is presented in Figure 1.

Figure 1

Black and White Children's Intellectual Functioning on the WISC.



When the results of the two groups are presented graphically, the magnitude of the differences in IQ scores between the two groups is emphasized. The distribution of scores for the black children is clearly skewed towards the lower ranges of the scale.

<u>Hypothesis 2: The white children will perform better on the Verbal Scale and the acquired knowledge subtests of the WISC-R/WISC-III.</u>

In order to further clarify the differences between the two samples on the Wechsler Scales, a comparison was made between the composite WISC Verbal and Performance Subscales. These results are presented in Table 3.

Table 3

Comparison of Mean Scores on the WISC Verbal and Performance Subscales for Black and White Samples

	White (n=34)		Black (n=21)		
WISC	*M*	*SD*	*M*	*SD*	*p*
Verbal	97.3	14.4	85.0	10.9	.003*
Performance	92.2	13.8	86.0	10.3	.1337

As evident from the above table, scores for the WISC Verbal Subscale were significantly lower for the black sample ($p<.01$), while differences between scores on the Performance Scale did not reach significance. This indicates that intergroup differences in Full Scale scores are largely contingent upon scores on the Verbal Scale. Further analysis of the acquired learning cluster on the Wechsler Scales (Information, Arithmetic and Vocabulary) also revealed that the subtests with the greatest amount of verbal involvement produced the greatest amount of variability. The difference between information scores between the groups was found to be significant ($z = -3.2$; $p<0.005$) as was the difference between Vocabulary scores ($z = -2.0$; $p<0.05$). Differences between groups on Arithmetic scores did not, however, reach significance ($p>0.5$).

Hypothesis 2 was therefore partially supported.

<u>Hypothesis 3: There will be no difference between the black and white samples on the K-ABC.</u>

The means and standard deviations for the K-ABC Mental Processing Composite for the black and white samples as well as levels of statistical difference are presented in Table 4.

Table 4

Comparison of Means for the K-ABC Mental Processing Composite for Black and White Samples

	White (n=34)		Black (n=21)		
	M	*SD*	*M*	*SD*	*p*
K-ABC MPC	97.4	9.5	102.9	10.1	0.07

The mean differences between the two samples in intellectual ability as measured by the K-ABC MPC was not significant ($p>0.05$). Both groups were also functioning near the K-ABC standardization mean of 100. Thus, according to the results of the K-ABC, the black and white samples were functioning within equivalent ranges of intelligence.

Hypothesis 3 was therefore confirmed.

These results are presented graphically in Figure 2.

Figure 2

Black and White Children's Intellectual Functioning on the K-ABC.

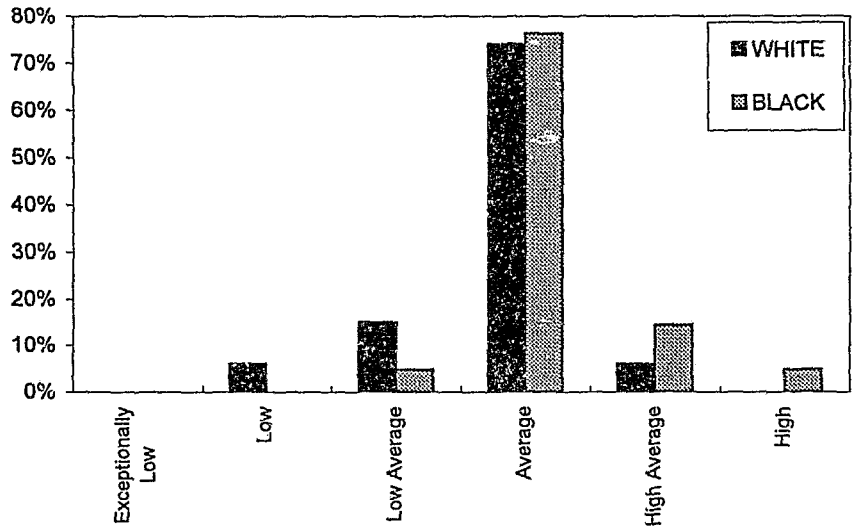


Figure 2 indicates that the K-ABC scores placed an equivalent proportion of black and white children within the Average range. It is noteworthy that, of the children that did not score in the Average range, a larger proportion of black children were placed within the higher ranges of intelligence than white children, whereas a larger proportion of white children were placed within the lower ranges than black children.

Hypothesis 4: There will be a significant difference between scores on the WISC-R/WISC-III and the K-ABC *within* the black sample.

Owing to the differences between intellectual estimates on the Wechsler Scales and the K-ABC for the black sample, and in line with the hypotheses, a comparison was made between the mean WISC Full Scale scores and the K-ABC Mental Processing Composite within the samples using a univariate signed-rank procedure. The results of these analyses are presented in Table 5.

Table 5

Comparison of Mean Scores on the Wechsler Scales and the K-ABC within black and white samples

	WISC		K-ABC			
	M	*SD*	*M*	*SD*	*t*	*p*
Black	84.2	7.4	102.9	10.1	6.9	0.0001***
White	94.0	11.1	97.4	9.5	1.7	0.1639

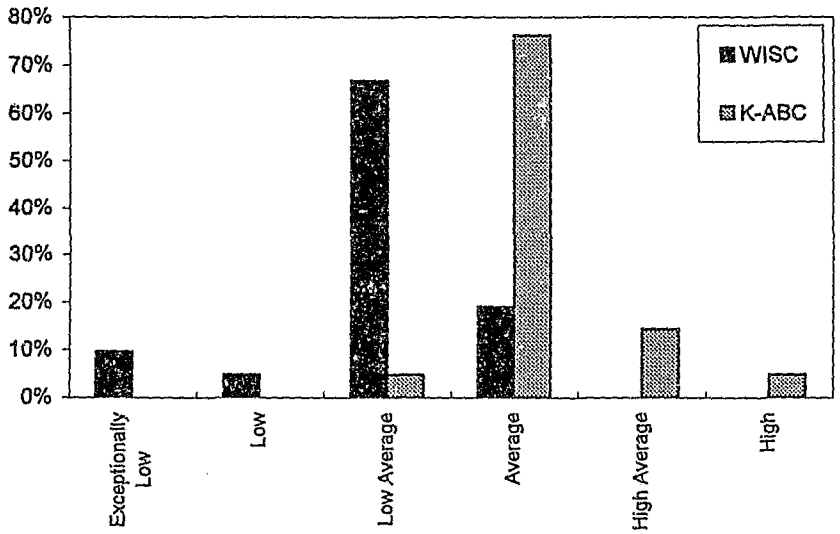
As can be seen from Table 5, the difference between the WISC Full Scale and the K-ABC Mental Processing Composite within the black sample was found to be highly significant (t = 6.9; p = 0.0001). This indicates that these measures do not yield equal estimates of intellectual functioning for black learning disabled children.

Hypothesis 4 is therefore confirmed. The difference between WISC and K-ABC scores was not significant for the white sample.

The distribution of scores for each group on the measures are presented in Figures 3 and 4. Due to the sample size and the inadequate representation in all the cells, especially within the extreme echelons of the scale, statistical analyses of the distribution could not be performed.

Figure 3

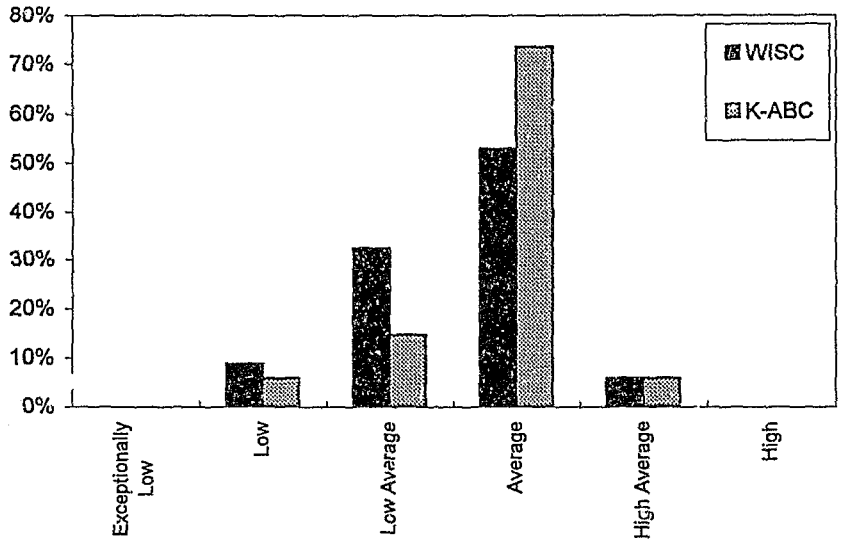
Black Children's Intellectual functioning on the WISC and K-ABC.



From an impressionistic viewpoint, it is clear that the K-ABC provides much higher estimates of intelligence for the black group than the WISC. 76% of the black children were placed within the Average to High range using the K-ABC as opposed to 19% when using the WISC. WISC scores placed the majority of black pupils in the Low Average range (67%), while the K-ABC placed the majority in the Average range. Using the WISC, the range of intelligence scores for the black subjects was from Exceptionally Low to Average, while the range for the same group, using the K-ABC was Low Average to High.

Figure 4

White Children's Intellectual Functioning on the WISC and K-ABC.



Within the white sample there was also an increase of pupils placed within the Average range using the K-ABC (74%) rather than the WISC (53%). It is also noteworthy that the K-ABC reduced the representation of white pupils within the lower ranges of the scale, yet the relative distributions remained the same. That is, the Average accounted for the majority, irrespective of the test used, and there were relatively few subjects in the lower and higher extremes (normal distribution).

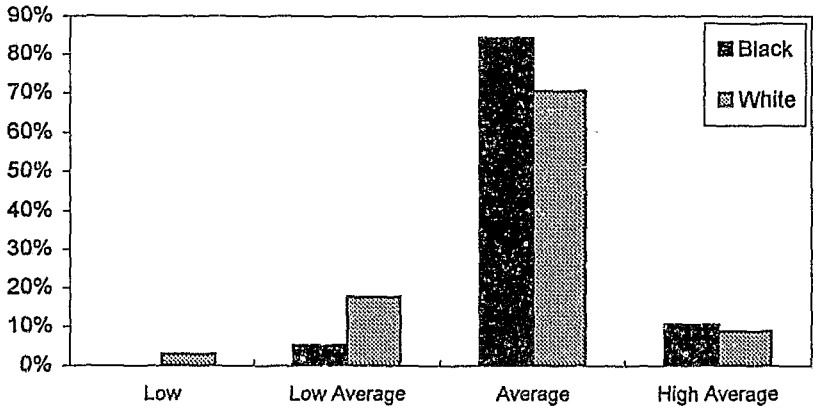
When compared with the distributions for the black subjects, the overrepresentation of subjects in lower extremes of the scale using the WISC is made clear. For the black subjects the distribution of scores for the WISC were skewed towards the lower end of the scale, while the distribution of K-ABC scores appeared to be more "normal." This suggests the lack of validity of the WISC for the black subjects, and the greater validity of the K-ABC.

Hypothesis 5 a): The range of teachers' qualitative ratings of the black and white pupils on an impressionistic view will not differ

Results certainly attest to the fact that the K-ABC provides higher estimates of intelligence within disadvantaged groups, but the external validity of these results can only be ascertained through a criterion measure. While the reliability and validity of the teachers' ratings are in question, they provide a valuable external qualitative impression of pupils' intellectual potential. Teachers' ratings of black and white pupils are presented in Figure 5.

Figure 5

Teachers' Ratings of Intellectual Potential



Teachers' ratings placed a higher percentage of white pupils within the lower ranges of intellectual potential than black pupils. A lower percentage of white than black pupils were estimated to fall within the Average and High Average ranges of intelligence. Thus hypothesis 5 a) was only partially supported in that teachers' ratings placed the majority of both black and white pupils in the Average range. Differences in teachers' ratings seemed to relate to the learning disabled nature of the current sample. While the white pupils in the sample probably meet the criteria for a classic specific learning disability, black pupils are more likely to be classified as learning disabled due to a lack of adequate educational opportunities. Thus teachers' ratings of potential ("fluid intelligence") are reflective of their estimates of the children's underlying ability if given adequate opportunities to achieve.

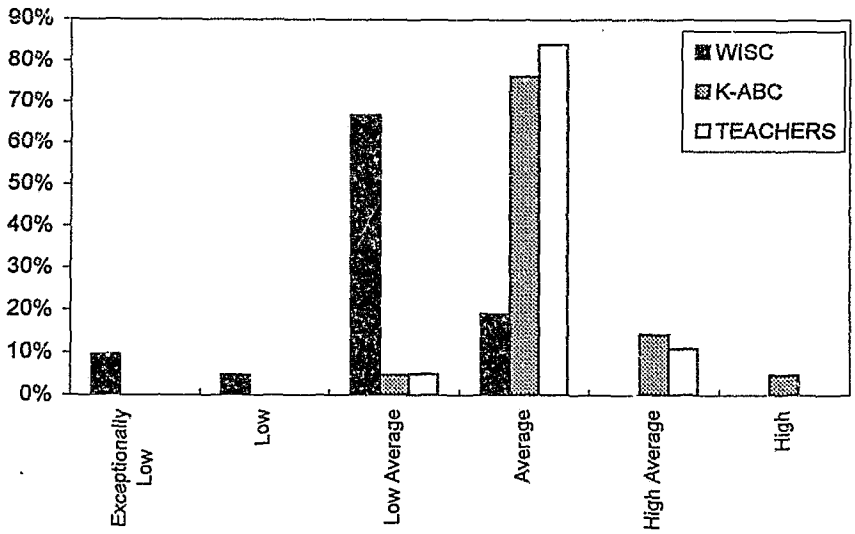
Discrepancies in ratings may therefore be reflective of the discrepancies in previous educational opportunities of the black and white subjects.

Hypothesis 5 b): Teachers' qualitative ratings will be more closely related to the K-ABC than to the WISC-R/WISC-III IQ scores.

When teachers' ratings were compared to WISC and K-ABC scores they seemed to relate more favourably with K-ABC scores than WISC scores. These results are presented graphically in Figures 6 and 7.

Figure 6

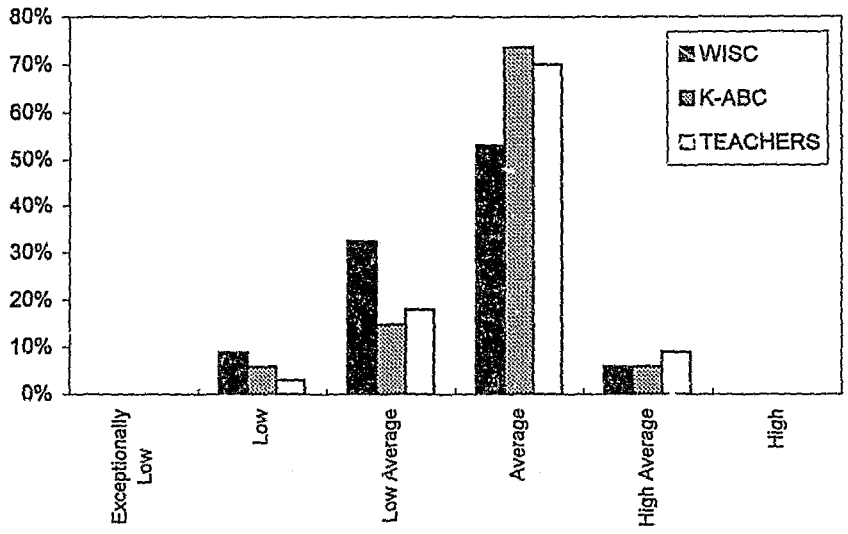
Teachers' Ratings of Intellectual Potential compared to Black Children's Intellectual Functioning on the WISC and K-ABC.



Teachers' ratings of the black pupils followed the distribution of K-ABC scores as opposed WISC scores. 84% of black pupils were rated as having average intellectual potential which corresponded closely to the 76% placed in the Average range on the K-ABC, as opposed to 19% placed in the Average range by the WISC.

Figure 7

Teachers' Ratings of Intellectual Potential Compared to White Children's Intellectual Functioning on the WISC and K-ABC.



Teachers' ratings of white pupils also seemed to correspond more closely with K-ABC scores than WISC scores. 70% of the white children were rated as having average potential which closely corresponded with the 74% falling within the Average range when using the K-ABC. When compared to the teachers' ratings the WISC seemed to overestimate the proportion of white pupils falling within the lower ranges of intelligence, with 32% falling within the Low Average range as compared to 18% based on teachers' ratings.

Hypothesis 5 b) was therefore supported.

Despite this striking evidence, only tentative conclusions can be drawn from these results. Due to the inadequacies of the criterion measure, a statistical correlation could not be performed.

5) DISCUSSION

5.1) Interpretation of Results

As suggested from the literature (Flanagan, 1995; Fourqurean, 1987; Naglieri, 1984) and in the accordance with hypotheses, the results indicated that the Wechsler Scales provided significantly lower measures of intelligence for the black sample than the white sample. There was a 9.8-point difference in black/white performance on the WISC Full Scale which corresponds closely with the 9-point difference found by Naglieri (1986) in his comparison between a matched sample of black and white children. It is, however, speculated that the black/white difference within the general South African population may in fact be larger and closer to the 16-point difference found by Kaufman and Kaufman (1983). Since the current study focused on a relatively privileged black and white sample, results may be somewhat distorted, as this sample is not representative of the socio-economic disparity between black and white within the general South African population. The learning disabled nature of the sample, more particularly the whites, may also serve to further confound results. Additional evidence is therefore needed to confirm the extent to which the groups differ on the WISC. However, the current results provides an indication that there is probably a difference between the performance of black and white South African children on the WISC.

The difference between the scores on the K-ABC Mental Processing Composite did not, however, discriminate on the basis of race, which would indicate that this scale is operating in the same difficulty range for each group. Further, the fact that the K-ABC Mental Processing Composite was significantly higher than the WISC Full Scale for the black sample, suggests that the two tests do not provide equal measurements of intelligence for black children. It would appear, in line with previous research (Flanagan, 1995; Fourqurean, 1987; Naglieri, 1984; Nolan, Watlington & Willson, 1989) that the K-ABC may provide a more equitable measure of intelligence in culturally, linguistically disadvantaged communities.

A qualitative analysis of the distribution of scores for both measures (see Figures 3 and 4) revealed that the K-ABC provided higher indexes of intelligence for both the black and white sample, placing larger proportions of them within the higher ranges of the IQ scale than the WISC. While this was expected within the black sample, it is notable that the classification of many white children was also dependent on the measure used. Since there is evidence that the ability test scores of children who are poor readers declines over time, especially on verbal measures (Kline, 1996), the learning disabled status of the white sample may have negatively effected their scores on the WISC. As the K-ABC excludes verbal reasoning tasks from its Mental Processing Composite, the IQ scores of many of the white children improved on this measure, although this improvement did not reach significance.

Because the black children in the sample scored significantly lower on the WISC Verbal Scale compared with their white counterparts, as well as on the subtests more closely linked to learning, it is likely that acquired knowledge and language factors explain differences in WISC IQ scores rather than actual differences in intelligence. This concurs with Kaufman and Kaufman's (1983) finding that the Verbal IQ of exceptional samples (learning disabled and culturally disadvantaged groups) are limited due to second-language issues and school-related difficulties. The strong reliance on the English language in the Wechsler scales and the fact that the K-ABC is largely non-verbal is probably the primary factor contributing to the K-ABC/WISC discrepancy.

Since factor analyses have shown the WISC-R verbal comprehension subtests and the Arithmetic subtest to load on the same factor as the K-ABC Achievement subtests (Naglieri & Das, 1990; Kaufman and Mclean, 1987; Naglieri & Jensen, 1987) it is reasonable to assume that the lowered results of the black sample on the Verbal Scale are due to the acquired knowledge components of this scale. Further examination of the results confirmed the above supposition, revealing that the primary difference of results within the WISC Verbal Scale occurred within the acquired knowledge cluster of subtests (Bannatyne, 1971, 1974, cited in Kaufman, 1994). More specifically, the white sample performed significantly better on the Information and Vocabulary subtests which form part of the acquired learning cluster and contain a predominantly verbal base.

Interestingly there was no difference between groups on the Arithmetic subtest which also forms part of this cluster. This may be due to the lessened language component of this subtest. Indeed, according to Flanagan (1995, cited earlier) linguistic bias in intelligence tests such as the WISC-R may lower scores of children whose second language is English despite conversational proficiency in English. Thus, within the current black sample, exposure to private English medium schooling may have provided them with the ability to acquire sufficient knowledge in areas such as arithmetic, but not allow them to compensate for residual second language difficulties in verbally dependent areas.

Since the results of this study confirm the hypotheses, offering some support for the use of the K-ABC with black South African children, the question remains as to the predictive validity of the K-ABC. In view of the fact that one of the shortcomings of the current study is the lack of a validated criterion measure, only tentative conclusions can be drawn. Teachers' qualitative ratings of pupils intelligence do, however, provide some evidence as to the legitimacy of the K-ABC as an alternative measure of intelligence. Based externally on an impressionistic view, it is noteworthy that the range of teachers' ratings differed only slightly for the two groups. Interestingly, teachers tended to rate the black sample more favourably than the white sample, placing fewer black children in the below average ranges (see figure 5). In general, however, teachers rated the majority of black and white students as having Average intellectual potential ("fluid intelligence") which is certainly reflected in their K-ABC MPC results.

When analyzed graphically (See Figures 6 and 7) it is clear that teacher's ratings tended to correspond more closely with pupils' scores on the K-ABC than the WISC, especially for the Black pupils. This is further evident when pupils' scores are compared to teachers' ratings on an individual basis. For the two black pupils that teachers rated as having high average intelligence, their K-ABC scores were within the High Average range, despite their Low Average scores on the WISC. In this instance the WISC certainly appeared to underestimate ability. Similarly, the only black pupil who scored within the Low Average range on the K-ABC was identified by his teacher as having lower than average intellectual potential. This provides provisional evidence that the K-ABC is a more accurate and

equitable measure of intelligence, as apposed to the Wechsler scales which seem to reflect an overly negative view of functioning for black South African children.

The ratings for white pupils where more difficult to analyze on an individual basis, in that the pattern of correlation appeared to be more haphazard. Teachers' ratings of individuals sometimes related more closely to K-ABC scores than WISC scores and visa versa. As a whole, however, when white pupils' scores were analyzed together (See Figure 7), teachers' ratings certainly seemed to predict K-ABC scores more consistently than WISC scores. Due to individual discrepancies and the lack of statistical corroboration, it was, however, difficult to assess with certainty, which of the measures provided a more accurate estimate of intelligence in a group of children that have had the opportunity to acquire the skills assessed in traditional measures of intelligence. A detailed correlational analysis was not possible in the current study due to the inadequacy of the criterion measure, although this is an area requiring further research.

Overall, the results did provide some support for the utility of the K-ABC as an alternative non-discriminatory measure of assessment, especially for black South African children.

5.2) General Implications of the Findings

Should the findings of the current study be corroborated by future research, the implications for both assessment and education in South Africa may be far reaching. Firstly, the current adherence to traditional methods of assessment may be seriously questioned, with reference to a nondiscriminatory alternative. While there has been the recognition that conventional intelligence tests tend to misclassify disadvantaged groups, the lack of a viable alternative has lead to the continuation of traditional testing techniques. Practitioners have attempted to temper the negative effects of these discriminatory techniques by contextualising results and interpreting scores based on their knowledge of the situational determinants of intelligence. While this may lessen the misclassification of individuals whose tests scores are lowered as a result of limited educational opportunities, little is achieved towards the development of programs to remediate disadvantage.

Since the K-ABC is based on the premise that assessment should provide a cognitive profile of strengths and weakness in order to facilitate instruction, it recognizes the dynamic nature of intelligence and therefore may be used as a tool to provide change in South Africa (Kriegler & Skuy, 1996).

Should the K-ABC, or other such cognitive assessment measures, be embraced as the preferred method of assessment in South Africa and internationally, this will also constitute a shift in traditional definitions of intelligence. No longer will intelligence embody the ability to acquire knowledge, but rather the ability to process and manipulate novel information using appropriate cognitive strategies. Definitions of intelligence will encompass the concepts of potential and cognitive modifiability and therefore embody relevance for all children (Skuy, 1995). If current definitions of intelligence are modified, this will encourage educationalists "to reflect on the purposes of education, and to radically transform the components of what we teach, the conceptualization and methods of teaching itself, and our approaches to assessment" (Skuy, 1995, p. 12). This will challenge current achievement based models of education, in favour of process based models where the focus is the teaching of thinking skills in order to promote autonomous learners.

Since cognitive based models of education are embedded within the need to recognize the potential of all, they may provide the foundation to address the needs of a large proportion of individuals who are facing academic failure due to sociopolitical disadvantage in South Africa. Assessment delineating cognitive strengths and weaknesses may ultimately become an essential tool in the restructuring of educational philosophies and objectives in South Africa and internationally.

5.3) Limitations of the Study

Due to the post hoc nature of this research, the researcher was unable to control for some of the confounding factors in the research design. The fact that the current sample was not representative of the general population is possibly the most noteworthy limitation. Firstly, the sample was drawn from a relatively privileged group of black and white children, which

is not reflective of the inequalities which exist between the black and white majority in South Africa.

Secondly, the writer proposes that the differences in the nature of the black and white sample may also have served to contrive results somewhat. The fact that the samples were drawn from remedial schools which cater for learning disabled populations, complicated the conclusions that could be drawn from results. Due to the inherent structural disadvantage that black South African children are exposed to (discussed earlier), they may be classified as learning disabled as a result of a lack of educational opportunity rather than having an actual "deficit" as such (Kriegler & Skuy, 1996). The white children in the sample are more likely to meet the criteria for a classic learning disability. Because of these discrepancies, it is difficult to ascertain whether teachers' ratings were accurate reflections of true potential and whether results are generalisable. Further research, with a larger, more representative sample, exploring the generalisability of these results to other South African children warrants investigation.

Issues with regards to the actual research methodology were also somewhat compromised due to the post hoc nature of the research. The samples were not randomly selected, but rather selected on the basis of the availability of test data for individual subjects. Due to these loose selection criteria, there were fairly large age discrepancies both between and within the black and white samples. This may have affected the pupils' scores on both the WISC and the K-ABC and consequently the limited the validity of the comparisons made.

The interval between WISC and K-ABC administration was also not controlled. For some pupils the interval between WISC and K-ABC administration was a few months while for others the interval was a year or two. Since one of the tenets in the current study is the "fluidity" of intelligence, it is unclear the extent to which actual intellectual development as opposed to test factors, influenced the differences in test performance on the two measures over time. More stringent controls were therefore necessary to ensure that the mean time lapsed between WISC and K-ABC testing was standardized.

Finally the lack of a quantitative and reliable criterion measure limited the conclusions that could be made with regards to the results. Teachers' ratings could only provide a qualitative impression of external validity which needed to be clarified in order to enhance the utility of the results reported.

5.4) Suggestions for further research and practice

Due to the limitations within the current study (identified above), it may be useful to replicate the current findings, prior to extending the field of study. It would be futile to further explore the utility of the K-ABC within the South African population, before corroborating the evidence found within this study using a larger, more representative sample and more rigorous research techniques. Once the validity of the current findings have been established more definitively, the opportunities for further research are extensive.

While the present findings offer general and tentative support for the use of the K-ABC with black South African children, more research is needed to ascertain the long and short term predictive validity of these results. Such research needs to occur in the context of a structured intervention program. Since a major goal of the K-ABC is the meaningful translation of test scores to educational strategies, the instructional value of the Simultaneous/Successive model is essential to the validity of the K-ABC. The extent to which children are able to reach their intellectual potential through cognitively based intervention programs will ultimately determine whether the K-ABC is a useful and viable alternative intelligence measure for South African children. After all, assessment for classification purposes is not sufficient to provide change in South Africa. More attention should be given to researching the use of measures such as the K-ABC as a means of enhancing teaching methods and promoting change which should be a fundamental aim of assessment in South Africa.

Since the complexity of the K-ABC has been called into question, with regard to ways in which the subscales have been operationalized, attention should also be given to researching the use of other measures derived from similar cognitive processing models

(such as the Cognitive Assessment System [CAS]) to assess whether they provide more comprehensive remedial information. Ultimately the aim should be to find the most informative measure of assessment.

The relevance of these findings is particularly pertinent in exceptional and disadvantaged groups which constitute the black sample in the current study. Considering the fact that learning disabled children are commonly identified based on discrepancies between scores on ability tests such as the K-ABC or the WISC-R, and scores on achievement tests, the extent to which these tests provide accurate measures of ability is essential to appropriate intervention. The extent to which the K-ABC is able to correctly discriminate between and within samples is therefore another relevant area for future research.

The present findings add to a body of literature establishing the utility of cognitively based models of assessment within diverse population groups. The results indicate that the K-ABC may be a useful alternative to the WISC especially for black South African children. Whether the K-ABC should replace the WISC as the primary measure of assessment in South Africa with all populations, is a question which remains to be answered. The implications of finding alternative measures of assessment go beyond the establishment of better means of classification. In line with the aims of the K-ABC, appropriate measures of assessment should provide the tools to initiate change. In the South African climate where enormous structural changes are necessary to redress years of discriminatory education, assessment geared towards practical solutions is essential to help generate educational strategies to teach children more effectively.

5.5) Summary and Conclusion

> "Experts today may still want to follow a one-dimensional scale of merit or intelligence. The measurement of merit, the quantitative as opposed to qualitative method of study leads to simple assessment of superiority and inferiority. Hence, it justifies simple policies of opposition, of exclusion and oppression. These are all the more dangerous in ignorant hands, for they contain an element of truth."
> (Darlington, 1962, quoted in Das, 1992)

Indeed, the above quotation, represents the rationale for the current research, which is an effort to identify a non-discriminatory measure of intelligence as a step towards redressing structural inequalities in South Africa.

The results obtained support the hypotheses that traditional measures of intelligence provide much lower estimates of intelligence for black children than white children, thus perpetuating perceptions of inferiority and discrimination. The K-ABC did not discriminate on the basis of race therefore challenging these discriminatory myths. The findings imply that the K-ABC, in its attempt to measure underlying cognitive processing, provides a more equitable measure of intelligence for black South African children and appears to be a useful alternative to the Wechsler scales.

The present study only examined a small and exceptional sector of South African children. In doing so, the generalisability of results was limited. Results did, however, provide tentative evidence for utility of the K-ABC which need to be corroborated within a larger, more representative sample using more rigorous criterion measures. This poses a challenge for future research.

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APPENDIX ONE

Table taken from Naglieri and Das (1990; p. 317).

Mean Factor Loadings of WISC-R and K-ABC Subtests from Three Studies

Subtest	Factor 1	Factor 2	Factor 3
Gestalt Closure	16	45*	09
Triangles	19	60*	19
Matrix Analo gies	25	38*	26
Spatial Memory	12	49*	22
Photo Series	20	50*	21
Hand Movements	10	22	44*
Number Recall	16	07	69*
Word Order	21	08	58*
Faces and Places	65*	17	16
Arithmetic	47*	26	36*
Riddles	65*	20	12
Reading/Decoding	56*	10	31
Reading/Understanding	65*	12	22
Information	68*	21	18
Similarities	63*	18	14
Arithmetic	35*	25	42*
Vocabulary	73*	13	19
Comprehension	60*	22	14
Digit Span	17	09	65*
Picture Completion	24	49*	09
Picture Arrangement	18	50*	09
Block Design	19	63*	14
Object Assembly	13	65*	10
Coding	05	31	23

Note - Average Fisher z loadings > .35 are starred

APPENDIX TWO

Parent Occupation Levels

Adapted version of the scale proposed by Warner, Meeker and Eells (1960) and revised by Morris (1985).

Category One: Professional

Professional requiring graduate/post-graduate education (e.g., doctors, lawyers, engineers, accountants) and managing directors or owners of large companies.

Category Two: Lesser Professional

Lesser Professionals not necessarily requiring graduate education (e.g., primary school teachers, nurses) and managing directors, directors or owners of small companies.

Category Three: Skilled Clerical

Sales or administrative occupations (e.g., bookkeepers, supervisors, representatives, agents, senior secretaries).

Category Four: Skilled Manual

Manually skilled workers (e.g., artisans) and lesser clerical/sales/administrative occupations (e.g., receptionists, clerks, salespersons).

Category Five: Not Working

Parents who are absent either through death or divorce, are unemployed temporarily, are unable to work, or who are home executives.

APPENDIX THREE

Teacher's Ratings of Intellectual Potential

Please would the class teacher of each of the following children rate what they believe instinctively his/her intellectual potential is, in spite of his/her poor marks or low IQ scores.

IQ	Classification
69 and below	Exceptionally Low
70-79	Low
80-89	Low Average
90-109	Average
110-119	High Average
120-129	High
130 and above	Exceptionally High

Tick the appropriate box:

Name	Below 69	70-79	80-89	90-109	110-119	120-129	Above 130

APPENDIX FOUR

Differences between the WISC-R and the WISC-III

The rationale for updating the WISC-R is cited as the need to update the norms. It is recognized that intelligence tests tend to date over a period of time in that children tested on tests with dated norms tend to perform better. Thus Average IQs appear to be higher when referenced to an outdated sample than if current norms are used, and a child's actual ability is inflated. A child's performance on the WISC-III will therefore be slightly lower than on the WISC-R in accordance with the temporary sample. Wechsler (1991), when comparing the mean Full Scale IQs (FSIQ) of the two scales, found that the WISC-III Full Scale IQ is about 5 points less than the WISC-R Full Scale IQ . The WISC-III Verbal (ViQ) and Performance Scales (PIQ) were found to be about 2 and 7 points lower than the WISC-R Scales respectively. Wechsler presents a table of expected WISC-III scores for equivalent WISC-R scores.

WISC-R	WISC-III		
IQ score	VIQ	PIQ	FSIQ
55	50-56	46-53	47-54
70	65-70	60-67	63-68
85	81-84	76-81	78-82
100	97-99	91-94	94-96
115	111-114	106-109	108-111
130	126-129	120-124	122-126
145	140-145	134-140	136-141

Ranges are 95% confidence intervals (N=206)

(Wechsler, 1991, p. 90)

Despite slight expected differences in IQ scores, there are substantial correlations between the subtest scores and the scale scores on the WISC-R and WISC-III. The Verbal Scale and the Full Scale IQs are highly correlated: $r = 0.90$ and $r = 0.89$ respectively. The

correlation between the Performance IQ scores are slightly lower although still high (r = 0.81). Wechsler (1991) concludes that "the magnitude of these correlations provides evidence that the WISC-III measures essentially the same constructs as does the WISC-R" (p. 89). It is on the basis of this supposition that the WISC-R and the WISC-III results are equated in the present study. The possible differences in scores between the two measures are not however disregarded completely and do form part of the analyses.

Author Taylor M
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