THE USE OF THREE STANDARDIZED DEVELOPMENTAL SCREENING TESTS WITH CROW HEAD START CHILDREN

by

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This work is dedicated to my parents, Ed and Jean Malone, and to my daughters, Chelsea and Wendy.

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ABSTRACT

The use of standardized developmental screening tests with Crow Native American preschool children represents cross cultural testing. This is likely to produce invalid results. Potential sources of error in testing include language differences and differences in experiential backgrounds of Crow children and children for whom the tests were developed (Brescia & Fortune, 1989; Dana, 1984; Fradd & Hallman, 1983).

This was a comparative study of the performance of 60 Crow Head Start children on three standardized developmental screening tests with the performance of the normed population for each test. The tests that were used were the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), the McCarthy Scales of Children's Abilities (MSCA) (McCarthy, 1972), and the Early Screening Inventory (ESI) (Meisels & Wiske, 1988). Children were placed into one of three groups (n = 20 per group) with each group taking two of the three tests. The test performance of the monolingual and bilingual children within the Head Start sample were compared. Correlations were run between the General Cognitive Index (GCI) of the MSCA and the PPVT-R, the PPVT-R and the ESI, and the GCI and the ESI.

The Head Start sample obtained significantly lower scores on the PPVT-R than the normed population. Head Start scores were significantly higher than the norm on the MSCA for all scales but the verbal. There were no significant differences between the Head Start scores and the normed scores on the ESI. There were no significant differences in test performances between monolingual and bilingual Head Start children. The GCI correlated significantly with both the PPVT-R and the ESI. The ESI did not significantly correlate with the PPVT-R.

Results indicated that, in this group of Crow children, the PPVT-R may be less able to distinguish delays due to cultural and language differences from delays due to a potential disability in receptive vocabulary. It is recommended that these tests be used, along with other information about a child, for making diagnostic decisions or planning developmental stimulation. Further research is required before these tests can be used to make inferences about a child's aptitude or potential.

CHAPTER 1

INTRODUCTION

Problem Statement

Health care professionals, educators, and Native American tribal leaders are increasingly aware of the necessity of supporting and encouraging achievement of children's developmental abilities through early identification, intervention, and prevention of potential problems (Berlin, 1982). Native American children are a population at risk for developmental delays due to the social conditions of poverty and alcoholism which are highly prevalent in their societies (Berlin, 1982; May, 1988, VanBreda, 1989). In many Native American communities, there is a high incidence of health problems such as fetal alcohol syndrome, otitis media, abuse and neglect, gastroenteritis, and accidents which can further influence a child's course of development (DiNicola, 1986; McShane, 1988; VanBreda, 1989). The majority of information on abilities of Native American children consists of intellectual assessment patterns of school-aged children through young adults. Little information can be found on the developmental abilities of the preschool

Native American child, a critical age for identification and early intervention.

A primary method employed by health care providers to assess the developmental status of a child is the use of standardized developmental tests or screening tests such as the McCarthy Scales of Children's Abilities (McCarthy, 1972), the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981), and the Early Screening Inventory (Meisels & Wiske, 1988). Based upon the results obtained from one of these tests, a child may be found to be above, below, or within a normal range of development as determined by norms established from previous administration of the test with various population groups. This information along with other data about the child is used by health care providers in their decisions to either monitor future growth and development of the child in a regular clinic setting, or to recommend that the child be referred for a comprehensive evaluation (Visscher, 1989). At times information obtained from developmental screening tests is used as evidence in courts of law for child protection cases. In addition, parents may gauge their success at parenting by how well they perceive their child performs on a developmental test.

Native American children are not typically represented in the population samples of standardized developmental screening tests. If they are represented, they are usually included in an ethnic group sample entitled "Other" which

also represents Chinese, Filipino, Japanese and all races not classified as black, white, or Hispanic. It is also rarely specified in discussions on validity and reliability of the tests as to whether the testers are of the same ethnic group as the subject. There have been several reports in the literature that developmental screening tests and other standardized tests of ability may not appropriately identify Native American children at risk (Brescia & Fortune, 1989; Burke, Baumgart, Sayers & Wray, 1985; Dana, 1984). Yet, the developmental abilities of Native American children are still identified with standardized tests because they have widespread public and professional acceptance, are relatively cost-efficient, and in many cases have developed into a major commercial enterprise (Miller-Jones, 1989).

A major criticism of standardized tests is that the content sampled by the test items may favor one socio-cultural experience over another or may not reflect the kind of subject matter likely to be encountered by the child (Armour-Thomas, 1992; Dana, 1984; Fradd & Hallman, 1983; Miller-Jones, 1989). Another important criticism is that the low performance of certain tasks during a testing situation may result from interpersonal aspects of the testing situation rather than from lack of competence in that task (Miller-Jones, 1989). Testing settings which elicit defensive behavior on the part of the child or which

are incompatible with the child's accustomed interpersonal interaction patterns may impact negatively on the child's test performance. This may result in erroneous judgments of the abilities of children from culturally diverse backgrounds (Armour-Thomas, 1992).

Various modifications have been developed to try to improve testing procedures. Tests have been translated into other languages and interpreters have been used in the testing situations (DeBlassie & Franco, 1983). Not only are these solutions often unrealistic and costly but they do not solve the problem of culture specific content and there may be little standardization in the content of the translated version (Fradd & Hallman, 1983). Another method that has been greatly criticized is that of adding bonus points to test scores based on minority status (Dana, 1984). Renorming the test on the culturally different population may show some promise by providing a basis for looking at test results in comparison with scores of the local peer group (Visscher, 1989).

For decisions about a child's development, multiple sources of information need to be assessed including information about the child's environment, medical history, family and childrearing patterns (Meisels, 1991). The developmental screening test when used consistently and comprehensively still remains an important method to accurately identify and refer children with developmental

delays. The problem of assessing children from culturally different backgrounds is far from solved. It is a professional and ethical responsibility to cautiously use conventional assessment or screening measures and to continue to search for methods that will accommodate the needs of culturally diverse populations (Visscher, 1989).

Purpose

The primary goal of this study is to determine the accuracy of three standardized developmental tests in identifying the presence or absence of developmental delays in a group of Native American Head Start children. The three standardized developmental tests used for the study are the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), the McCarthy Scales of Children's Abilities (MSCA) (McCarthy, 1972), and the Early Screening Inventory (ESI) (Meisels & Wiske, 1988). The information gained from this study will provide data to facilitate more appropriate developmental screening and intervention with Native American children.

Hypotheses

To sharpen the focus and to further clarify the study, the following null hypotheses were formulated:

1. The performance on the PPVT-R for the Head Start sample will be no different from the performance on the PPVT-R reported for the normed population.

2. The distribution of PPVT-R standard equivalent scores for the Head Start sample will be no different from a normal distribution.

3. There will be no difference in the performance on the ESI in the critical age ranges for the Head Start sample and in the performance in the corresponding age ranges reported for the ESI normed population.

4. The verbal, perceptual, quantitative, general cognitive, motor and memory performance on the MSCA for the Head Start sample will be no different than the performance reported in these areas on the MSCA for the normed population.

5. The distribution of each of the six MSCA scale index scores for the Head Start sample will be no different from a normal distribution.

6. The standard score equivalents for the PPVT-R, the General Cognitive Index scale score for the MSCA, and the total screening score for the ESI (all ages) will not vary significantly with each other.

7. In the Head Start sample, the children who are monolingual and the children who are bilingual will have no significant differences in their standard equivalent score

on the PPVT-R, in any of their six scale index scores on the MSCA, or in their total screening ESI score.

Operational Definitions

The variables of interest were operationalized as follows:

1. Head Start is a federally funded preschool program for 3-5 year-old children from low socio-economic backgrounds.

2. Crow Indian Reservation is the area of land in south-central Montana, bordering the state of Wyoming, located mainly in Big Horn County and belonging to and governed by the Crow Indian Tribe. Enrollment into the Crow Indian Tribe must be approved by the Crow Tribal Council. A current enrollment requirement is a blood quantum of one quarter (Moran, 1989).

3. A Native American is a member of any one of the tribes of North American Indians.

4. Standardized test is an instrument composed of empirically selected items that has definite instructions for use, adequately determined norms, and data on reliability and validity (NAEYC, 1988). For this study, standardized tests refer to the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), the McCarthy Scales of Children's Abilities (MSCA) (McCarthy, 1972), and

the Early Screening Inventory (ESI) (Meisels & Wiske, 1988).

5. Developmental screening test refers to tests used to identify children who may be in need of special services, as a first step in identifying children in need of further diagnosis. The test focuses on the child's ability to acquire skills (NAEYC, 1988). In this study, the MSCA, ESI, and the PPVT-R are developmental screening tests.

6. Accuracy refers to how well a screening test identifies children who are developmentally delayed and in need of special services regardless of their cultural and linguistic background (Visscher, 1989). This is further defined by assessing the percentage of children who would be referred as a result of their score on the test. This will consist of those Head Start children scoring 1.5 standard deviations below the mean score reported for the standardized population for each developmental test. The percentage of Crow Head Start children in the referral group for each developmental test of this study should correspond to the national prevalence rate in the general population for the developmentally delayed children which is about 12% of the population (Haring & McCormick, 1986). The percentage of Crow Head Start children scoring in the referral range on each test should also correspond to the 11% rate reported for the MSCA and the PPVT-R and the

5% rate reported for the ESI. A further indication of accuracy is the correlation of scores between the developmental screening tests. The results of the team evaluations that would follow referral of a child and determine his/her eligibility for special services would also indicate accuracy but this is beyond the scope of this study.

7. Normal distribution refers to a form of description in which the values of a variable are arranged in a pattern that is bell-shaped, symmetrical, unimodal, and not too peaked. Half of the observations lie above the mean and half below it (Freedman, Pisani, & Purves, 1980).

8. Testing refers to the administration, scoring, and interpretation of scores on a standardized test (NAEYC, 1988).

9. Identify refers to the testing process whereby certain children are found to be in need of more testing and evaluation for further diagnosis and/or special services. This is determined by how many months they are delayed in certain areas of sensorimotor performance in comparison to their peers (Visscher, 1989).

10. Developmental delay is identified in those children scoring in the "refer" range on a developmental test which are usually those children scoring two standard deviations below the standardized mean score for the test.

11. Developmental ability is the chronological age equivalent at which children successfully perform a group of sensorimotor tasks in comparison to the mean age of successful performance of their peers (McCarthy, 1972).

12. Standardized or normed population is the specified group of test takers whose performance on a test is used as the statistical basis for comparing and interpreting the scores of other individuals or groups who take the same test after them (Omark & Watson, 1983).

13. Tester is the person(s) who administer the developmental screening test to the child.

14. Monolingual refers to those children understanding and speaking only the English language.

15. Bilingual refers to those children who are able to either speak the Crow language and/or fluently understand the Crow language.

Assumptions

It is assumed that since the General Cognitive Index has correlated with both the PPVT-R (Oakes & Faust, 1990) and the ESI (Meisels & Wiske, 1988) that the ESI and the PPVT-R will also correlate.

CHAPTER 2

REVIEW OF LITERATURE

There is long-standing controversy regarding assessment of children from culturally and linguistically different backgrounds. Researchers have sought to solve testing problems encountered with culturally diverse populations by focusing on such assessment aspects as cultural bias, differences in perceptual and cognitive styles, and influence of culture on learning and assessment (Fradd & Hallman, 1983). A growing body of information has been amassed related to the school-aged child, but there are still gaps in the literature pertaining to developmental screening of preschool children. Published material related to assessment of Native American preschool children is even more limited. The purpose of this literature review is to: (a) review the extant theories and research on the developmental abilities of children from culturally different backgrounds, (b) discuss the implications of developmental testing of culturally different children, (c) give perspectives for developmental testing and screening for preschool children from culturally diverse backgrounds, and (d) develop a conceptual framework.

Theoretical Background

In an attempt to explain the unique patterns of ability and achievement in Native American children several theoretical models have been proposed. Among the models that will be discussed are cause-effect models, group comparison models, developmental change models, contextualist models, and cultural disorganization.

Cause-Effect Models

Cause-effect models have their roots in perspectives developed from statements of an eighteenth century pioneer in child psychology, John Locke (Omark & Watson, 1983). Locke (1690) argued that at birth the mind is like a white paper void of all characteristics and that whatever the child becomes as an adult is almost completely the result of experiences and learning. This view proposes that if one performs a series of actions before a child, this will cause within the child the effect of learning something.

In applying the cause-effect model, researchers may question whether outside causal factors such as language, race, poverty, or single-parent families cause interruptions in achievement of developmental abilities in children (Omark & Watson, 1983). This concept is further explained by three overlapping concepts: disadvantage, deficit, and deprivation (McShane, 1983). The disadvantage hypothesis suggests that Native American children

experience detrimental environmental conditions that place them at greater disadvantage and risk in relation to more fortunate groups of children. Economic poverty, poor housing, poor health care, crowded living space, and access to lower quality educational programs and experiences are factors not supportive of, and may impede development (McShane, 1983; May, 1988).

Conditions of disadvantage along with other factors may lead to specific deficits such as epidemic prevalence of middle-ear disease resulting in hearing loss and possible language deficiencies (McShane & Plas, 1982; McShane, 1988). High prevalence of untreated alcoholism in some tribal communities increases the number of Fetal Alcohol Effect infants who may exhibit moderate to severe cognitive delays (McShane, 1983). Native American children experience higher rates of morbidity from accidents, meningitis, pneumonia, and gastrointestinal illness, all of which can cause developmental deficits in motor, cognitive, and verbal abilities (Berlin, 1982; May, 1988).

A combination of disadvantage and deficit merges into deprivation (McShane, 1983). Poverty and substandard crowded living conditions lead to more illnesses which can cause disruptions in parent-infant bonding and less opportunities for infants to be developmentally stimulated. Economic pressures may lead to high mobility of families and children between households and communities causing a

loss of stability and continuity in child rearing and probable deprivation of essential social and cognitive experiences. In short, the disadvantage/deficit/deprivation model proposes a multitude of negative factors that are severely detrimental to the Native American child's ability to develop mentally, emotionally, spiritually, and physically thus placing him/her at high risk for developmental delays and future academic failure (McShane, 1983).

Group Comparison Models

A concept related to cause-effect relationships is group responses to test situations (Omark & Watson, 1983). To see whether a particular cause had some effect, statistical models were developed to "prove" a cause-effect relationship. Spearman (1927) laid the foundations for statistical group comparison models by using general mathematical laws derived from correlations. He noted that all tests of ability are positively correlated. Spearman (1927) deduced that this is possible because there is a fundamental energy factor "g" at work in all tests of mental ability. This mental energy and a sense of an individual's overall ability can then be captured mathematically in terms of the individual's test score's relative distance from a group mean. Hence, the birth of standardized testing and comparison of individual or group

scores with standard scores. Virtually all statistical models depend on group comparisons (Omark & Watson, 1983). It then follows that a primary purpose of most standardized tests of developmental ability is to ascertain individual and group differences in performance (Armour-Thomas, 1992).

Developmental Change Model

Adequate description of human phenomena cannot be achieved by entirely relying upon the measurement and comparison of individual or group performance to a standardized norm. Piaget's model of human abilities represents children as proactive rather than just reactive to their environment (Crain, 1985). Piaget (1936) did not believe that children's thinking is shaped by adult teachings or other environmental influences. Piaget recognized that children pass through general stages of development and that these stages do not genetically unfold but represent increasingly comprehensive ways of thinking. Children must interact with the environment to develop; it is they, not the external environment who build more elaborate cognitive structures to deal with their environment (Crain, 1985). Piaget's findings suggested that children's minds cannot be filled at will. Children, in a large part, determine what stimuli will be attended to and how these stimuli will be incorporated into their world view (Dulay & Burt, 1980).

Rather than cause-effect, the aim of experiments using the Piagetian cognitive tasks is to define progressions in the use of thought for making sense out of the environment (Irvine & Berry, 1988). In other words, the dependent variable is the age in months when success in an item type (such as conservation of liquid) that defines a mental stage (such as "concrete operations") is registered. In Piagetian thought there is no mean by which to fix a deviation; rough age limits for the progression of the thought system are offered, but there is not much concern about precocity or lag. Even though Piagetian research focuses on individual assessment it still resembles group tests by conforming to a standard procedure of task administration in order to meet the requirement for homogeneity in the method. This is a necessary constraint of any empirical observation (Irvine & Berry, 1988).

Clarizio (1982) stated that Piagetian tasks offered promise for understanding the intellectual functioning of Native American children. Dana (1984) stated that Piagetian tasks measure fluid intelligence and use theory-based attempts to define developmental benchmarks in logical reasoning. He stated that these tests presuppose no interest in individual differences or comparisons with age and grade norms and are more likely to be culture-fair, child-relevant, and essentially descriptive of current developmental status. Glick (1985) proposed that Piaget's

theory is inherently acultural in the sense that structures of knowledge may be constrained by cultural experiences but are not determined by it. Research in several cultures on the attainment of Piagetian logical structures has provided only partial support for this position. Most cultures display cognitive operations characteristic of Piaget's early stages, that of preoperational and early concrete operational thinking. Yet, great variation has been found in the age or rate of attainment and many people in specific cultures never demonstrate reasoning associated with the later stages of late concrete and formal logical operations (Dansen, 1984; Dansen & Heron, 1981). Both the forms of reasoning in these latter stages and the measures used to assess them appear to be highly specific to and sensitive to cultural experience (Glick, 1985).

Contextualist Models

Based on the contextualist perspective (Miller-Jones, 1989; Vygotsky, 1978) it can be inferred that attempts to interpret a task's meaning in a testing situation, are related to a person's prior culturally contexted social experiences and activities. Certain socio-cultural experiences may stress sets of competencies and cognitive organizations that are different from those expected in assessment situations. In other words children may have many culturally determined problem-solving and

information-organizing strategies or modes available to them which may or may not be activated or elicited by a test format (Miller-Jones, 1989).

Appropriate testing of developmental abilities involves a determination of how well any particular testing situation matches the function-specific practices individuals experience as part of their social-cultural context (Sternberg, 1988). Children's social-cultural ecologies pose problems and tasks that function to organize their intellectual processes. Thus, the meaning taken in a task situation will reflect cultural values for interpreting the situation which the child has acquired from his/her social interactions (Miller-Jones, 1989).

The assertion that culture provides a background against which information is organized has been reported in the literature dating back to 1969. Two specific ways of organizing information are analytical and relational thinking (Cohen, 1969). For example, grouping chairs and tables together because they all have four legs is an example of analytical thinking whereby objects are associated by shape. Grouping objects because of their related utility is an example of relational thinking whereby objects are associated by their utilitarian value (Fradd & Hallman, 1983).

Cohen (1969, 1971) reported that relational conceptual styles as opposed to analytic styles are associated with

families that have flexible interchangeable functional roles (e.g., who does child-care, who cooks). He also reported that analytical thinking is found more frequently in highly industrialized societies whereas relational thinking is more common in minority and rural cultures. Segel (1970) stated the lack of parental practices that provide the opportunity for differentiation and abstraction is also related to the use of more relational categories in classification sorting tasks. Berry (1971) found that individuals from societies that depended on hunting and fishing for their food tend to be superior on spatial ability tests and measures of cognitive differentiation than individuals from societies where food is readily available. All children have the capacity for various kinds of intellectual operations but some operations and organizations occupy higher levels of probability of occurrence than others within a child's repertoire of problem solving methods (Miller-Jones, 1989).

The contextualist interpretation suggests that different cultures tend to develop different cognitive skills among their members that differ than from the cognitive skills of members from other cultures (Armour-Thomas, 1992; Fradd & Hillman, 1983; Miller-Jones, 1989). Due to these differences one can see the pitfalls of transporting an ability test from one culture to another with translation into their language being the only

distinguishing change. The measures or criteria for an assessment test of abilities may reflect the professional and societal goals of one culture and may not be an indicator of intrinsic abilities. An experimental or testing situation sets up an artificial context and the gap between the natural or learned context is potentially larger for those cultures which differ the most from that of the tester's culture. Yet, test scores take little or no account of the differential gap for different groups of people. To understand a set of abilities within a given culture, one must understand it in terms of the adaptive requirements of that culture. Such understanding requires a grasp of how thought is linked to behavior in that particular environment (Sternberg, 1988).

Sternberg (1988) stated that the components of mental processes such as encoding stimuli from the environment, inferring relations between stimuli, mapping higher order relations between relations and applying relations are universal and probably do not differ from one culture to another. However, the components of intelligence cannot be measured independently of some context. Competency can only be assessed through observation of performance which is influenced by cultural and linguistic variables. Sternberg stated that the situation is bleak if the goal is to be able to compare the abilities of people across cultures according to some universal standard. He stated

that it is possible to specify just what aspects of intelligence or ability are specific to a given culture in terms of contextual requirements and what aspects are shared with at least one other culture. Therefore, a more realistic goal would be to fully understand the ability and intellectual functioning within culture and to compare only those particular aspects of ability or intelligence that do intersect between pairs of cultures.

Cultural Disorganization

Since culture provides a background for organizing information, a problem occurs when an individual for some reason (sociological, geopolitical, economical) becomes culturally deprived or alienated from his/her culture. Children who are enmeshed in relations between two conflicting cultures are caught up in a complex and bewildering set of forces. They are simultaneously pressured to assimilate (relinquish cultural identity and take on the larger society identity), to integrate (maintain cultural integrity while becoming a part of a larger society), to reject (by withdrawing from contact or influence of the larger society), and to experience marginality (a combination of cultural loss, deculturation, and exclusion from participation in the dominant society) (McShane, 1983).

Feurstein (1979) stated that cultural disorganization results in disruption of intergenerational transmission of cultural identity and uniqueness. He hypothesized that the individual who has learned to function within his or her own culture has learned to adapt and has established the prerequisites for learning and continued adaptability. Cultural deprivation may strongly affect the adaptive capacities of the child since he or she becomes devoid of the learning skills and habits that are produced by the transmission process.

Essentially, the cultural disorganization/disruption model proposes that the Native American child, depending on how much his/her culture in conflict with the dominate society, may be divested of some of the opportunities to acquire adaptive capabilities to learn because of the interruption, disruption, and disorganization of the normal enculturating and socialization process (McShane, 1983). McShane also stated that a perceived consequence of the combined impact of the cultural disorganization and the disadvantage models is an over-reliance upon the support structures within the larger society. As welfare becomes an integral part of economic, family, and individual systems, incentives to learn, to progress and to improve are lost. Dependence versus self-reliance, independence, and self-determination then may become a developmental

issue as it may influence parenting and quality of learning experiences provided to children.

Summary of Theoretical Models

The theoretical basis underlying the unique patterns of ability and achievement of culturally different children, specifically Native American children, is broad and encompasses several different perspectives. The issues raised by the theoretical literature raise serious questions about the assumptions or premises of standardized developmental tests for Native American children. From a cultural perspective, it would appear that the manifestation of developmental abilities are interwoven within one's cultural experiences and that it is imperative that cultural influences on test performance be understood. From a group comparison perspective, it is apparent that testing procedures are standardized for purposes of reliability and cannot readily adjust for every different cultural background. Yet, from disadvantage and disorganization concepts, it is clear that Native American children are at risk for developmental delays and it is even more crucial that developmental screening tests be appropriately used in order not to over or under identify children in need of services.

Implications for Developmental Testing

General Implications

The practice of administering standardized tests to young children has increased dramatically in recent years. PL 99-457, Part H has thrust early identification and intervention into the forefront of the nation's social policy for children (Shonkoff & Meisels, 1990). Most states have designated departments of Public Health as the lead agency for PL 99-457 which underscores the critical role of pediatricians and other health care workers in the early identification of young handicapped children as they are often the first and only professionals in contact with young children and their families (Glascoe, Martin & Humphrey, 1990). In their expanded role of early identification of delayed children, health care providers may be expected to not only detect developmental delays but also to determine program eligibility by percentage of delay relative to chronologic age, age equivalents, or cutoffs reflecting standard deviations from the mean. In this respect, the use of developmental screening tests by health care workers will remain at the heart of PL 99-457 (Glascoe, Martin, & Humphrey, 1990).

Many school systems now routinely administer some form of standardized developmental screening test for admittance to kindergarten. As a result, more five-year-olds are

denied admission or are recommended to some form of developmental kindergarten. Such practices disregard the potential, documented long-term negative effects of retention on children's self-esteem and the fact that a disproportionate number of low-income and minority children are among this group (Smith & Shepard, 1987).

Because of the wide spread use of standardized testing of young children ages three through eight years of age, the National Association for Education of Young Children (NAEYC) issued a position statement on standardized testing which includes definitions and guidelines on their use (NAEYC, 1988). Among their recommendations are: (a) all standardized testing used in early childhood must be reliable and valid, (b) any decision about the child should not ever be based upon a single test score, and (c) testing of young children must recognize and be sensitive to individual diversity (NAEYC).

The NAEYC (1988) expressed concern that test developers frequently ignore cultural variations and variations in the quality of experiences provided for different children. It is easier to mass produce tests if one assumes that cultural differences are minimal or meaningless. These assumptions permit attributing all variances or differences in test scores to differences in individual children's capacities. However, these assumptions are false and standardized tests should not be

used in multicultural/multilingual communities if they are not sensitive to the effects of cultural diversity or bilingualism.

The NAEYC (1988) further recommended that the burden of proof for the validity and reliability of tests is on test developers and those advocating their use. Rather than using a test of doubtful validity, it is better not to test. The potential for mislabeling is particularly great with young children where there is wide variation in what may be considered normal behavior. Responsibility for choosing, administering, scoring, and interpreting a score from a standardized test rests with the professional and demands that the professional ensure that the test meets scientific standards and reflects current scientific knowledge.

However, as programs of early identification become more context-oriented, the search for tests and measures becomes more elusive. Meisels (1991) stated that tests normed on one group of children cannot be considered valid for another significantly different group without explicit standardization for that group. He also noted that there are numerous problems with defining a delay in terms of standard deviations, a practice 25% of states use to determine eligibility for developmental delay programs. Descriptively, a standard deviation represents a spread of specific scores or performances around a mean. This is

based on the concept that these measurements are bell-shaped or symmetric. Meisels's position is that even when mean abilities are equal, distributions of these abilities may vary. This is often the case when two separate groups are administered the same test or when tests are used that have different standardization samples.

Standard deviations may have a place in establishing population norms in screening tests that (a) have been validated against widely used outcome measures of development, and (b) are used in combination with other sources of data about the child. In reality one single test cannot accomplish the task for early identification. A process containing multiple levels and multiple sources of information obtained on multiple occasions must be devised (Meisels, 1991).

The NAEYC (1988) also raised a content validity issue for any standardized test in early childhood. Tests address the more easily measured aspects of development and omit content areas of creativity, social competence, self-esteem, and disposition toward learning which are harder to measure but not less important aspects of development. Garcia Coll (1990) noted that investigators have used sensorimotor tasks as their main outcome measures, neglecting the inclusion of other domains of development such as socio-emotional or subtle aspects of cognitive functioning. This may be especially important in testing

of minority children since socio-economic background is often confounded with ethnicity. Multiple-risk indexes such as mental health, anxiety, minority status, family support, and life events have predicted substantially more variance in verbal IQ scores at 4 years of age than did socio-economic status (Sameroff, Seifer, Borocas, Zax, & Greenspan, 1987).

Implications for Native American Children

Brescia and Fortune (1989) proposed that testing Native American children using tests developed for the majority American society represents a case of cross cultural testing which is likely to produce invalid results, usually in the form of underestimation of the children's performance. In test based decisions concerning the Native American child, this can have grave consequences. The child could be placed in programs that are too easy or boring, be denied advanced placement, and have self-esteem and confidence problems.

There are several potential sources of error in testing Native American children which stem from cultural difference. These include: lack of compatibility of the languages, differences in the experiential backgrounds of the children being tested and the children for whom the test was developed, and differences in affective dispositions toward handling testing environments between

the two groups of children (Brescia & Fortune, 1989). These are further explained as follows.

Dana (1984) reported that Native American children are uncomfortable with aspects of the testing situation such as establishing eye contact, verbal interaction, and being assertive in performing gross motor activities in front of a stranger. He also reported that language difference may raise seemingly impenetrable barriers to effective communication between the participants in a testing situation. Behavioral differences and interpretation of behavior between Native American children and the non-Native American tester can result in nonverbal miscommunication which could alter testing results.

Native American tribes have a wide range of differences with regard to culture. Native Americans should not be treated as a collective group regardless of their tribal membership. This is the same error of consideration that is made in testing Native American students with standardized tests that have less than three percent Native American students in the norming sample. However, uniform research on the study of testing results within the context of tribal culture is nonexistent. Bias found in the study of one tribe is likely to exist for several other tribes. A source of underestimation documented for one tribe should be considered as a potential source of underestimation for other tribes until

research indicates the contrary for a given tribe (Brescia & Fortune, 1989).

Underestimation may occur in the standardized testing of Native American children because the child may not have the assumed experience to respond to certain test items. The isolated, rural environment of many reservations, the restricted poverty of many families, and cultural ties may provide little opportunity for Native American children to practice key behaviors required by developmental screening tests (Brescia & Fortune, 1989). Many Native American children are frequently in settings where there are few books, puzzles, blocks and other similar toys. These items may be prioritized by their adult caregivers as less important compared to other family necessities or activities. Differences in test behavior of the Native American child may then reflect cultural and environmental differences rather than lack of knowledge of what is being tested (Neely & Shaughnessy, 1984). If children presented only one unsuccessful test taking behavior in a given testing situation then a methodology could be developed to correct the problem of bias. But, behaviors are confounded in that they sometimes occur jointly and at different times during the test taking process (Neely & Shaughnessy, 1984).

Many Native American children possess other individual characteristics which may present testing problems such as, low parental education, low test motivation, broken homes

and non-standard English-speaking backgrounds (Neely & Shaughnessy, 1984). Other factors associated with unsuccessful test taking in Native American groups are cultural beliefs regarding competitive behaviors in which it is unacceptable for individuals to become the center of attention (Horejsi, 1987). In a study of Native American adults' performance on a national normed test, Hoffman (1985) suggested that acculturation and test motivation are associated. This meant that adults who had more exposure to dominate society values performed more competitively on the tests. Deyhle's (1986) study showed that Navaho students had a different perception of the purpose and significance of tests than Anglo students. Students may underestimate the seriousness of the test or may fail to adopt successful response strategies.

Language factors are a leading cause for underestimation of a Native American child's test performance (Brescia & Fortune, 1989). Tests which avoid language use are not subject to underestimation as much as those that depend on verbal instructions or reading (Shutt, 1962). However, Cohen (1969) reported that pictorial representations were found to produce more culturally biased assessment than tests which relied on language because there are less specific rules for interpreting pictorial items than for verbal items.

Further confounding the language issue is the decline in use of an ancestral language amongst many tribal groups. Anderson and Anderson (1983) reported that fluency in the native language is highly correlated with fluency in English. However, many tribal languages are rapidly losing their vocabulary and undergoing simplification of syntax. They also identified that the stops, the intonation and use of syntax in Indian English closely resembled the native languages of several tribes. This points to a prominence of native language entrants into Indian English dialects. Anderson and Anderson alerted educational service providers that there needs to be a realization of the important role played by the dialect of Indian English. There needs to be the realization that dialect production does not represent a lack of understanding of Standard English but a culturally dictated mode of interaction. Thus, not only bilingual Native American children, but those speaking only English may still perform differently on a test requiring language use.

Cummins and Swain (1986) stated that in societal situations where there is likely to be serious erosion of the native or first language, it is crucial that programs aim toward its development and maintenance. They proposed that there is a threshold level of linguistic competence which bilingual children must attain in both their first and second languages in order to avoid cognitive

disadvantages. These authors stated that the quality of parent-child communication in the home is crucial to the child's future academic success. They suggested that minority language parents expose their children to the minority language as much as possible in the preschool years and that parental use of broken English or a mixture of the minority language and English may cause the parent to spend less time communicating with their child. This could have potentially disastrous effects by preventing a solid foundation for the acquisition of English language skills.

Most of the studies in the literature addressing standardized testing of Native Americans are limited to school-aged children, college students, and adults and consist mostly of intellectual assessment (McShane & Plas, 1982; Dana, 1984). There are few studies specifically addressing developmental screening of Native American preschool children. In spite of problems in test bias, there is some knowledge of unique patterns of performance exhibited in the intellectual assessment of several Native American groups. Most of these patterns have been observed in older Native American children but are pertinent to preschool developmental screening.

Traditional Native American cultures foster the development of performance abilities and minimize opportunities for processing information in abstract verbal

terms (McShane & Plas, 1982b). High visual-spatial abilities have been reportedly consistent across tribes. Spatial abilities were more well-developed than sequencing skills and there was greater strength in relational, holistic, and right hemisphere information processing (Dana, 1984; Diessner & Walker, 1986; McShane & Plas, 1982b). Historically, adaptation to Native American lifestyles required superior perceptual-motor skills, emphasis upon concrete reality, and individuality of objects at the expense of generalizations (Dana, 1984).

The extent to which verbal skills are developed among Native Americans is a function of acculturation to middle-class, white society (Dana, 1984). English conceptual abilities may be lower because traditional Native American children in some tribes do not analyze experience in verbal terms. An acculturated parent and/or early experience with a white peer group are necessary for development of an approach to learning that fosters the use of concepts and generalizations across contexts (Dana, 1984).

McShane and Plas (1984) concluded after a review of 35 studies of intellectual performance of Native American children that even though the current research base suggests the pattern of performance mentioned above, it is not adequate enough for a comprehensive interpretation of their performance. Yet, many Native American children may

be labeled developmentally delayed due to cultural differences rather than true delays.

Perspectives in Developmental Screening

This section reviews current efforts in reducing bias in standardized developmental screening tests. Examples of studies where specific tests have been used are discussed. A practical view on standardized developmental screening is presented.

Efforts to Reduce Test Bias

In testing culturally different youth, the most viable approach is somewhat eclectic and tends to focus on three variables: the tester, the testee, and the test (Visscher, 1989). Ideally, the tester should be fluent in the language of the child and understand the culture of the child (Dana, 1984). Some researchers questioned if this assumption has been backed by good empirical research (Anastasi, 1976; DeBlassie & Franco, 1983). Testers should be skilled at assessment (Nuttall, 1987) and should communicate with the family about the testing situation (Lidz, 1982). The training of testers must include explicit monitoring of the extant literature as it applies to practice and culturally-relevant professional experiences (Dana, 1981, 1984). In cases where a non-professional interpreter is used to translate, the

results will be suspect (DeBlassie & Franco, 1983; Lidz, 1982).

The assessment of preschool children has its challenges because of the unique nature of the testee (Visscher, 1989). Preschool children may not have the ability to sit still for long periods of time or to verbalize clearly (Lidz, 1982). The child's level of English proficiency and behavior during the test will affect his/her performance and the tester's perception of it (Nuttall, 1987). The tester must be flexible and sensitive to the cognitive, social, and perceptual styles of the child. Also the more relevant or familiar the tasks and setting are to the child, the more likely it is that the results of the screening will be valid (Meisels, 1991). The NAEYC (1987) strongly stated that the most important consideration in evaluation and using standardized tests is to improve services for children and ensure that children benefit as a result of their use.

The majority of effort in nondiscriminatory testing has been aimed at reducing bias in the test itself. Several approaches have been tried and all have advantages and disadvantages. Translation of existing nationally normed tests into the language of the test is frequently used (Dunn & Dunn, 1981; McCarthy, 1972; Williams & Williams, 1987). Fradd and Hallman (1983) reported that problems with this approach occur because translations skew

the testing process in both the content and the context of the language used. They reported that alert testers may use information gained from this type of testing to plan programs but not for comprehensive evaluations.

The establishment of regional or ethnic norms for each test is used by some researchers to reduce test bias. Sidles and Macavoy (1987) made Navaho local norms for the Ravens, a visuo-spatial intelligence test. Visscher (1989) normed the Batelle Developmental Screening Test for Crow preschoolers and found that she obtained referral rates closer to the national incidence for handicapping conditions. Whereas, before the local norms were established there was an over referral rate. This practice has been criticized as having the potential of leading to lower expectations for minorities which in turn, may lower children's aspirations to succeed. Local norming does not necessarily take into account the complex reasons why minority children, on the average, score lower than white middle-class children and may invite unjust comparisons between racial groups (DeBlassie & Franco, 1983).

Researchers have used Piagetian tasks to evaluate developmental abilities because they concentrate on non-verbal performance, define developmental benchmarks, and use qualitative scoring that presuppose no interest in individual differences or comparisons with age norms (Clarizio, 1982). Results obtained when using this test

have shown great cultural variation in the age or rate of attainment of Piaget's preoperational and concrete stages (Cummins, 1984; Glick, 1985). Many people in specific cultures never demonstrate reasoning associated with Piagetian stages of late concrete and formal operations. This appears highly sensitive to cultural experience (Glick, 1985).

An alternative to tests has been the use of various behavioral rating scales and a trend toward identification of young children's strengths rather than their deficits. These scales have included scales on motivation, creativity, and leadership characteristics. Torrance (1982) developed a list of strengths and positive characteristics of culturally different children. These characteristics could be observed and could possibly be quantified. They include such items as expression of emotions, ability to improvise, enjoyment of visual arts, originality in problem solving, fluency in figural media, articulateness in socio-drama, and humor.

Through Project Spectrum, Krechevsky (1991), has studied an alternative assessment approach of preschool children based upon Gardner's (1983) theory of multiple intelligences and Feldman's (1980) theory of development in non-universal domains. Assessment of the child involves observation of the child's activities in several domains throughout the school year. There is blurring between

assessment and the classroom curriculum so that it takes place in the child's natural environment and is embedded in meaningful, real-world activities. Project Spectrum emphasized children's strengths and domains of competence. Obviously, this type of developmental assessment is time consuming and not practical in most health care settings. However, it may be particularly suited for assessment of diverse populations since it takes individual differences seriously (Krechevsky, 1991).

Examples of Specific Cross-Cultural Studies

Studies using standardized developmental screening tests with culturally different populations report mixed results concerning the validity and usefulness of the test or instrument chosen. The following examples focus on the use of three specific tests: the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), the Early Screening Inventory (ESI) (Meisels & Wiske, 1988) and the McCarthy Scales of Children's Abilities (MSCA) (McCarthy, 1972). Each test has been standardized for direct assessment of developmental abilities of children, is widely used, and has been tested for reliability and validity.

Sattler and Altes (1984) evaluated the receptive vocabulary ability and nonverbal cognitive ability of monolingual (Spanish-speaking) and bilingual

(Spanish/English-speaking) Mexican-American preschool children, ages 45 to 65 months. The children obtained significantly lower scores on the PPVT-R than on the Perceptual Performance Scale of the MSCA. The monolingual group's PPVT-R Spanish scores were significantly lower than the PPVT-R norm group. Their MSCA Perceptual Performance Scale scores were also significantly lower than those of the McCarthy standardization group. The bilingual group obtained significantly lower Spanish PPVT-R scores than those in the PPVT-R norms. However, the MSCA Perceptual Performance Scale scores were not significantly different from those of the norm group. Sattler and Altes (1984) concluded that the PPVT-R whether in English or Spanish should not be used to assess intellectual capacities of Hispanic children. However, the MSCA Perceptual Performance Scale (which had been translated into Spanish) appears to be useful instrument for assessing the cognitive abilities of both monolingual and bilingual Hispanic preschool children.

Sharpley and Stone (1985) administered the PPVT-R to Australian children to determine if significant cultural differences were apparent. They reported no significant differences between means of raw scores for their sample and the norm sample. Teuber and Furlong (1985) administered the English versions of the PPVT-R and the Expressive One-Word Picture Vocabulary Test (EOWPVT) to

50 Mexican-American children. Results reported for both tests were two standard deviations below the norm mean score.

Valencia and Rankin (1985) reported that mean scores on the General Cognitive Scale for 31 English-speaking Mexican-American children and for 43 Spanish-speaking Mexican-American children were extremely close to the norm mean score of 100. These mean scores were 100.6 (SD=12.7) and 92.1 (SD=9.5) respectively. The English-speaking group used a carefully translated Spanish version. Valencia (1988) reported that the MSCA has promise as a psychoeducational assessment tool for English-speaking Puerto Rican and Mexican American children. For Spanish-speaking children interpretation of test performance must be made with caution. Similarly favorable results were found with the ESI. Weloe-Crow (1990) reported that the ESI identified Spanish-speaking children's abilities to acquire new skills in the Visual/Motor, Language and Cognition, and Gross Motor/Body Awareness domains.

Summary of Perspectives in Developmental Testing

The problem of nonbiased developmental screening and testing continues despite extensive research. Native American children represent an understudied and very much at-risk population for misinterpretation of developmental screening tests or other standardized tests of ability.

They are also a population at risk for developmental delays because of adverse living conditions and health problems. The practice of developmental screening of Native American preschool children warrants investigation because standardized screening tests are the main tool used to determine whether a child has delays requiring more extensive evaluation (Visscher, 1989).

DeBlassie and Franco (1983) stated that standardized tests, even though most are culturally biased and favor the middle-class mainstream, still can serve as very effective diagnostic indicators. They further stated that standardized tests are unfavorable to culturally different youth if they are used for the purposes of predicting success in academic and employment settings. Even then, this is not the fault of the tests but the manner in which tests are used and interpreted (DeBlassie & Franco, 1983). To the alert tester, standardized developmental screening tests can indicate a child's development in terms of abilities and limitations (DeBlassie & Franco, 1983; Fradd & Hallman, 1983; NAEYC, 1988). Using both test and nontest data (such as information about the family), the tester can proceed to describe a plan to enhance each individual's potential. DeBlassie and Franco stated that the predictive validity of most standardized test scores are poor but the diagnostic validity is excellent if tests are used in conjunction with nontest data and demographic information.

They advised that test users not declare a moratorium on the use of standardized tests with culturally different youth. Instead testers should use caution in interpreting results and apply results in the best interest of the child.

The literature supports the use of standardized developmental screening tests that have established reliability and validity when they are used for diagnostic purposes and to make informed decisions that enhance the development and education of culturally different youth (DeBlassie & Franco, 1983; Meisels, 1991; NAEYC, 1988). The literature also supports obtaining baseline or standard information on the group of children in question for a test that has been normed on a significantly different group of children (Meisels, 1991; NAEYC, 1988; Visscher, 1989). An analysis of the comparison of referral rates, distribution of scores, and mean scores between a group of children tested and the standardized or norm population will give valuable information about the tests' usefulness in accurately identifying developmentally delayed children in need of more comprehensive evaluation.

Increasing knowledge about the performance of certain developmental screen tests in culturally different children such as Native American Head Start children, will help prevent erroneous judgments about their performance abilities and will increase efforts to provide the services

of early identification of delays and appropriate intervention. Through such efforts, there will be more information available to promote decisions that will allow culturally different children to develop their full intellectual, social, physical, emotional, and spiritual potential.

Conceptual Framework

To integrate the various developmental theories and issues involving the test, the tester, the child, cultural influences and language that have been previously discussed, a conceptual model (Figure 1) has been developed based on the work of McShane (1983). This model explains the factors influencing the unique patterns of ability and achievement of Native American children observed in a developmental screening test setting. As illustrated in Figure 1, the observed developmental abilities consist of, but are not limited to, a group of sensorimotor tasks that a child performs at a given point in time. Three levels of factors (family, child, tester) directly or indirectly influence the observed developmental abilities of the child. Three environmental components (socio-economic, transcultural contact/conflict, and peer norms) influence the nature of the developmental screening testing situations.

Observed Developmental Abilities

Performance =

Sensorimotor Tasks

*Verbal *Perceptual *Motor *Cognitive

*Quantitative *Adaptive *Memory

1. Tester => Gate Keeper: Expectations, Perceptions, Language Behavior, Knowledge Screening Tool Used

E N V I R O N M E N T

Transcultural contact/ Conflict ->

Socio-Economic ->

Peer Norms ->

2. Child => Ability Verbal/ Nonverbal <-> Motivation Orientation <-> Behavioral Style <-> Emotional & Physical Health <-> Testing Experience

3. Family/ Community => Language; Cultural Orientation; Health, Support, Stability of Family/Community

Figure 1. Factors Influencing the Observed Developmental Abilities of a Child During Developmental Screening Testing. Based on McShane's (1983) Transcultural and Developmental Model explaining achievement patterns of American Indian children.

The first or primary level of influence upon the observed developmental abilities of a child in a developmental screening test situation lies within the tester. The tester functions in his or her role as the actor with the greatest amount of formalized control in the testing situation (Mcshane, 1983). The tester's language, cultural perceptions, knowledge about testing, experience with testing instruments, choice of testing instruments, expectations, and behavior (as controller or gatekeeper) either enables or disables secondary influences.

Secondary influences (filtered through the tester) involve five major child dimensions interacting with one another (McShane, 1983). Verbal-nonverbal abilities, motivation orientation (intrinsic vs. extrinsic), behavioral style (indirect vs. cooperative), emotional and physical health (transient situational disorders, depression, acute or chronic condition), and previous experience with testing, characterize unique aspects that the Native American child brings to the testing situation.

Tertiary level influences, primarily flowing from family and community contexts, provide the basis for understanding the configuration of child characteristics. The contextualist models (Miller-Jones, 1989; Vygotsky, 1978) suggest that language and unique English language experience contributes to unique developmental ability configurations. It also suggests that culturally contexted

life experiences contribute to these unique developmental abilities, as well as to motivation orientations and behavioral styles that vary significantly from that of majority culture children (Brescia & Fortune, 1988; McShane, 1983). The cultural disruption/disorganization model suggests that as the health and stability of the family and community are fragmented by transcultural contact and conflict, the primary support for emotional health of the child is undermined which will further impact on the child's test performance and observed developmental abilities (McShane, 1983).

Environmental influences include peer established testing norms both local and national which according to the group comparison model form a criteria from which testing performance is evaluated (Omark & Watson, 1983). Environmental influences such as economic poverty, poor housing, crowded living space, access to quality health and education all exert influence on the tester, child, and family in various degrees (McShane, 1983). Transcultural environmental influences such as exposure to dominate societal attitudes, values and climate also influence all participant levels during the developmental screening test experience.

CHAPTER 3

METHODS

Design

This study compared the test performance of a sample of Native American Head Start children to that of the normed population of children for each test. Specifically, mean test scores, referral rates, and distribution of scores were compared. Because Native American children comprised less than 1% of the normed population of children for each test, the Native American sample of children can be distinguished from the normed population by independent variables related to cultural factors such as language. The children's test scores which represented their responses to the developmental items of ability provided in each of the screening tests were treated as the dependent or outcome variable. This study was ex post facto in design since the research was conducted after the variability in the independent variable had occurred (Woods & Mitchell, 1988). This study was part of a larger study funded by Montana State University College of Nursing block grant.

Sample

Subjects were 60 Native American children who attended Head Start on the Crow Reservation during the November 1991 to April 1992 time period. Head Start is a federally funded preschool program for 3 to 5 year-old children from low socio-economic backgrounds. There was a total enrollment of 284 children for the 1991-1992 school year. There are five different Head Start centers located throughout the reservation. The majority of the sample for the study attended the largest center, Crow Center Head Start. All of the children were from families that met federal guidelines for low-income with the average annual household income at $10,745 (Head Start, 1992).

For the 1991-1992 school year, Head Start reported that 32% of the enrolled children were from single parent families; 62% from two parent families; and 6% were cared for by a relative or foster parent. The average education level for the head of the household was eleventh grade. The unemployment level for the head of the household was 48%. Twenty-two percent of the children were fully bilingual while another 30% did not speak their native language but understood it fluently. Ten percent of the children enrolled were receiving services for various problems; the majority of these were speech delays or

articulation problems, and behavioral problems involving hyperactivity and discipline (Head Start, 1992).

The sample size of 60 was determined to be adequate since this group of children is homogeneous in terms of residence, household size, education level of parents, cultural context, and exposure to preschool activities. There were 33 girls and 27 boys included in the study. Age range was from 3 years to 6 years. Criteria for inclusion in the sample were: (a) Native American child with one parent or grandparent enrolled in the Crow tribe, (b) residence in Big Horn County, (c) child's age between 3 years 5 months to 5 years 9 months, (d) attendance in Head Start since October 1991, and (e) no previous diagnosis of mental retardation.

Data Producing Instruments

Three instruments were used for data collection in this study (see Appendix A). These instruments were chosen because they have been standardized for direct assessment of developmental abilities of preschool children and they are currently used by local care providers and educators. The Peabody Picture Vocabulary Test-Revised was chosen because it is used locally for assessing receptive vocabulary and because vocabulary is an important measure of child development. Oral language is widely recognized as a prerequisite to success in work and higher education

(Dunn & Dunn, 1981). The McCarthy Scales of Children's Abilities was chosen because it is a more comprehensive developmental test and specific for children ages 2 through 6. It is locally used on a more limited basis since it is more time consuming to administer. The Early Screening Inventory was chosen since it is a specific developmental test for children 4 to 6- years-old, is often used to test for school readiness, and is easily administered. Each instrument has been widely used and tested for reliability and validity. Each instrument has published norm referenced means and standard deviations. Instructions for testing and scoring are clear and guidelines for referral are given. Permission to use the instruments were granted by the publishers for each instrument. Information specific to each instrument follows.

Peabody Picture Vocabulary Test-Revised (PPVT-R)

The PPVT-R (Dunn & Dunn, 1981) was designed primarily to measure receptive (hearing) vocabulary for Standard American English. Regression analyses have indicated that while verbal comprehension abilities may contribute most to successful performance on the PPVT-R, perceptual organization abilities also play a significant role in the child's performance on the PPVT-R (Hollinger & Sarvis, 1984). This test can be classified as a developmental test because it is an age-related norm-referenced assessment of

a set of skills that have been acquired by children (NAEYC, 1988).

In scoring the PPVT-R, a total raw score is given for the number of correct responses over a critical range. This score is then converted to a score derived from the standardized or norm-referenced score which allows comparison of the individual performance to the standardized population. Three deviation-type age norms are reported: standard score equivalents, percentile ranks, and stanines. The median standard score equivalent is 100 with a standard deviation of 15. The median standard error of measurement for standard score equivalents is 7 points for all ages (Dunn & Dunn, 1981).

The standardization sample consisted of 4200 children and was stratified to represent population data from the 1970 U.S. Census. Approximately 15% of the sample were nonwhite children with the majority of this group being Black and Hispanic. The age range of the children was from 2 years 6 months to 18 years 11 months (Dunn & Dunn, 1981).

Dunn and Dunn (1981) reported PPVT-R test reliability as follows. Split-half reliability coefficients for the PPVT-R ranged from .67 to .88 (a median .81) for children and youth. Immediate retest reliability coefficients for raw scores ranged from .73 to .91, with a median of .82. Delayed retest reliability coefficients ranged from .52 to

.90, with a median of .78. Reliability for the PPVT-R appears to be satisfactory.

Test validity for the PPVT-R is also favorable. Dunn and Dunn (1981) reported that the PPVT-R correlated most highly with other measures of vocabulary such as the Stanford-Binet vocabulary subtest (.72), the Expressive One-Word Picture Vocabulary Test (.70), and the Full-Range Picture Vocabulary Test (.86). The PPVT-R correlated moderately well with tests of scholastic aptitude (Hollinger & Sarvis, 1984). The PPVT-R correlated to a reasonable degree with measures of school achievement administered concurrently but did less well as a predictive measure of school success (Dunn & Dunn, 1981).

McCarthy Scales of Children's Abilities (MSCA)

The MSCA (McCarthy, 1972) was designed to determine younger children's general intellectual level as well as their strengths and weaknesses in important developmental abilities. The McCarthy Scales are appropriate for children from 2½ through 8½ years of age. Scores or indexes are derived from 18 subtests which are game-like activities of mental and motor ability.

The subtests have been grouped into five scales: Verbal, Perceptual-Performance, Quantitative, Memory, and Motor. A sixth index, the General Cognitive Index (GCI) is an overall score derived from the Verbal,

Perceptual-Performance, and Quantitative Scale. The Memory Scale consists of four tests, each of which is also included on the Verbal, Perceptual-Performance, and Quantitative Scale. Three of the five tests on the Motor Scale belong exclusively to the Motor Scale and thus are not included on the General Cognitive Scale. The remaining two tests of the Motor Scale are included on the Perceptual-Performance Scale, and therefore the General Cognitive Scale (McCarthy, 1972).

For each of the six Scales, the child's raw score is converted to a scaled score, called an Index, according to his/her chronological age. The General Cognitive Index (GCI) has a mean which has been set at 100, and a standard deviation of 16. The scores for each of the remaining five Scales have a mean of 50 and standard deviation of 10 (McCarthy, 1972).

The standardization of the McCarthy Scales was based on a nationwide sample that was stratified on several major variables in accordance with the latest estimates available from the U.S. Bureau of the Census. The sample population consisted of 1032 children, 170 were nonwhite with 154 being Black. The remaining 16 children were American Indian, Oriental, Filipino, Chicano, and Puerto Rican (McCarthy, 1972).

Reliability studies done on the MSCA are reported by McCarthy (1972) as follows. Internal consistency was

indicated by a split-half coefficient of .93 on the GCI scale for 10 normative groups. The averages for the other Scales range from .79 to .88. Test retest coefficients reflected a high degree of stability with .90 obtained for the GCI Scale, and correlations from .75 to .89 for the other four cognitive Scales. The lowest coefficient was .69 for the Motor Scale from 7½ to 8½ years of age. Standard error of measurement for the GCI Scale was 4.1 points. The average standard error of measurement for the other Scales ranged from 3.4 to 4.7. In all, the reliability coefficients and the standard errors of measurement give evidence that the six Scales are both internally consistent and stable.

Since the McCarthy Scales of Children's Abilities is a widely used and comprehensive development evaluation in students, it has been used in several studies as a criterion test. Faust and Hollingsworth (1991) used the MSCA for concurrent validation of the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R). Their results indicated a moderate and significant correlation (.62 to .71) between the WPPSI-R Full Scale IQ and the MSCA General Cognitive Index (GCI). Backman, Cornwall, Stewart and Byrne (1989) examined the power of the MSCA to predict Wechsler Intelligence Scale for Children-Revised (WISC-R) performance in children referred for neuropsychological assessment. Findings showed significant correlations

between the GCI and WISC-R Full Scale IQ, the Perceptual-Performance Scale and the WISC-R Performance IQ, and the Verbal Scale and the WISC-R Verbal IQ. However the MSCA Verbal Scale did not appear to be as good a predictor of later ability as the WISC-R Verbal IQ. In a study of performance among "at-risk" and normal preschoolers the McCarthy GCI seemed to provide an accurate estimate of the "at-risk" child's typical classroom performance and corresponded significantly with the Kaufman Assessment Battery for Children (Zucker & Copeland, 1988).

Early Screening Inventory (ESI)

The ESI (Meisels & Wiske, 1988) is a brief developmental screening instrument that is individually administered to children 4 to 6 years of age. It was designed to identify children who may need special educational services in order to perform adequately in school. The ESI samples performance in several areas of development: speech, language, cognition, perception, and gross and fine motor coordination. The ESI is intended to survey a child's ability to acquire skills rather than the child's level of skill achievement (Meisels, 1985).

The ESI is divided into three main sections: Visual-Motor/Adaptive, Language and Cognition, and Gross Motor/Body Awareness. The Visual-Motor/Adaptive section examines fine motor control, eye-hand coordination, the

ability to remember visual sequences, the ability to draw visual forms (two-dimensional), and the ability to reproduce visual structures (three-dimensional). The Language and Cognition items focus on language comprehension and verbal expression, the ability to reason and count, and the ability to remember auditory sequences. The Gross Motor/Body Awareness section examines balance, large motor coordination, and the ability to imitate body positions from visual cues. In addition to these sections, the ESI includes two other items: the Draw A Person test (DAP) and letter writing (Meisels & Wiske, 1988).

Three recommendations may be made on the basis of the total ESI score: OK, rescreen, or refer. Based on the standardized reference population which consisted primarily of Caucasian children drawn from low to lower-middle socio-economic status urban families, the refer range includes scores lower than two standard deviations below the mean score for each age range; the rescreen range is between one and two standard deviations below the mean; the OK range includes scores higher than one standard deviation below the mean. The mean score for the norm reference population ranged from 21.3 for the youngest age group to 27.2 for the older children (Meisels & Wiske, 1988).

Reliability for the ESI was reported by Meisels and Wiske (1988) as follows. An item analysis showed that ESI items clearly discriminated between OK and refer groups

with at least 75% of the children passing the items in the OK groups and 60% of the children in the refer group failing each item. Interscorer reliability percentages were higher than .80 with a total score correlation of .91. Test-retest reliability showed a .82 percent agreement for the total score on the ESI (Meisels & Wiske, 1976).

Concurrent validity for the ESI was demonstrated by using the McCarthy Scales of Children's Abilities as the criterion measure (Meisels, 1984). A correlation coefficient of .73 ($p < .001$) was obtained from comparison of the ESI total screening score with the GCI of the MSCA. The correlation remained unchanged by the effects on the sample of age, gender, or socio-economic status. From the data of this study it can be inferred that the ESI generally measures the same domain of skills, knowledge, and abilities that are measured by the GCI of the MSCA (Meisels & Wiske, 1988).

Meisels and Wiske (1976, 1988) demonstrated short-term predictive validity of the ESI by comparing the ESI scores obtained on children prior to or in the first 2 months of the kindergarten year with a readiness test given at the end of kindergarten. The Metropolitan Readiness Test (MRT) was used as the criterion of measure. Results reported showed an 83% agreement between the two tests indicating that ESI results are a predictor of reading readiness at the end of kindergarten. Meisels and Wiske (1988) reported

that sensitivity and specificity rates of the ESI are moderate to high in kindergarten but become less stable thereafter.

Data Collection

Parents and guardians of the children were contacted by the researcher during a health screening session held at the Crow Head Start in October, 1991. The project was described to the parents/guardians which included the purpose, protection of confidentiality, possible risks and benefits, and their right to refuse participation without any repercussion. Parents who were not at the health screening were contacted later and given the same information. A total of 87 parents/guardians signed the consent for their child to participate in the study. After the consent was signed, selection criteria information was reviewed and it was determined that 67 children met the criteria. These names were then put in a hat and 60 names were randomly drawn out and placed into three groups. Group One was given the Peabody Picture Vocabulary Test-Revised (Form L) and the McCarthy Scales of Children's Abilities. Group Two was given the Peabody Picture Vocabulary Test-Revised (From L) and the Early Screening Inventory. One child was inadvertently given all three tests which gave Group One an n of 21. Groups 2 and 3 each had an n of 20. Group Three was given the McCarthy Scales

of Children's Abilities and the Early Screening Inventory. By placing the Head Start sample into these three groups, it was possible to correlate sample means between two tests because the same child took both tests. This gave an n of 20 for each of the correlations between test groups. This group configuration also made it possible to have an n of 40 by which to compare the Head Start sample mean scores for each developmental test to the corresponding standardized population for the test.

Children were given the tests at the Head Start Center in a private office. The researcher spent the first 5 minutes of each session establishing rapport with the child. There were two children who refused to participate and their names were replaced by drawing from the remaining seven names in the hat. To avoid test fatigue, most of the tests were administered in the mornings on separate days from one to three days apart. On the average, children took 15 minutes to complete the PPVT-R; 20 minutes for the ESI; and 50 to 60 minutes for the MSCA. Children in Group Two were able to complete the ESI and the PPVT-R in one session. The researcher administered and scored all the tests except for five PPVT-Rs and five ESIs which were administered by the researcher's thesis chair. The tests were administered according to the standard instructions provided by the corresponding test manual. Each test

received a code number; no child's name was placed on a test.

Data Analysis

Upon completion of data collection, the test responses were scored according to the individual test directions. These results were entered into the SPSS data analysis program (Nie, Hull, Jenkins, Steinbrenner, & Best, 1983). Descriptive statistics were used to compute means, standard deviations, distributions, and referral rates. Histograms and tables were used to further explain the data. Although the numbers for the Head Start sample were small, statistical comparisons were possible, and the *t* test was used to evaluate the difference between the means of the sample data and that of the reference population for each test. The *t* test was used to compare differences in mean scores on each test for bilingual and monolingual Head Start children. A correlation was run on the following pairs of mean scores for the Head Start sample: (a) the scale index mean for the GCI of the MSCA and the standard scale equivalent mean for the PPVT-R, (b) the scale index mean for the GCI of the MSCA and the mean total screening score of the ESI, and (c) the standard scale equivalent mean for the PPVT-R and the mean total screening score of the ESI. The Lilliefors test was used to determine if the distribution of Head Start Sample scores for each test was

normal. For purposes of this study, the significance level was established at $\underline{p} \leq .05$.

Human Subjects

Prior to initiation of the study, the Montana State University Human Subjects Committee reviewed the project proposal and concluded that the rights of the participants were adequately protected and confidentiality assured. Permission was obtained from Dr. Jean N. Gullicks, principle researcher, to use the data from the Montana State University College of Nursing block grant (see Appendix B). In addition, the proposal was also reviewed and approved by the Crow Tribal Madam Chairman. Permission was also obtained by the Crow Indian Health Service Unit Director and the Director of the Crow Head Start Program. Before testing, informed written consent was obtained from all of the participants' parents or guardians. Verbal consent was obtained from each child who was free to choose to participate or stop at any time during the test administration.

There were no physical risks to the children who participated. Some children might experience minor frustration at not being able to complete a task, but a wide range of behavior is sampled so that the children have the opportunity to try a variety of activities. Some children might be shy or fearful at being alone with the

researcher but particular effort was made to establish rapport and approach the child with an air of confidence and give a positive introduction to test surroundings and materials.

Children were free to stop the testing at any time. All data was accessed only by the researcher and the researcher's thesis chair who assisted with data collection. No names or other personal identifying information were contained in printed or reported data.

There were no direct benefits for the participants. Benefits to children will be derived from learning more about the use of standardized developmental tests with Native American children and how they can best be interpreted for the benefit of children. Risks are minimal in relationship to the potential benefits of knowledge gained about the use of standardized developmental tests with Native American children.

CHAPTER 4

RESULTS

The purpose of this study was to determine the accuracy of three standardized developmental tests in identifying the presence or absence of developmental delays in a group of Native American Head Start children living on or adjacent to the Crow Indian Reservation. The three standardized developmental tests used for the study are the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), the McCarthy Scales of Children's Abilities (MSCA) (McCarthy, 1972), and the Early Screening Inventory (ESI) (Meisels & Wiske, 1988). Results are discussed as follows.

There were 60 Head Start children who participated in the study. These children were randomly assigned into one of three standardized test groups, each with an n of 20. Since one child was inadvertently given all three tests, Group 1 had an n of 21. The three test groups were found to be fairly evenly distributed as far as number of boys and girls, mean age and age range, and number who were bilingual and monolingual (see Table 1).

Table 1. Head Start Sample Assignment into Test Groups.

Group	Instruments	n	M/F	Bilingual/ Monolingual	Mean Age	Age Range
1	PPVT-R/MSCA	21	8/13	13/8	4y5m	3y5m-5y3m
2	PPVT-R/ESI	20	9/11	8/12	4y10m	4y1m-5y5m
3	MSCA/ESI	20	10/10	8/12	4y2m	4y2m-5y7m

To determine the number of children who took each separate test, the number of children in each test group was added. For example, the 21 children in Group 1 who took the PPVT-R were added to the 20 children in Group 2 who took the PPVT-R to give a total n of 41. Again, the group configuration for each separate standardized developmental screening test was fairly evenly distributed for gender, age, age range, and number of children bilingual and monolingual (see Table 2).

Table 2. Head Start Group Configuration for Instruments.

Instrument	n	(M/F)	Bilingual/ Monolingual	Mean Age	Age Range
PPVT-R	41	17/24	21/20	4y7m	3y5m-5y5m
MSCA	40	18/22	21/19	4y7m	3y5m-5y7m
ESI	40	19/21	16/24	4y10m	4y1m-5y7m

The first null hypothesis, there will be no difference in performance on the PPVT-R for the Head Start sample and the normed population, was rejected based on the *t* test. The Head Start sample standard equivalent score (mean = 77.4) was significantly lower than the standard equivalent score (mean = 100) reported for the normed population. In addition, 56% of the Head Start sample PPVT-R scores were in the moderately low to extremely low range compared to 11% for the normed population. Over half of the Head Start sample scored 1.5 standard deviations below the normed mean. This is a 56% referral rate for possible delays in receptive vocabulary for the Head Start sample (see Table 3).

Table 3. Comparison of Head Start Sample and Normed Sample for the PPVT-R.

Test	n	Mean	SD	t	df	Ref. Rate
Head Start PPVT-R	41	77.4	11.84	-12.20***	40	56.1%
Normed $PPVT\text{-}R_s$	700	100.0	15.00			11.0%

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$
$_s$ = standardization (normed) sample data (Dunn & Dunn, 1981).

The second null hypothesis, the distribution of PPVT-R standard equivalent scores for the Head Start sample will

be no different than a normal distribution was retained. The Lilliefors statistical test for normal distribution of scores indicated no significant difference from normality L (41, $\underline{n}$ = 41) = .0703, $\underline{p}$ > .200. The histogram Figure 2 (see Appendix C) shows the distributions of PPVT-R standard equivalent scores for the Head Start sample.

Null hypothesis three, there will be no difference in the performance on the ESI in the critical age ranges for the Head Start sample and the performance on the ESI in the corresponding age ranges reported for the ESI normed population, was retained. Based on the $\underline{t}$ test, for each of the four age ranges tested, there was no significant difference between the mean scores for the Head Start sample and the ESI normed population (see Table 4).

Table 4. Comparison of Head Start Sample and Normed Sample for the ESI.

Age (mo.)	n	Mean	SD	t	df	Ref. Rate
48 - 53	8	18.38	5.15	1.61	7	0.0%
48 - 53_s	50	21.3	5.4			5.2%
54 - 59	20	22.30	4.75	.85	19	5.0%
54 - 59_s	227	23.2	5.3			5.2%
60 - 65	9	25.0	3.87	.70	8	0.0%
60 - 65_s	175	25.9	5.4			5.2%
66 - 71	3	25.0	1.00	3.83	2	0.0%
66 - 71_s	--	27.2	5.4			5.2%

* p ≤ .05
$_s$ = standardization sample data

The percentage of the Head Start sample who scored in referral range on the ESI (two standard deviations below the normed mean for each age range) was equivalent to normed population only for the 54 months to 59 months age group. This age group had a referral rate of 5% which compared to the 5.2% referral rate for the ESI normed group. For the Head Start sample, the age groups 48 months to 53 months, 60 months to 65 months, and 66 months to 71 months, had no children scoring in the referral range.

Null hypothesis four, the verbal, perceptual, quantitative, general cognitive, motor and memory performance on the MSCA for the Head Start sample will be no different than the performance reported in these areas on the MSCA for the MSCA normed population, was rejected for all areas of performance except the verbal. The Head Start group scored significantly higher than the MSCA normed population for perceptual performance ($p \leq .05$), and for the general cognitive, quantitative, memory, and motor performances ($p \leq .001$). Head Start sample referral rates for delays compared favorably to the normed MSCA population in the verbal performance area only (see Table 5).

Table 5. Comparison of Head Start Sample and the Standardization Sample for the MSCA.

Scale	n	Mean	SD	t	df	Ref. Rate
Verbal	40	51.53	10.40	.90	39	10.0%
$Verbal_s$	512	50	10			11.0%
Percep	40	53.95	9.77	2.56*	39	7.5%
$Percep_s$	512	50	10			11.0%
Quant	40	61.25	10.64	6.69***	39	2.5%
$Quant_s$	512	50	10			11.0%
GCI	40	109.03	15.11	3.78***	39	2.5%
GCI_s	512	100	16			11.0%
Mem	39	62.67	10.61	7.45***	38	2.6%
Mem_s	512	50	10			11.0%
Motor	39	59.51	6.91	8.60***	38	0.0%
$Motor_s$	512	50	10			11.0%

*$p \leq .05$ **$p \leq .01$ ***$p < .001$
$_s$ = standardization sample data (McCarthy, 1972)

Null hypothesis five, the distribution of each of the six MSCA scale index scores for the Head Start sample will be no different from a normal distribution, was retained. Lilliefors tests for all scales had significance greater than .200 indicating a normal distribution (see Table 6). The histograms Figures 3 through 8 (see Appendix C) show the distributions of MSCA scale index scores for the Head Start sample.

Table 6. Summary of Lilliefors Scores for Head Start MSCA Scale Indexes.

Scale Index	Lilliefors	df	Significance
Verbal	.0661	40	> .2000
Perceptual	.0523	40	> .2000
Quantitative	.0784	40	> .2000
GCI	.0631	40	> .2000
Memory	.0743	40	> .2000
Motor	.0707	40	> .2000

Hypothesis six, the standard score equivalents for the PPVT-R, the scale index score for the GCI of the MSCA, and the ESI total screening scores will not vary significantly with each other, was partially rejected. Pearson product correlations between the Head Start test groups showed that the GCI correlated significantly with the PPVT-R. The GCI correlated significantly with the ESI total screening score. The PPVT-R did not correlate significantly with the ESI (see Table 7).

Table 7. Correlations Between Pairs of Test Scores.

	GCI	PPVT-R	ESI
GCI		.57**	.76***
PPVT-R			.28

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$

Hypothesis seven, the Head Start sample of children who are bilingual and who are monolingual will have no significant differences in their standard equivalent scores on the PPVT-R, no significant differences in any of their six scale index scores on the MSCA, and no differences in their total screening score on the ESI, was retained. The *t* test compared the monolingual Head Start children and the bilingual Head Start children's test performance for each test. Monolingual and bilingual children did not differ significantly (see Table 8).

Table 8. Comparison of Head Start Sample Monolingual and Bilingual Test Performance (Mean Scores).

Test	Mean (Monolingual)	SD	Mean (Bilingual)	SD	t
PPVT-R	76.0	10.8	79.3	13.0	-.87
ESI	21.3	5.7	23.8	3.3	-1.56
Verbal (MSCA)	50.8	10.2	52.3	10.8	-.44
Percep. (MSCA)	54.6	11.0	53.4	8.6	.38
Quant. (MSCA)	60.7	8.0	61.8	12.9	-.32
GCI (MSCA)	107.4	13.4	110.78	16.8	-.68
Memory (MSCA)	61.3	8.5	64.1	12.5	-.82
Motor (MSCA)	58.3	8.1	60.8	5.3	-1.13

*$p \leq .05$

In summary, four of the null hypotheses were retained. There were normal distributions of scores for the Head Start sample for both the MSCA and the PPVT-R (hypotheses 2 and 4). Head Start ESI performance did not significantly differ from the normed ESI population (hypothesis 3). Bilingual and monolingual Head Start children had no significant differences in their test performances (hypothesis 7).

Two null hypotheses were partially retained. The GCI correlated with the ESI and the PPVT-R (retained), but the ESI did not correlate with the PPVT-R (hypothesis 6). For hypothesis 4, only Head Start verbal MSCA performance was retained as having no difference with the normed MSCA population. Head Start performance on the other five MSCA scales did significantly differ from the normed performance. Hypothesis 1 was rejected as Head Start PPVT-R performance significantly differed from normed PPVT-R performance.

CHAPTER 5

DISCUSSION

A brief summary of results for each standardized developmental screening test will be discussed. This will be followed by discussion of the distribution of score results, the correlation of test results, test performance of bilingual/monolingual children, and extraneous/ interpersonal factors that may have influenced results. Finally, conclusions based upon this study and implications for future research will be presented.

PPVT-R

A summary of data results indicated that the Head Start children scored significantly lower on the PPVT-R than the standardized PPVT-R population. Fifty-six percent of the receptive vocabulary scores for the Head Start sample were at or below the sixth percentile. When interpreting this result, the tester needs to be aware that development of the PPVT-R was based on the English vocabulary skills of primarily middle-class Caucasian children and is reflective of their cultural/linguistic experiences. Since a large percentage of the Head Start group tested at a low level of receptive English vocabulary

acquisition, this is indicative that the Head Start group does have cultural and linguistic experiences different from the normed population and the tester. Possibly words used in the PPVT-R are used with less frequency in the day-to-day experiences of the Head Start group than they were used by the normed group. The PPVT-R results for the Head Start group indicated that this group has of yet inadequately developed English language receptive vocabulary acquisition. No inferences can be made about the verbal abilities, aptitudes, or potential based upon these PPVT-R test results.

MSCA

PPVT-R results contrasted sharply with the children's performance on the MSCA. The Head Start sample scored significantly higher than the standardization sample in perceptual, quantitative, general cognitive, memory, and motor abilities. Verbal ability scores for the Head Start children approximately equaled the standardization sample scores. Referral rates for the Head Start sample on the MSCA (percentage of children with scores 1.5 standard deviations below the mean) were lower than the 11% referral rate reported for the standardization sample. Referral rates for delays ranged from 0.0% for the Motor Scale to 10% for the Verbal Scale.

Higher Head Start sample scores on the MSCA compared to the PPVT-R are consistent with performance by culturally different populations as reported in studies where language tests and general performance tests were compared (Sattler & Altes, 1984; Teuber & Furlong, 1985; Valencia, 1985). Interpretation of Head Start MSCA results may indicate that the MSCA items are less culturally diverse than PPVT-R items. MSCA test items may be more familiar and more frequently encountered by the Head Start group on a day-to-day basis. The higher MSCA scores by the Head Start group are consistent with reports in the literature that Native American cultures foster development of visual-spatial and perceptual motor skills (Dana, 1989; McShane & Plas, 1982). This researcher has noted that the Crow tradition of storytelling to children may foster verbal and numerical memory skills. The Head Start sample scored in the above average range in verbal and numerical memory skills. Since referral rates on the MSCA for the Head Start sample are well below the 11% national normed rate, more testing with a larger sample is recommended to ensure that the MSCA is sensitive and will discern children with developmental delays in this Native American group of children.

ESI

Results for the ESI were reported by age group because the ESI does not convert raw scores into equivalent or

scaled scores. Thus, three of the Head Start ESI age groups had very small numbers (n = 3, n = 8, n =9). Head Start children's performance on the ESI for 54 to 59 months age group (n = 20) did not vary significantly from the ESI standardization sample. Referral rates for delays for this age group on the ESI approximately equaled the standardization sample rate. The Head Start sample results for the other three age groups for the ESI are suspect since the group numbers were too small to be meaningful.

ESI results for the Head Start sample are difficult to interpret due to the uneven and low numbers in each of the four age groups. However, since referral rates for the 54 to 59 months age group (n = 20) were close to the standardization referral rate, the ESI might be a test that is both sensitive and specific (does not over or under identify delays) with this group of Native American children. The ESI has more verbal expressive items rather than verbal receptive. These items (block, button, ball, car) were all familiar to the children. The children who took both the ESI and the MSCA were challenged by the ESI block building test which required them to copy a structure that they had not been shown how to build. The ESI score is based on the total score for all items. There were no cut off scores for separate performance areas (i.e., visual-motor/adaptive, language) so only the total performance was compared to the standardization sample.

Score Distributions

The distribution of the Head Start PPVT-R scores was a normal distribution, as was the distribution of the scores for all six scales of the MSCA. The distribution of the ESI scores was not analyzed and compared to a normal distribution since the numbers in each age group were small. When the distribution resembles a normal curve, the standard deviation is a useful statistic for summarizing the average deviation about the mean and discerning the degree to which individual performances differ from one another (Meisels, 1991). In addition, the standard deviation is useful when interpreting the scores of an individual within the distribution. A Head Start child's score of 139 on the General Cognitive Index (GCI) indicates that he/she scored approximately 2 SD above the average GCI score for the Head Start distribution of scores and about 2.5 SD above the average GCI score for the standardization sample. In contrast, a Head Start child's receptive vocabulary score (PPVT-R) of 100 is about 2 SD above the average score for the Head Start sample and exactly the mean or average score when compared with the standardization population.

Knowing a distribution resembles a normal curve is useful in interpreting how extreme or typical a given score might be. With normal distributions, 99.7% of the

observations will fall within 3 SD of the mean, 95% of cases within 2 SD of the mean, and 68% of the cases within 1 SD of the mean (Woods & Mitchell, 1988). Knowing that the PPVT-R and the MSCA have normal distributions within the Head Start sample, suggests that these tests can discern individual variability within the Head Start sample. However, since the Head Start sample mean and the standardization population mean differed significantly for both of these tests any interpretation of individual performance would have to be made with caution.

Correlation

Results indicated that the General Cognitive Index of the MSCA correlated significantly with the PPVT-R. This was consistent with information on the PPVT-R and the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) where there was a mean correlation of .58 (Dunn & Dunn, 1981). Dunn and Dunn also reported that mean PPVT-R scores were 13.2 points lower than the mean WPPSI IQ scores. This difference was attributed to the greater number of perceptual-motor tasks included at the lower levels of the WPPSI. Sattler's and Altes (1984) reported that the correlation between the Spanish PPVT-R scores and the Perceptual-Performance Scale scores was not significant in their study on the performance of bilingual and monolingual Hispanic preschool children on the PPVT-R and

the Perceptual-Performance Scale of the MSCA. They also reported that the bilingual children scored almost 2 SD below (mean = 72.9) the norm score on the PPVT-R but had a mean score of 54 (no significant difference with the norm population mean) on the Perceptual-Performance Scale of the MSCA. This was similar to the Head Start sample whose mean score on the PPVT-R was somewhat higher at mean = 77 but still almost 2 SD below the standardization sample and whose mean score on the Perceptual-Performance Scale of the MSCA was 54.

The Head Start sample General Cognitive Index also correlated highly significantly with the total screening score of the ESI ($r = .76$, $p \leq .001$). This was consistent with the concurrent validity study of Meisels's and Wiske's (1988) where a correlation coefficient of .73 ($p < .001$) was obtained between the two test scores. Meisels and Wiske inferred from these data that the ESI generally measures the same domain of skill, knowledge, and abilities that are measured by the GCI of the MSCA. In The Head Start sample, ESI total screening scores did not correlate significantly with the PPVT-R scores. This could be a result of different standardization samples used with the two tests or because the tests do not measure the same domains.

Monolingual and Bilingual Performance

The bilingual Head Start children in the sample did not differ significantly from the monolingual children in any of their test performances. The bilingual children had slightly higher (1-3 points) mean scores than the monolingual children on all tests but this difference was not significant. One explanation for this is the limited sample size. Another possible explanation is that language dominance was determined by subjective report of Head Start teachers and parents. Language dominance tests were not done on the sample to measure true language dominance. Still, another explanation is the possible prominence of native language entrants into Indian English (Anderson & Anderson, 1983).

Interpersonal and Extraneous Influences

Other possible influences on the accuracy of the three developmental tests will be discussed from the standpoint of interpersonal and extraneous aspects of the testing experience and possible cultural factors influencing the test. The tester was Caucasian and spoke only English to the testee. Because the overall testing took approximately six months to complete, the Head Start children became very accustomed to seeing the tester and much less hesitant to go with the tester. Half of the PPVT-R testing was given

in the first three months of the Head Start testing period, however, half of the MSCA testing and half of the ESI testing were also given during the same time period.

The Crow Head Start program has noted that referral rates for delays decrease from Fall to Spring possibly due to the Head Start services provided to the children (Visscher, 1989). Children who took the tests in the latter half of the six month interval may have had some advantage over those taking the tests earlier. Another environmental factor that may have influenced results is that testing often took place in the speech room where there were pictures of various animals on the wall. This may have influenced a verbal fluency item on the MSCA in which children were asked to think of as many animals as they could within a 20 second time period.

The most common affect of the children, the testees, was shyness. Most of the children were quiet and waited for task items to be explained to them. Children often sought some type of evaluative feedback on how they were doing. Sometimes this occurred by checking the facial expression of the tester or by inquiring about the tester's behavior. Rarely, with the exception of motor ability items, did children provide their own evaluative feedback by saying "I'm good at this!" or by showing a satisfied facial expression. Children often used local or familiar items on their verbal fluency items, such as "deer", "elk",

"mountain lion" (animals), "elk tooth dress", "moccasins" (things to wear), "horse", "bull" (things to ride).

An analysis of the frequency of missed test items was not conducted for this study. A general overview of some items that appeared to be missed most often were "What is a factory?" on the MSCA, and the following words on the PPVT-R: helicopter, sail, net, cage, envelope, penguin, pasting, and parachute. All of these items are examples of objects that the children in this rural setting may have less opportunity to have encountered in their daily experiences.

Conclusion

The results provided by this study do not allow a decision to be made about whether or not the PPVT-R, the MSCA, or the ESI are accurate measures of Crow Head Start children's receptive vocabulary and developmental abilities. Results do not clearly indicate how accurate these tests are in detecting developmental delays for this group of Native American children. Results do give base line information about the performance of these tests in a small group of Crow Head Start children. Specifically, results indicated the mean test scores, the distribution of scores, and the present referral rate for delays for each test. Caution must be used in interpreting individual developmental abilities based upon the test performances.

Since these tests have been established as reliable and valid instruments, they can be used to make informed decisions to enhance the development of this group of Native American children (DeBlassie & Franco, 1983; Meisels, 1991; NAEYC, 1988). An important concern generated by this study was the large number of children within the sample that, at this point in time, tested low in receptive English language vocabulary acquisition. This result was found to be independent of whether the children were bilingual or only English speakers. The Head Start sample also demonstrated average to above average abilities in other areas of development (i.e., perceptual, memory, quantitative). These areas need to be supported, especially since it has been noted in the literature that declines in Native American children's school performance are not noted until second grade and then progressively worsen (McShane, 1988; McShane & Plas, 1984).

Dunn and Dunn (1981) stated that since oral language is highly stressed in schools, facility in using standard English is widely recognized as a prerequisite to success in school, work, business and higher education. Several sources have suggested that development of children's ability to control their own cognitive processes is contingent upon mastery of their primary language (Anderson & Anderson, 1983; Cummins & Swain, 1986; Vygotsky, 1978). Based upon these sources and the test results, there are

several suggestions for intervention in this Native American community in order to promote acquisition of primary language skills, whether this be Crow or English.

Nurses and physicians are often the first and only professionals in contact with young Native American children and their families (Glascoe et al., 1990). They can use this opportunity to establish baseline developmental patterns of the children with standardized developmental testing and information from parents. Deviations from normal might include a pattern with low performance in perceptual, gross motor, quantitative, and memory areas. Rather than a low verbal score, deviations in verbal areas may be noted by stuttering, incomplete utterances, prolonged delays in response times, poor topic maintenance, and the need for frequent clarification and repetition (Fradd & Hallman, 1983). If these behaviors are noted by the parent during day-to-day interactions with their child, this would give further indications to evaluate for a verbal delay.

During routine well child exams, health care providers can emphasize the importance of parent-child verbal interaction in the language the parent is most comfortable speaking. Parents can be encouraged to read aloud, sing and play with their children. Bilingual parents can be reassured that their children will be able to make the

home-to-school language switch without causing academic problems (Cummins & Swain, 1986).

Nurses can work with tribal community leaders to support efforts to promote building of language skills and preliteracy in children. This may include promotion of programs such as Head Start and Even Start. Parenting classes that emphasize bringing back storytelling traditions, singing of traditional lullabies, awareness of the importance of positive verbalizations to children, and how to reinforce vocalization and verbalization in infants and children need to be supported.

Health care providers can also support tribal leaders in their efforts to provide more stable environments for children. Health care providers can keep tribal leaders informed of ongoing developmental trends in children and the incidence of problems that impact on development such as fetal alcohol syndrome and otitis media. This can give them objective data to provide to Congress for funding of programs to address problems or support ongoing successful programs.

Implications for Future Research

Since the study population was a small and specific group of Crow Head Start children, results are not generalizable to all Crow children or to other Native American children populations. It is recommended that this

study be replicated with a larger more representative sample, that testing be done either in the fall or in the spring, that a language dominance test be administered to more systematically clarify the terms monolingual and bilingual, and that an analysis of individual test items be compared for cross-cultural differences. The use of a trained bilingual tester may also increase information about the usefulness of these tests with Native American preschool children.

Because of this study, many ideas for further research were identified. A longitudinal study of a cohort of children would further verify the accuracy of these tests in identifying varying degrees of ability. A comparison of the results of these tests with the results of other developmental tests used in this population of children, such as the Batelle, would provide another source of concurrent validity. A study of the performance of the short form of the MSCA, the Kaufman version, with Native American preschool children may be helpful since health care providers are in need of tools that are valid and reliable and can be administered in a relatively short period of time.

Meisels (1991) stated that tests and measures represent only a portion of the factors that need to be considered when identifying children at risk for developmental delays. Attention must be given to the

environmental context of caregiving and the family's internal and external resources and stresses. Parenthood is a developmental and adaptive process and parental figures mediate the social and cultural influences on the child that play a unique role in the child's development (Meisels, 1991). It is only through an examination of the context of caregiving that a complete picture of a child's risk status will begin to emerge (Werner, 1986). Studies of teenage mother-child dyads have indicated that deficits in mother-child interaction, particularly in communicating with their children, directly lead to deficits in cognitive abilities in the children over time (McAnarney & Lawrence, 1993). Thus, a study of the influence on development of such factors as the quality of the home environment, parents' perceptions or knowledge of their child's development, and childrearing practices may be particularly useful in further understanding Native American children's developmental abilities.

Health care providers, educators, parents of Native American children, and Native American children would benefit from new knowledge regarding the use of standardized developmental screening tests with Native American children. More knowledge about the use of such tests in this population will help to distinguish true delays due to problems in development from those that are due to sociolinguistic incompatibility between the tester,

test and the testee. Finally, more knowledge about developmental testing in Native American populations will help ascertain not only the presence or absence of developmental competencies but will also help ascertain a Native American child's potential competencies and predict which interventions would most likely lead to the development and nurturance of such competencies over time. Providing culturally appropriate developmental screening, assessment and interventions will foster optimal development of the child's full range of abilities regardless of cultural background.

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APPENDICES

APPENDIX A

DATA COLLECTION INSTRUMENTS

Peabody Picture Vocabulary Test—Revised

INDIVIDUAL TEST RECORD

by LLOYD M. DUNN & LEOTA M. DUNN

FORM L

NAME ______ (last) ______ (first) ______ (middle initial) SEX: M F (circle)

HOME ADDRESS ______ HOME PHONE ______

SCHOOL ______ (or agency) GRADE PLACEMENT ______ (or education)

TEACHER ______ (or counselor) EXAMINER ______

LANGUAGE OF THE HOME: ☐ Standard English; ☐ Other ______ (specify foreign language or type of English dialect spoken)

Date & Age Data

	Year	Month	Day
Date of testing........			
Date of birth			
Chronological age..........			*

*If the number of days exceeds 15, add a month to the age (see Part I of the Manual).

Notice to Users

The PPVT–R is not intended for use in situations where truth-in-testing legislation stipulates that copies of test items and correct responses be distributed to subjects, parents, or the general public. Such disclosures may make the norms meaningless in future testing.

Reason for Testing (may include referral source and person authorizing testing)

______

______

______

______

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Obtained Test Scores

Raw score . . . .
(from page 4)

Standard score equivalent . . . .
(from Table 1, Appendix A)

Percentile rank . . . .
(from Table 3, Appendix A)

Stanine . . . .
(from Table 3, Appendix A)

Age equivalent . . . .
(from Table 4, Appendix A)

TRUE SCORE CONFIDENCE BAND

Mark the obtained standard score equivalent on the top scale. Then draw a heavy, straight, vertical line through it, and across the three scales. This line will extend through the three obtained deviation-type test scores. Depending upon the obtained standard score, shade in a band on both sides of the vertical line, using the schedule to the right. An example is given in Figure 1.4 of the Manual.

Obtained Standard Score	AREA TO SHADE Left of line	Right of line	Obtained Standard Score	AREA TO SHADE Left of line	Right of line
Below 65	0	14	100-109	7	7
65-74	2	12	110-114	8	6
75-84	4	10	115-124	10	4
85-89	6	8	125-134	12	2
90-99	7	7	135 & above	14	0

This shaded area provides a confidence band, the range of scores within which the subject's true scores can be expected to fall 68 times in 100. (These band width values are based on a median standard error of measurement (SEM) of + 7, with the band widths made increasingly asymmetrical toward the extremes to allow for *regression to the mean*.) See Part I of the Manual and the Technical Supplement for more precise values and a discussion of SEM confidence bands. Also see the Manual for a discussion of how to calculate the true score confidence band for the *age equivalent*.

40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160

1 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 99

1 2 3 4 5 6 7 8 9

EXTREMELY LOW SCORE | MODERATELY LOW SCORE | LOW | HIGH AVERAGE SCORE | MODERATELY HIGH SCORE | EXTREMELY HIGH SCORE

Data from Other Tests

Test		Date	Results
PPVT-R	FORM M		

Observations

Briefly describe the subject's test behavior, such as interest in task, quickness of response, signs of perseveration, work habits, etc.:

Performance Evaluation

This standardized test provides an *estimate* only of this individual's hearing vocabulary in Standard English, as compared with a cross-section of U.S.A. persons of the same age. Do you believe the performance of this subject represents fairly her or his true ability in this area? Yes No
If not, cite reasons such as rapport problems, poor testing situation, hearing or vision loss, visual-perceptual disorder, test too easy or too hard (automatic basal or ceiling used), etc.

Recommendations

Examiner's signature

FORM L	TEST ITEMS AND ABBREVIATED INSTRUCTIONS

Administering the TRAINING ITEMS

For most subjects under age 8: Use Plates A, B, and C. Administer as many training item series as necessary to secure three consecutive correct responses.
For most subjects age 8 and over: Use Plates D and E. Administer as many *training item series as necessary to secure two consecutive correct responses.*

Training Plate	INITIAL PRACTICE SERIES WORDS & KEYS	ADDITIONAL PRACTICE WORDS & KEYS Alternate Series X	Alternate Series Y	Alternate Series Z
A	doll (4)	fork (1)	table (2)	car (3)
B	man (2)	comb (3)	sock (4)	mouth (1)
C	swinging (3)	drinking (4)	walking (1)	climbing (2)
D	wheel (4)	zipper (2)	rope (1)	rake (3)
E	giant (1)	bride (3)	witch (4)	royal (2)

(Complete directions are given in Part I of the Manual.)

Administering the TEST ITEMS

Basal: Highest 8 consecutive correct responses
Ceiling: Lowest 8 consecutive responses containing 6 errors
Starting Point: For a subject assumed to be of average ability, find the person's age circled in the margin, and begin the test with that item. Otherwise consult Part I of the Manual for further instructions.
Recording Responses and Errors: Record the subject's response (1, 2, 3, or 4) for each item administered. For each error, draw an oblique line either through the plate number of the item missed, or through the geometric figure, as illustrated below:

32 envelope .... (2) 4 Ω or 32 envelope .... (2) 4 Ω

Every eighth figure is identical to help determine the basal and ceiling.

NOTE:
Ages in circles refer to the lowest age in a 6- or 12-month interval. For example, item 1 is the starting item for ages 2-6 through 3-5, and item 30 for ages 5-0 through 5-5. Use item 110 for ages 16-0 and over.

	Plate Number	Word	Key	Response	Error
● ●	1	bus	(4)	____	○
	2	hand	(1)	____	□
	3	bed	(3)	____	△
	4	tractor	(2)	____	Ω
	5	closet	(1)	____	♡
	6	snake	(4)	____	☆
	7	boat	(2)	____	◇
	8	tire	(3)	____	○
	9	cow	(1)	____	□
●	10	lamp	(4)	____	△
	11	drum	(3)	____	Ω
	12	knee	(4)	____	♡
	13	helicopter	(2)	____	☆
	14	elbow	(4)	____	◇
●	15	bandage	(4)	____	○
	16	feather	(1)	____	□
	17	empty	(3)	____	△
	18	fence	(4)	____	Ω
	19	accident	(2)	____	♡
●	20	net	(2)	____	☆
	21	tearing	(4)	____	◇
	22	sail	(1)	____	○
	23	measuring	(2)	____	□
	24	peeling	(3)	____	△
	25	cage	(1)	____	Ω
	26	tool	(4)	____	♡
	27	square	(4)	____	☆
	28	stretching	(1)	____	◇
	29	arrow	(2)	____	○
●	30	tying	(2)	____	□
	31	nest	(1)	____	△
	32	envelope	(2)	____	Ω
	33	hook	(3)	____	♡
	34	pasting	(4)	____	☆
●	35	patting	(1)	____	◇
	36	penguin	(1)	____	○
	37	sewing	(2)	____	□
	38	delivering	(1)	____	△
	39	diving	(2)	____	Ω
●	40	parachute	(3)	____	♡
	41	furry	(4)	____	☆
	42	vegetable	(4)	____	◇
	43	shoulder	(3)	____	○
	44	dripping	(2)	____	□
	45	claw	(4)	____	△
	46	decorated	(3)	____	Ω
	47	frame	(1)	____	♡
	48	forest	(3)	____	☆
	49	faucet	(2)	____	◇
●	50	group	(3)	____	○
	51	stem	(3)	____	□
	52	vase	(3)	____	△
	53	pedal	(1)	____	Ω
	54	capsule	(2)	____	♡
●	55	surprised	(4)	____	☆
	56	bark	(2)	____	◇
	57	mechanic	(2)	____	○
	58	tambourine	(1)	____	□
	59	disappointment	(4)	____	△
	60	awarding	(3)	____	Ω
	61	pitcher	(3)	____	♡
	62	reel	(1)	____	☆
	63	signal	(1)	____	◇
	64	trunk	(2)	____	○
●	65	human	(2)	____	□
	66	nostril	(1)	____	△
	67	disagreement	(1)	____	Ω
	68	exhausted	(2)	____	♡
	69	vine	(4)	____	☆
●	70	ceremony	(4)	____	◇
	71	casserole	(2)	____	○
	72	vehicle	(4)	____	□
	73	globe	(3)	____	△
	74	filing	(3)	____	Ω
	75	clamp	(2)	____	♡
	76	reptile	(2)	____	☆
	77	island	(1)	____	◇

Plate Number	Word	Key	Response	Error
78	spatula	(3)	____	○
79	cooperation	(4)	____	□
● 80	scalp	(4)	____	△
81	twig	(2)	____	Ω
82	weasel	(2)	____	♡
83	demolishing	(4)	____	☆
84	balcony	(1)	____	◇
● 85	locket	(1)	____	○
86	amazed	(3)	____	□
87	tubular	(1)	____	△
88	tusk	(1)	____	Ω
89	bolt	(3)	____	♡
● 90	communication	(4)	____	☆
91	carpenter	(2)	____	◇
92	isolation	(1)	____	○
93	inflated	(3)	____	□
94	coast	(3)	____	△
● 95	adjustable	(2)	____	Ω
96	fragile	(3)	____	♡
97	assaulting	(1)	____	☆
98	appliance	(1)	____	◇
99	pyramid	(4)	____	○
● 100	blazing	(1)	____	□
101	hoisting	(1)	____	△
102	arch	(4)	____	Ω
103	lecturing	(4)	____	♡
104	dilapidated	(4)	____	☆
● 105	contemplating	(2)	____	◇
106	canister	(1)	____	○
107	dissecting	(3)	____	□
108	link	(4)	____	△
109	solemn	(3)	____	Ω
● 110	archery	(2)	____	♡
111	transparent	(3)	____	☆
112	husk	(1)	____	◇
113	utensil	(2)	____	○
114	citrus	(3)	____	□
115	pedestrian	(2)	____	△
116	parallelogram	(1)	____	Ω
117	slumbering	(3)	____	♡
118	peninsula	(4)	____	☆
119	upholstery	(2)	____	◇
120	barricade	(4)	____	○
121	quartet	(4)	____	□
122	tranquil	(3)	____	△
123	abrasive	(1)	____	Ω
124	fatigued	(3)	____	♡
125	spherical	(2)	____	☆
126	syringe	(2)	____	◇
127	feline	(2)	____	○
128	arid	(4)	____	□
129	exterior	(1)	____	△
130	constellation	(4)	____	Ω
131	cornea	(2)	____	♡
132	mercantile	(1)	____	☆
133	ascending	(3)	____	◇
134	filtration	(1)	____	○
135	consuming	(4)	____	□
136	cascade	(4)	____	△
137	perpendicular	(3)	____	Ω
138	replenishing	(1)	____	♡
139	emission	(3)	____	☆
140	talon	(3)	____	◇
141	wrath	(3)	____	○
142	incandescent	(4)	____	□
143	arrogant	(2)	____	△
144	confiding	(3)	____	Ω
145	rhombus	(3)	____	♡
146	nautical	(3)	____	☆
147	tangent	(1)	____	◇
148	inclement	(4)	____	○
149	trajectory	(1)	____	□
150	fettered	(1)	____	△
151	waif	(3)	____	Ω
152	jubilant	(2)	____	♡
153	pilfering	(4)	____	☆
154	repose	(2)	____	◇
155	carrion	(3)	____	○
156	indigent	(2)	____	□
157	convex	(1)	____	△
158	emaciated	(2)	____	Ω
159	divergence	(4)	____	♡
160	dromedary	(2)	____	☆
161	embellishing	(2)	____	◇
162	entomologist	(3)	____	○
163	constrain	(1)	____	□
164	infirm	(1)	____	△
165	anthropoid	(3)	____	Ω
166	specter	(4)	____	♡
167	incertitude	(2)	____	☆
168	vitreous	(1)	____	◇
169	obelisk	(1)	____	○
170	embossed	(4)	____	□
171	ambulation	(2)	____	△
172	calyx	(2)	____	Ω
173	osculation	(3)	____	♡
174	cupola	(4)	____	☆
175	homunculus	(4)	____	◇

Calculating Raw Score

Ceiling item ____

*minus errors** ____

Raw score ____

*Count errors between highest basal and lowest ceiling only

Early Screening Inventory

S. J. Meisels and M. S. Wiske

Score Sheet For Four To Six Year Olds

Child's name ______________________ School ______________________

Date of screening ______ / ______ / ______ (year / month / day) Teacher ______________________

Date of birth ______ / ______ / ______ (year / month / day) Screener ______________________

Current age ______ / ______ (years / months) Sex: male __ female __ Parent questionnaire completed? yes __ no __

Complete all columns that apply

	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
I. Initial Screening Items						
A. Draw a Person (DAP)						
Let's play some drawing games. Draw a picture of a person - a boy, girl, man, or woman. (When the child seems finished:) **Are you finished?** [Ask child to write his/her name or other letters he/she knows. Note pencil grasp and hand preference in comments.]						
Draw a Person (5 or more parts)				1		
II. Visual-Motor/Adaptive						
A. Copy Forms						
Draw one just like this on your paper. (Repeat up to three times.)						
1. Copy ○				1		
2. Copy +				1		
3. Copy □				1		
4. Copy △				1		

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In Part III, C, Verbal Reasoning, opposite analogies 1, 3, and 4 and their scoring are from L. M. Terman & M. A. Merrill, Stanford-Binet Intelligence Scale (Boston: Houghton Mifflin, 1973), pp. 136, 148. Reprinted by permission of The Riverside Publishing Company.

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B. Visual Sequential Memory

Complete all columns that apply

	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
Now we're going to play a hiding game with these pictures. I'm going to hide this one (O) here and this one (+) here. (Lay down cards, from child's left to right, as shown below.) **Look at them carefully and remember where they are-- this one here** (pointing) **and this one here** (pointing). **Now I'll turn them over. Point to where this one is hiding.** (Hold up cards, one at a time, as shown in instruction manual.) (If second trials are needed:) **Now let's try it a different way.** (Repeat instructions.) [Put a check by correctly remembered figures.]						
1. Child: + O / Examiner (Repeat once, if necessary)				0		
2. Child: O + □ / Examiner — or, if fails — Child: + □ O / Examiner				1		

C. Block Building

Gate (screen)

gate

	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
Now we're going to build with blocks. First, I'm going to make a gate and when I finish I want to see if you can make one just like it. (Make gate behind screen. Remove screen.) **Now you make one just like mine.** (Give child 5 blocks.) (When child seems finished:) **Is this just like the one I made?**						
Gate (screen)				3		
or, if fails--Gate (imitate) **Watch how I make this one.** (Construct gate.) **Now you make one just like mine.** (Give child 5 blocks.) (When child seems finished:) **Is that just like the one I made?**						
Gate (imitate)				or 2		

II. C. Block Building (continued)

Complete all columns that apply

Item	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
bridge						
or, if fails--Bridge (screen) **Now I'm going to make a bridge.** (Make bridge behind screen.) **Take a good look at this one.** (Remove screen.) **Now you make one just like mine.** (Give child 3 blocks.) (When child seems finished:) **Is this just like the one I made?**						
Bridge (screen)				or 1		

III. Language and Cognition

A. Number Concept

Item	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
1. Counting **Count these blocks. Point to each one and count out loud so that I can hear you.** (Put 10 blocks in random order on an 8 1/2" by 11" piece of paper.)						
10 blocks				2		
or, if fails--5 blocks				or 1		
2. Altogether **How many are there altogether?** (If child begins counting:) **See if you can tell me without counting.**						
10 blocks or, if fails--5 blocks				1		

B. *Verbal Expression*

Now I have some things I want you to tell me about.
Tell me all about this. (Give child object.)
Tell me more about it. (Say no more than once for each object.)
(If child demonstrates without using words:) **Tell me with your words.**
(If child has not responded to four categories, ask, as needed:)

What do we call it? or **What is it?**
What color is it?
What shape is it? (except car)
What can you do with it?

[Score 2 points for each unsolicited correct response.
1 point for each response elicited with a specific question.]

(Maximum Score)	Name (2)	Color (2)	Shape (2)	Use (6)	Other (6)	Total Points Received
Ball						
Button						
Block						
Car						

Total score:

Points received (0-3):

0 - 5 = 0 pts;

6 -20 = 1 pt;

21-35 = 2 pts;

36+ = 3 pts.

Child's Spontaneous Responses (2 pts.)	Response Elicited by Screener (1 pt.)
Ball:	Ball:
Button:	Button:
Block:	Block:
Car:	Car:

C. Verbal Reasoning

Complete all columns that apply

	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
Now we are going to play some talking games. Listen carefully and finish what I want to say.						
1. **Brother is a boy; sister is a ____.**				1		
2. **A horse is big; a mouse is ____.**				1		
3. **A table is made of wood; a window of ____.**				1		
4. **A bird flies; a fish ____.**				1		
D. Auditory Sequential Memory **I'm going to say some numbers. Listen carefully and when I'm all through, say them right after me.** (Say the digits one second apart.)						
1. **9, 3** — **or, if fails--2, 6**				0		
2. **5, 1, 6** — **or, if fails--6, 2, 8**				1		
3. **2, 7, 4, 9** — **or, if fails--5, 9, 6, 3**				2		
IV. Gross Motor/Body Awareness A. Balance (2 of 3 attempts, on either foot) **Now we're going to play some standing up games. I want to see how long you can balance on one foot like this.** (Demonstrate.) **See if you can do it while I count to ten.** (Count at one second intervals.) (Try second foot if unsuccessful with first.)						
10 seconds				2		
or 5 seconds				or 1		

B. Imitate Movements

Complete all columns that apply

	Pass	Fail	Refuse	Total Points Possible	Total Points Received	Comments
Watch me carefully and make your arms do what mine do.						
Smooth: 2 or less corrected errors				2		
or Hesitant: more than 2 corrected errors and/or 2 or less uncorrected errors				or 1		
or More than 2 uncorrected errors				or 0		
C. Hop						
I want to see you hop five times on one foot like this. (Demonstrate. Repeat for the other foot. No more than three trials on each foot.)						
Five times on each foot				2		
or, Twice on either foot				or 1		
D. Skip						
Let me see you skip. (Demonstrate.)						
Skip: On both feet				2		
or, Skip: On one foot				or 1		

TOTAL SCREENING SCORE ____

Other Information: (Not scored)

A. Color-matching problems: no ____ yes ____ Describe: ____

____

(If child doesn't know the names of the colors, test for color blindness.)

B. Consonant errors: ____

Vowel errors: ____

Is speech intelligible? no ____

only in context ____

with articulation errors ____

yes ____

C. Uses complete sentences: yes ____ no ____

Uses incomplete sentences: yes ____ no ____

Uses sentences with language errors: yes ____ no ____

Screening Decision: Refer ____ Rescreen ____ OK ____

ESI Cutoff Scores

Age range	*Refer*	*Rescreen*	*OK*
4-0 to 4-5	<11	11-15	>15
4-6 to 4-11	<13	13-17	>17
5-0 to 5-5	<16	16-20	>20
5-6 to 5-11	<18	18-22	>22

Comments: ____

____

____

____

____

____

McCARTHY SCALES OF CHILDREN'S ABILITIES

Record Form

NAME____________________ AGE________ SEX________

HOME ADDRESS____________________

NAMES OF PARENTS OR GUARDIAN____________________

SCHOOL____________________ GRADE________

PLACE OF TESTING____________________ TESTED BY________

REFERRED BY____________________

MSCA PROFILE

Enter the 6 Scale Indexes on the appropriate lines below. Then circle the mark representing the Index for each Scale. Draw a line connecting the circles. Note that the values for GC are different from those for the other Scales.

SCALE INDEX	Verbal	Perceptual-Performance	Quantitative	General Cognitive	Memory	Motor
	____	____	____	____	____	____
				150 (+3SD)		
	78	78	78		78	78
				140		
	70	70	70	130 (+2SD)	70	70
				120		
	60	60	60	(+1SD)	60	60
				110		
	50	50	50	100 (Mean)	50	50
				90		
	40	40	40	(-1SD)	40	40
				80		
	30	30	30	70 (-2SD)	30	30
				60		
	22	22	22	(-3SD)	22	22
				50		

	Year	Month	Day
Date Tested	____	____	____
Date of Birth	____	____	____
Age	____	____	____

COMPOSITE RAW SCORES AND SCALE INDEXES

Enter the composite raw scores from the back cover. Obtain the composite raw score for GC by adding V + P + Q. Determine the corresponding Scale Indexes from Table 16. (See page 151 of manual for detailed directions.)

Scale	Composite Raw Score	Scale Index
Verbal (V)	____	____
Perceptual-Performance (P)	____	____
Quantitative (Q)	____	____
General Cognitive: Add composite raw scores V + P + Q	____	____ GCI
Memory (Mem)	____	____
Motor (Mot)	____	____

LATERALITY

(Enter information from Laterality Summary on page 5.)

Hand____________________

Eye____________________

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1. BLOCK BUILDING Discontinue after failure on both trials of 2 consecutive items

	Score Trial 1	Score Trial 2	Best Score
1. Tower	(0-3)	(0-3)	(0-3)
2. Chair	(0-2)	(0-2)	(0-2)
AGE 5 START → 3. Building	(0-2)	(0-2)	(0-2)
4. House	(0-3)	(0-3)	(0-3)
		Total	Max.=10

Test 1

2. PUZZLE SOLVING Discontinue after 3 consecutive failures

	Time Limit	Performance Time	Circle Obtained Score*									
1. Cat	30"		0	1								
2. Cow	30"		0	1								
AGE 5 START → 3. Carrot	30"		0	1	2							
4. Pear	60"	(0"-60")	0	1	2	3	4	5 (1"-30")				
5. Bear	90"	(0"-90")	0	1	2	3	4	5	6	7	8 (31"-45")	9 (1"-30")
6. Bird	120"	(0"-120")	0	1	2	3	4	5	6	7	8 (31"-60")	9 (1"-30")

*For items 4-6, bonus points for quick performance are given only if the child completes the puzzle perfectly

Total [Max 27] × ½ = Test 2 (Round half-scores up)

3. PICTORIAL MEMORY

Exposure Time	Response Time	Response	Score
Allow 10"	Allow 90"	Button ☐ Fork ☐ Paper Clip ☐ Horse ☐ Padlock ☐ Pencil ☐	

Test 3

4. WORD KNOWLEDGE Discontinue if score on Part I is less than 6. Discontinue Part II after 4 consecutive failures on that part.

PART I. PICTURE VOCABULARY Card	Response	Score
1. Apple ☐ Tree ☐ House ☐ Woman ☐ Cow ☐		(0-5)
2. Clock		(0-1)
3. Sailboat		(0-1)
4. Flower		(0-1)
5. Purse		(0-1)
	Total (Part I)	Max.=9

PART II. ORAL VOCABULARY Discontinue Part II after 4 consecutive failures	Response	Score (0-2)
AGE 5* START → 1. Towel		
2. Coat		
3. Tool		
4. Thread		
5. Factory		
6. Shrink		
7. Expert		
8. Month		
9. Concert		
10. Loyal		
	Total (Part II)	Max. 20

*For age 5, start at the indicated item. If items 1 and 2 of Part II are passed, give 9 points for Part I. (See manual.)

Part I + Part II = Test 4

5. NUMBER QUESTIONS *Discontinue after 4 consecutive failures.*

	Right Answer	Response	Score (0-1)
1. Ears	Two		
2. Noses	One		
3. Heads	One		
4. Toys	Three		
5. Balloons	Two		
6. Candy	Six		
7. Pennies	Seven		
8. Apples	Twelve		
9. Crayons	Six		
10. Ball	Eighty		
11. Secret	Four		
12. Cookies	Three		
Total			Max. = 12

× 2 = ____ Test 5

6. TAPPING SEQUENCE

	Tapping Order	Score: Trial 1	Score: Trial 2	Score: Trial 3	Best Score
1.	1 - 2 - 3 - 4	(0-2)	(0-2)	(0-2)	(0-2)

	Continue only if child plays item 1 correctly, and discontinue after 2 consecutive failures on items 2-8	Score (0-1)
2.	1 - 3 - 4	
3.	2 - 4 - 1	
4.	4 - 1 - 2 - 3	
5.	2 - 3 - 1 - 4	
6.	1 - 4 - 3 - 2 - 3	
7.	4 - 2 - 3 - 1 - 2	
8.	1 - 2 - 4 - 3 - 2 - 1	

Total ____ Test 6

7. VERBAL MEMORY *Discontinue Part I after 3 consecutive failures. If child earns 8 or more points (out of 30) on Part I, give Part II.*

PART I. WORDS AND SENTENCES	Score
1. toy - chair - light	(0-3)
2. doll - dark - coat	(0-3)
3. after - color - funny - today	(0-4)
4. around - because - under - never	(0-4)
Do NOT stress the underlined words in items 5 and 6.	
5. The boy said good-bye to his dog every morning before he went to school.	(0-7)
6. The girl tied a pretty pink ribbon on her doll before she went out.	(0-9)
Total (Part I)	Max. = 30

× ½ = ____ (Round half scores up) Test 7, Part I

PART II. STORY — Give Part II if child earned 8 or more points (out of 30) on Part I	Response	Score (0-1)
1. Term used for Bob		
2. Term used for the woman		
3. Term used for the letters		
4. Bob walking to store		
5. Bob saw woman		
6. Wind blew letters		
7. Bob shouted, "I'll get them for you!"		
8. Bob was careful		
9. Bob picked up letters		
10. Woman was happy		
11. Woman thanked Bob		
Total (Part II)		Max. = 11

Test 7, Part II

8. RIGHT-LEFT ORIENTATION

Administer only to children aged 5 and above *Discontinue after failure on 5 consecutive items.*

	Score (0-1)
1. Show me your right hand.	
2. Which is your left ear?	
*3. Touch your right eye with your left hand.	
4. Put your chin in your left hand.	
5. Cross your left knee over your right one.	
6. Show me Roger's left knee.	
7. Show me Roger's right elbow.	
*8. Show me Roger's left foot with your right hand.	
*9. Put your right hand on Roger's right shoulder.	
Total	Test 8

*Enter score for each part separately. *Both* parts must be failed for the item to be considered a failure.

9. LEG COORDINATION

Discontinue after item 5 if both trials of items 1-5 are failed

	Score Trial 1	Score Trial 2	Best Score	Notes
1. Walking backwards	(0-2)	(0-2)	(0-2)	
2. Walking on tiptoe	(0-2)	(0-2)	(0-2)	
3. Walking a straight line	(0-2)	(0-2)	(0-2)	
4. Standing on one foot	(0-2)	(0-2)	(0-2)	
5. Standing on other foot	(0-2)	(0-2)	(0-2)	
6. Skipping	(0-3)	(0-3)	(0-3)	
		Total	Test 9	

10. ARM COORDINATION

Give Part II even if Part I is failed Discontinue Part II *if all 3 trials of item 1, Part II, are failed* Give Part III even if Part II is failed

PART I. BALL BOUNCING

Trial 1 Number of Bounces	Trial 1 Score	Trial 2 Number of Bounces	Trial 2 Score	Best Score	*Preferred Hand*
(0-15)	(0-7)	(0-15)	(0-7)	(0-7)	R L B
				(Part I)	

Number of Bounces	Score
15	7
12-14	6
9-11	5
6-8	4
3-5	3
2	2
1	1
0	0

PART II. BEANBAG CATCH GAME
Give Part II even if Part I is *failed. Discontinue* Part II if all 3 trials of item 1 are failed.

	Trial	Score (0-1)
1. Both hands	1	
	2	
	3	
2. Preferred hand	1	
	2	
	3	
3. Other hand	1	
	2	
	3	
Total (Part II)		Max. = 9

Preferred Hand: R L

PART III. BEANBAG TARGET GAME
Give Part III even if Part II is failed.

	Trial	Score (0-2)
1. Preferred hand	1	
	2	
	3	
2. Other hand	1	
	2	
	3	
Total (Part III)		Max. = 12

Preferred Hand: R L

Part I + Part II + Part III = Test 10

11. IMITATIVE ACTION

	Score (0-1)	Eye Used
1. Cross feet		
2. Fold hands		
3. Twiddle thumbs		
4. Sight through tube		R L
Total	Test 11	

12. DRAW-A-DESIGN Discontinue after 3 consecutive failures.	Pass-Fail	Score	Preferred Hand
1. (circle)		(0-1)	R L B
2. (vertical line)		(0-1)	R L B
3. (horizontal line)		(0-1)	R L B
4. (right angle)		(0-2)	R L B
5. (star)		(0-2)	R L B
6. (overlapping circles)		(0-3)	R L B
7. (divided square)		(0-3)	R L B
8. (parallelogram)		(0-3)	R L B
9. (diamond in rectangle)		(0-3)	R L B
Total		Test 12	

13. DRAW-A-CHILD Administer only if child earned 1 or more points on Test 12	Score (0-2)	Preferred Hand	Child's Comments
1. Head		R L B	
2. Hair			
3. Eyes			
4. Nose			
5. Mouth			
6. Neck			
7. Trunk			
8. Arms and hands			
9. Attachment of arms			
10. Legs and feet			
Total	Test 13		

LATERALITY SUMMARY

HAND DOMINANCE				
Test 10, Part I	Ball bouncing	R	L	B
Test 10, Part II, item 2	Beanbag catch	R	L	
Test 10, Part III, item 1	Beanbag throw	R	L	
Tests 12 & 13, all items	Drawing	R	L	B
	Totals	R	L	B

HAND DOMINANCE
Check one: (See pages 148-149 of manual.)

- ☐ Dominance Established (Right-Handed)
- ☐ Dominance Established (Left-Handed)
- ☐ Dominance Not Established
- ☐ Not Scorable

EYE USED IN SIGHTING (Test 11, item 4)
Check one: (See page 149 of manual.)

- ☐ Right
- ☐ Left
- ☐ Not Scorable

14. NUMERICAL MEMORY

Discontinue Part I after failure on *both* trials of any item. If child earns 3 or more points on Part I, give Part II and discontinue after failure on *both* trials of any item.

PART I. FORWARD SERIES	Trial 1	Trial 2	Score (0-2)
1.	5-8	4-9	
2.	6-9-2	5-8-3	
3.	3-8-1-4	6-1-8-5	
4.	4-1-6-9-2	9-4-1-8-3	
5.	5-2-9-6-1-4	8-5-2-9-4-6	
6.	8-6-3-5-2-9-1	5-3-8-2-1-9-6	
		Total (Part I)	Max.=12

Test 14, Part I

PART II. BACKWARD SERIES	Trial 1	Trial 2	Score (0-2)
1.	9-6	4-1	
2.	1-8-3	2-5-8	
3.	5-2-4-9	6-1-8-3	
4.	1-6-3-8-5	6-9-5-2-8	
5.	4-9-6-2-1-5	3-8-1-6-2-9	
		Total (Part II)	Max. = 10

× 2 = Test 14, Part II

15. VERBAL FLUENCY

	Time Limit	Record Responses Verbatim	Score (0-9)
1. Things to eat Examples: bread potatoes	20"		
2. Animals Examples: cat bear	20"		
3. Things to wear Example: shoes	20"		
4. Things to ride Example: bus	20"		
		Total	

Test 15

16. COUNTING AND SORTING

If child passed 9 or more items on Test 5, give full credit on Test 16. Otherwise, administer Test 16 and discontinue after 4 consecutive failures.

	Score (0-1)
1. Takes 2 blocks	
2. Takes 3 *more* blocks	
3. Answer: 5	
4. Puts 2 blocks on each card	
5. Answer: 2	
6. Puts 5 blocks on each card	
7. Answer: 5	
8. Point: 2nd block from left	
9. Point: 4th block from right	
Total	

Test 16

17. OPPOSITE ANALOGIES

	Score (0-1)
1. The sun is *hot*, and ice is ______.	
2. I throw the ball *up*, and then it comes ______.	
Continue only if child answers at least one of items 1 and 2 correctly, and discontinue after 3 consecutive failures on items 3-9.	
3. An elephant is *big*, and a mouse is ______.	
4. Running is *fast*, and walking is ______.	
5. Cotton is *soft*, and rocks are ______.	
6. A lemon is *sour*, and candy is ______.	
7. Feathers are *light*, and stones are ______.	
8. Syrup is *thick*, and water is ______.	
9. Sandpaper is *rough*, and glass is ______.	
Total	Max. = 9

× 2 = ☐ Test 17

18. CONCEPTUAL GROUPING Discontinue after 4 consecutive failures.

	Number Right	Number Wrong	Right Minus Wrong	Score
1. Little, big				(0-1)
2. Red, yellow, blue				(0-1)
3. Square, round				(0-1)
4. Square blocks	(0-6)	(0-6)	(0-6)	(0-2)
5. Big yellow blocks	(0-2)	(0-10)	(0-2)	(0-2)
6. Big round red block				(0-1)
7. Small blue square				(0-1)
8. Large blue square				(0-1)
9. Large yellow circle and small yellow square				(0-2)
Total				Max. = 12

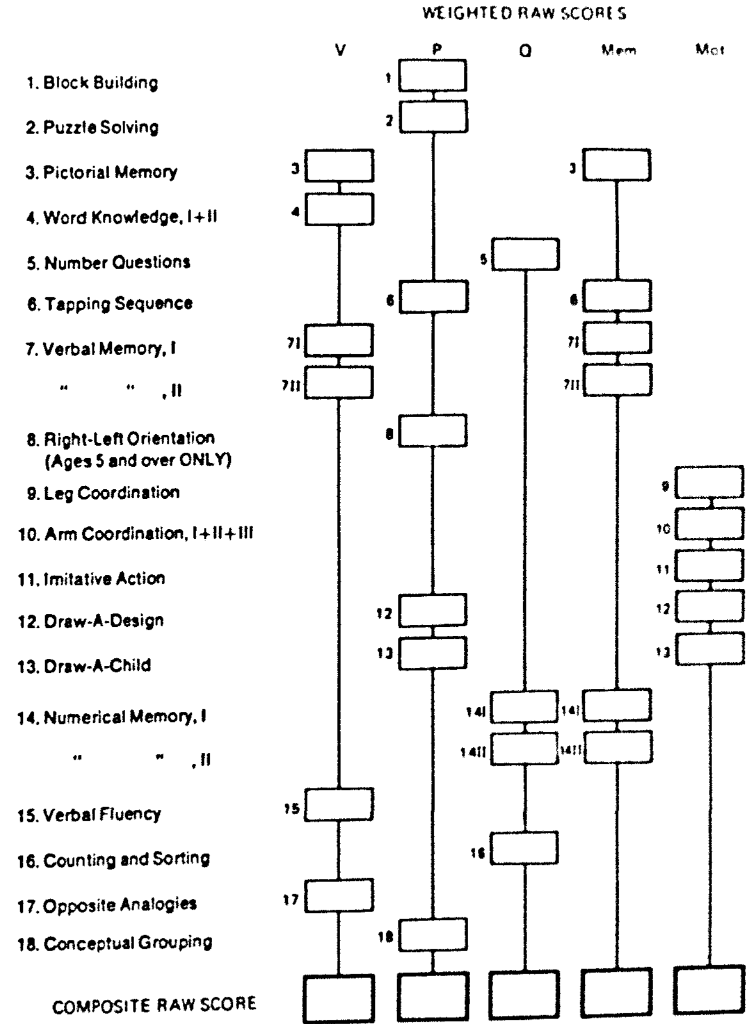
Test 18

NOTES:

COMPUTATION OF COMPOSITE RAW SCORES

1. Enter the weighted raw scores which are in the shaded boxes on pages 2-7 of the record form. For each test, enter the score in the box(es) bearing that test's number. (For example, the score for Test 3 is entered in 2 boxes.)
2. Sum the scores in each of the 5 columns. Enter the totals in the composite raw score boxes at the foot of the page.
3. Transfer the composite raw scores to the front cover. (Open the booklet and turn it over so that the front and back covers are side by side.) Enter the scores in the Composite Raw Score column in the box labeled "Composite Raw Scores and Scale Indexes."

(For more detailed directions on the completion of the record form, see Chapter 7 of manual.)



Name ______________________ Examiner ______________________ Date ______________

McCARTHY SCALES OF CHILDREN'S ABILITIES

Drawing Booklet

TEST 12. DRAW-A-DESIGN

TEST 13. DRAW-A-CHILD

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The Psychological Corporation 555 Academic Court San Antonio, Texas 78204

9-188624

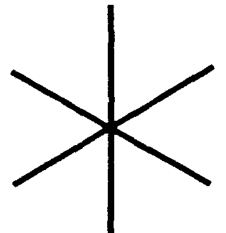
TEST 12 DRAW-A-DESIGN

1

3.

4.

5.



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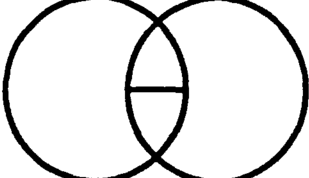

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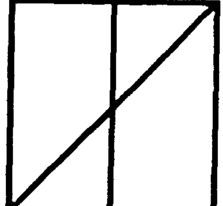

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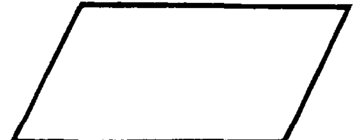
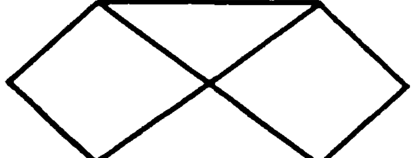




TEST 13 DRAW-A-CHILD

APPENDIX B

PERMISSION TO COLLECT DATA

MONTANA STATE UNIVERSITY
COLLEGE OF NURSING

UNIVERSITY HUMAN SUBJECTS COMMITTEE SUMMARY

Name of Proposal: Developmental Assessment and Parental Expectations of Native American Children

Name of Investigator/s: Jean N. Gullicks, Ph.D., R.N.; Joyce Hendricks, M.S., R.N., CPNP
(Circle one: undergraduate student/s, graduate student/s, (faculty member/s))

Faculty Advisor (if student research): ______

Date of College of Nursing Review: 4/29/91

Reviewed by:
(List College of Nursing reviewers involved by names and type of committee, e.g. J. Doe, Great Falls Extended Campus Committee)

Jan Buehler Billings Campus

Approved by:
Campus H.S.R. Committee Jan Buehler 5/24/91

Education Director Deborah [illegible] 5/24/91

Brief Description of Subjects (age, sex, health status, etc.)
(To Be Completed by the Investigator/s)

Native American children between the ages of two and six years.
Child's caregiver who accompanies them to preschool or well-child clinic.
Subjects will be residing in Yellowstone County and understand English.
Health of the subjects will not be considered as selection criteria.

(Description continued)
the children will be given the McCarthy Scales and the ESI. The caregivers in the third group will be given the Caldwell Home Inventory Parent Questionnaire and the Parent Expectations Inventory. The subjects will not be given all three instruments to minimize subject fatigue and the halo effect.

Assessment of the children will be done in the well-child clinic or preschool according to the standardized procedures for each instrument. Caregivers will complete the instruments in the clinic either verbally or in writing depending on their ability. If the caregiver is unable to complete the questionnaires at that time, they will be mailed for completion.

Signed consent forms will be kept separate from the questionnaires in a locked file for a period of five years. Files are maintained in the College of Nursing. Researchers on this project will have access to the file.

Tools to be used in this study are in circulation for wide use. Upon purchase of the tools, permission was given by the individual companies to use the tools for data collection. Manuals are included with each tool, specifying correct application for each instrument.

Brief Description of Procedure (what is to be asked of or done to subjects)
(To Be Completed by the Investigator/s)

After permission from the caregivers has been obtained, children and caregivers will be randomly assigned to one of three groups. In the first group, the children will be given the Peabody Picture Vocabulary Test and the McCarthy Scales. The caregivers in this group will be given the Early Screening Inventory Parent Questionnaire and the Caldwell Home Inventory Parent Questionnaire. In the second group, the children will be given the PPVT and the ESI. The caregivers in the second group will be given the ESI Parent Questionnaire and the Parent Expectations Inventory. In the third group (over

[X] Exempt Under Federal Reg. 45 CFR 46
46.101 (2) (b) 46.404 & 46.408.
(Insert number and letter as appropriate)

OR

[ ] Questionable or Ruled Not Exempt Under Federal Reg. 45 CFR 46

*Proposal sent to College of Nursing Dean for Review
on ______________________

September 24, 1991

TO: Stephen Guggenheim, Chair
Human Subjects Committee

FR: Jean N. Gullicks and Joyce Hendricks, College of Nursing; and
Molly Malone, Graduate Student, College of Nursing

RE: Developmental Assessment and Parental Expectations of Native American Children

In regard to the above project and in reply to your letter dated June 21, 1991, the following changes in procedure and subjects will be made:

1. Description of subjects (page 1 of Form B): In addition to subjects residing in Yellowstone County, subjects residing in Big Horn County will also be included. All other factors pertaining to subjects will remain the same.
2. Description of procedure (page 2 of Form B): Caregivers living in Big Horn County may complete their questionnaires either verbally or in writing at their home since most of the children living in Big Horn County are bussed to preschool. Caregivers will be contacted by the researchers through the local preschool and asked for their consent to participate in the study. The researcher will then visit their home where the questionnaires will be administered. Children with signed consents from their caregivers will be tested at the preschool.
3. The names of the children and their caregivers will not be used on the tools. Each will be assigned a code number. The identifying code will be maintained in a locked file at the College of Nursing.

Respectfully submitted,

Jean N. Gullicks

Jean N. Gullicks, Ph.D., R.N.

Joyce Hendricks

Joyce Hendricks, M.S., R.N., CPNP

Molly Malone RN

Molly Malone, R.N.

Montana State University
Bozeman, Montana 59717

Office of the Vice President for Research

Research and Development (406) 994-2891
Grants and Contracts (406) 994-2381

October 8, 1991

TO: Jean N. Gullicks and Joyce Hendricks
College of Nursing

FR: Stephen Guggenheim, Chair
Human Subjects Committee

RE: **DEVELOPMENTAL ASSESSMENT AND PARENTAL EXPECTATIONS OF NATIVE AMERICAN CHILDREN**

The above project/proposal was reviewed by the MSU Human Subjects Committee (HSC) on June 20, 1991, and approved as submitted.

When the project/proposal is activated, please remember that you should give copies of the consent forms to the subjects as well as keeping a copy in your records. You should also report any injuries or other adverse effects that occur during these studies to the HSC. If the procedures described in the application form or consent form are changed, these changes should be reported to the HSC.

If the HSC can be of further assistance or provide additional information, please feel free to contact us.

dj

College of Nursing

Billings Campus
EMC Campus Box 574
Billings, Montana 59101

Telephone 406-657-2912
FAX 406-657-1715

February 12, 1992

TO: College of Nursing
Human Subjects Review

FROM: Jean N. Gullicks, Ph.D., R.N.

Molly Malone has permission to use selected data from the research study on the use of developmental screening tests with Native American children and their primary caregivers for the purpose of secondary analysis. She will be examining accuracy of three developmental tests in detecting delays in this population of children.

At the end of the study, and after a period of time adequate for her to publish the results, the data will be properly disposed. A year is a customary time frame for such efforts. Since I will be second author on the student's publication, the data are protected.

Please be aware that this study is funded by a College of Nursing Block Grant. That project has approval from Montana State University Human Subjects Committee. Secondary analyses are exempt as long as no identifiers are present, as in the case of Ms. Malone's research.

College of Nursing

Billings Campus
EMC Campus Box 574
Billings, Montana 59101

Telephone 406-657-2912
FAX 406-657-1715

Date: April 3, 1992

To: Human Subjects Committee

Regarding: The proposal entitled: "The Use of Selected Developmental Screening Tests with NA children and their Primary Caregivers." Submitted by Maureen Malone, Jean Gullicks, and Joyce Hendricks.

Proposed Change: The caregivers instruments will be changed from the Early Screening Inventory Parent Questionnaire (Meisels et al. 1984), the Caldwell Home Inventory Parent Questionnaire (Bradley & Caldwell, 1979), and the Parent Expectations Inventory (Gullicks, 1989) to:

1. The Caldwell Home Inventory Parent Questionnaire (Bradley & Caldwell, 1979)
2. The Denver Prescreening Developmental Questionnaire Revised (Frankenburg, Van Doornick, & Liddell, 1986).

Both questionnaires will be administered to all caregivers. The time allotted will be 45 minutes. There will be no change in the administration of the tool.

College of Nursing

Sherrick Hall
Bozeman, MT 59717-0356

Telephone 406-994-3783
FAX 406-994-6020

May 28, 1992

TO: Maureen Malone
Graduate Student

FR: Julie Johnson
Associate Dean

RE: Human Subjects Approval of Your Project

I am pleased to inform you that the Montana State University College of Nursing's Human Subjects Review Committee has approved the changes for your proposal, "The Use of Selected Developmental Screening Tests with NA Children and Their Primary Caregivers." These changes, as well as your proposal, were ruled exempt because they involve survey procedures and subjects cannot be identified. You may begin data collection at your convenience.

Best wishes for success with your research. Please contact me if you have questions or if I can be of further assistance.

JEJ/ko

cc: Jean Gullicks, Chair

Crow Country

CROW TRIBAL COUNCIL

P.O. Box 159
Crow Agency, MT 59022
(406) 638-2601

Clara Nomee, Madame Chairman
Joseph Pickett, Vice-Chairman
Blaine Small, Secretary
Sylvester Goes Ahead, Vice-Secretary

September 23, 1991

Dr. Kathy Long, Dean
Montana State University
School of Nursing
Bozeman, Montana

Dear Dr. Long:

Molly Malone is employed as a Public Health Nurse at the Crow Indian Health Service Hospital on the Crow Indian Reservation since 1978. Molly is also attending Montana State University in order to obtain a Masters Degree in Nursing.

Molly would like to request interview sessions with Crow Indian children ages two to six and their parents or primary caregivers. During these sessions the children will be given two nationally standardized developmental tests and their parents or caregivers will be asked to fill out a questinnaire to determine their expectations about their child's developmental abilities and behavior. These interview sessions will be part of Molly's educational requirements and will be developed into a final thesis project for future reference at Montana State University. The information obtained from these sessions will help determine whether these tests and questionnaires can be used by educators and health care providers to accurately assess developmental delays or risk factors for delays in Crow Indian children.

The Crow Tribe has agreed to the requested interview sessions by Molly Malone. Molly has the understanding that all human rights will be protected. The Health Services Division of the Crow Indian Tribe will receive finalized copies of the thesis project.

Clara Nomee

Clara Nomee
Madame Chairperson

DEPARTMENT OF HEALTH & HUMAN SERVICES
PUBLIC HEALTH SERVICE - INDIAN HEALTH SERVICE

Memorandum

Refer to: PHN

Date · September 23, 1991

From Service Unit Director
Crow Service Unit

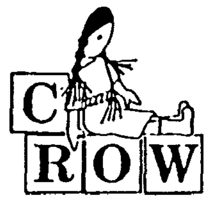
Subject Research/Developmental Assessement

To To Whom It May Concern:

This memo is to document that PHS Indian Hospital of Crow Agency, Montana has been informed of the research entitled Developmental Assessment and Parental Expectations of Native American Children that Molly Malone, PHN will be conducting as part of her Master of Nursing Program at Montana State University. Crow Hospital has no objections to this research being conducted and is satisfied that all human rights are being protected.

T. Doney

Tennyson Doney
Service Unit Director



HEAD START PROGRAM

Crow Tribe

P.O. Box 249 Crow Agency, Montana 59022 ☎ (406) 638-2697

September 30, 1991

Dr. Kathy Long
Dean, School of Nursing
Montana State University
Bozeman, MT

Dear Doctor Long:

This letter is to document that Project Head Start of Crow Agency, Montana, has been informed of the research entitled Developmental Assessment and Parental expectations of Native American Children that Molly Malone will be conducting as part of her Masters of Nursing Program at Montana State University. Project Head Start has no objections to this research being conducted at their premises and is satisfied that all human rights are being conducted.

Sincerely,

Nora A. Bird

Nora A. Bird
Director

"Building a better tomorrow for our children."

College of Nursing

Billings Campus
EMC Campus Box 574
Billings, Montana 59101

Telephone 406-657-2912
FAX 406-657-1715

Jean Gullicks, PhD, RN
Montana State University
College of Nursing
657-2912

Joyce Hendricks, MS, RN, CPNP
Montana State University
College of Nursing
657-2912

Molly Malone, RN
Graduate Student
Montana State University
College of Nursing
638-2626

I am being invited to answer questions for a research study. The questions will be about the child that I am caring for today. I will read the questions and answer them on paper or if I prefer, the questions will be read to me and I will answer them out loud. It will take about 45 minutes to answer all the questions.

The child that I am caring for will be checked with two tests (that are like games) to see how well he or she is growing and developing. If the child does not want to play, the testing will end.

I understand that I am free to withdraw my consent to be in the study at any time without affecting my care. Refusing to be in the study will not affect me in any way. If I do not take part in or if I withdraw from the study, I will continue to receive care. I understand that there are no risks to me or to the child. A benefit is that I will be told the results of the child's testing.

My name and the child's name will not be used in any way in this study. Each adult and each child will be given a number identification instead of using names. The information from the study may be reported as research. Any reported material will not identify me by name.

Questions and concerns about the study will be answered by the nurses listed above. This letter is for me to keep.

Jean Naismith Gullicks, PhD, RN

Joyce Hendricks, MS, RN, CPNP

Molly Malone, RN

College of Nursing

Billings Campus
EMC Campus Box 574
Billings, Montana 59101

Telephone 406-657-2912
FAX 406-657-1715

Participant's Statement

The study has been explained to me. I understand it and I give my permission to be in the study. I also give my permission to let the child that I am caring for be in the study. I have had the chance to ask questions. I understand that other questions that I may have will be answered by the nurses listed above.

____
Participant's Signature

____
Researcher or Assistant

APPENDIX C

DISTRIBUTION OF HEAD START SCORES

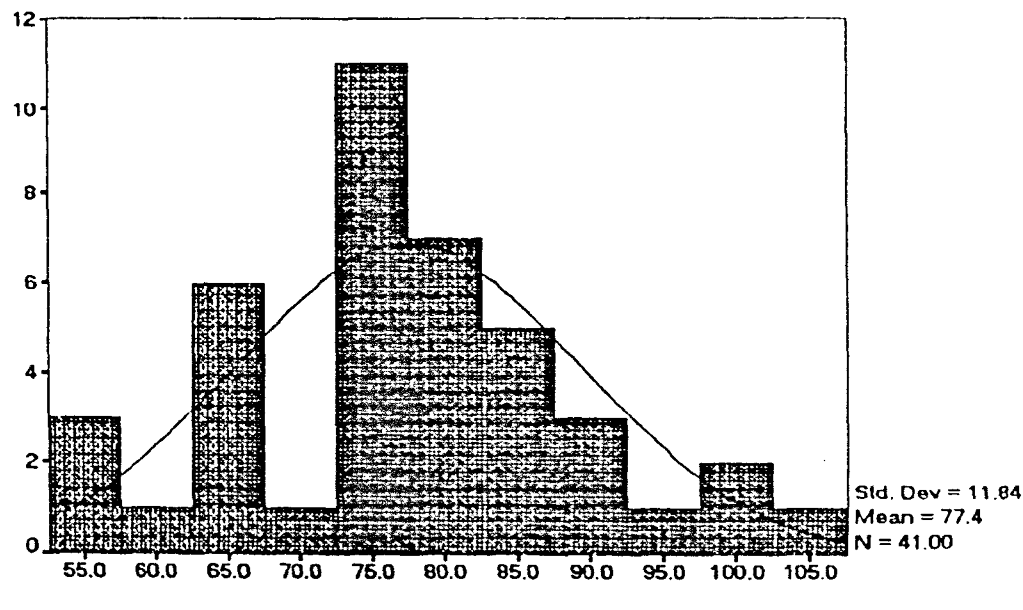


Figure 2. Frequency Distribution of Head Start PPVT-R Scores.

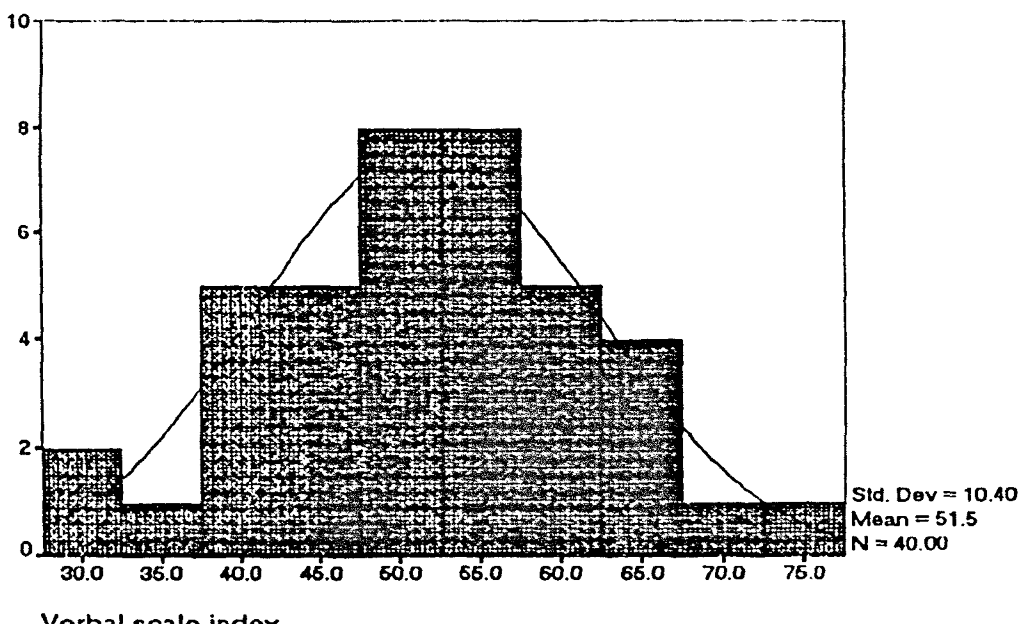


Figure 3. Frequency Distribution of Head Start Verbal Scale Scores (MSCA).

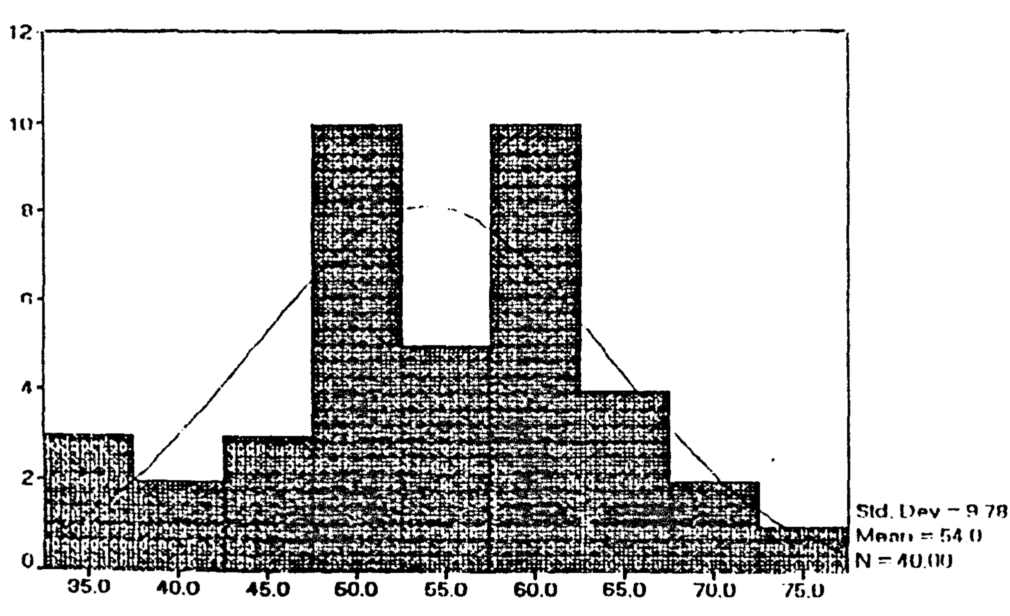


Figure 4. Frequency Distribution of Head Start Perceptual Scale Scores (MSCA).

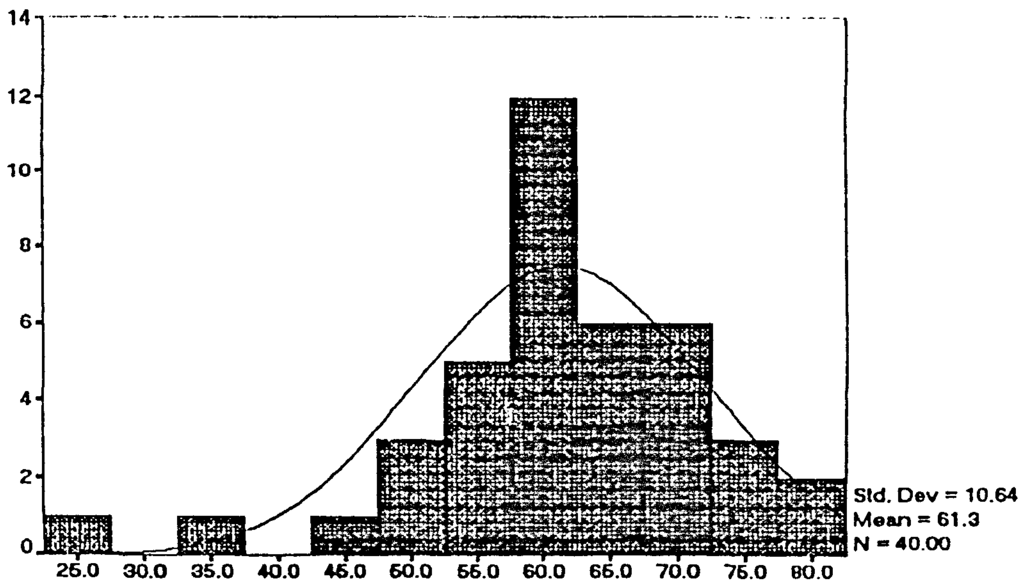


Figure 5. Frequency Distribution of Head Start Quantitative Scale Scores (MSCA).

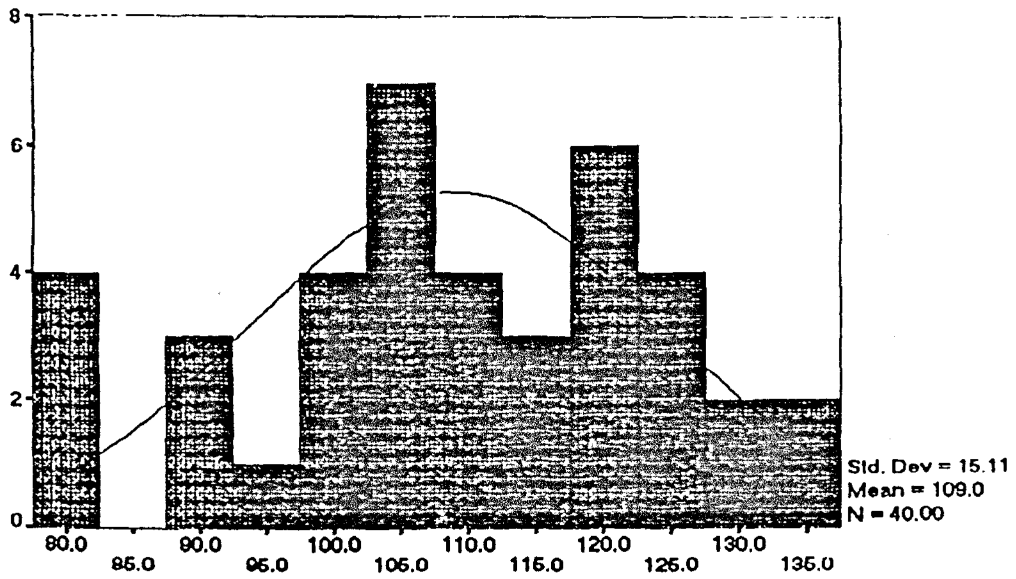


Figure 6. Frequency Distribution of Head Start General Cognitive Scale Scores (MSCA).

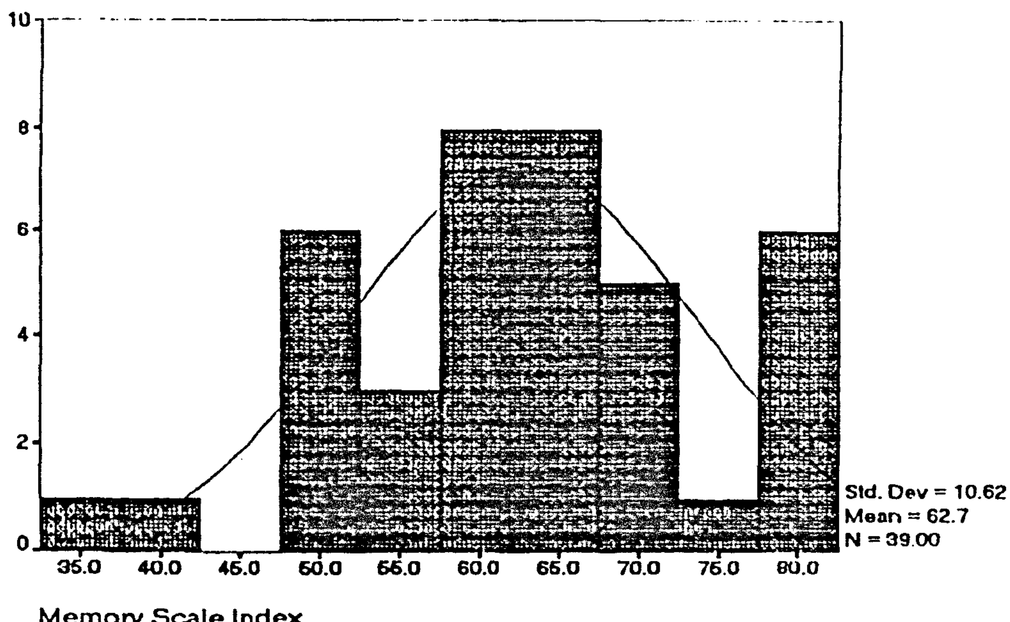


Figure 7. Frequency Distribution of Head Start Memory Scale Scores (MSCA).

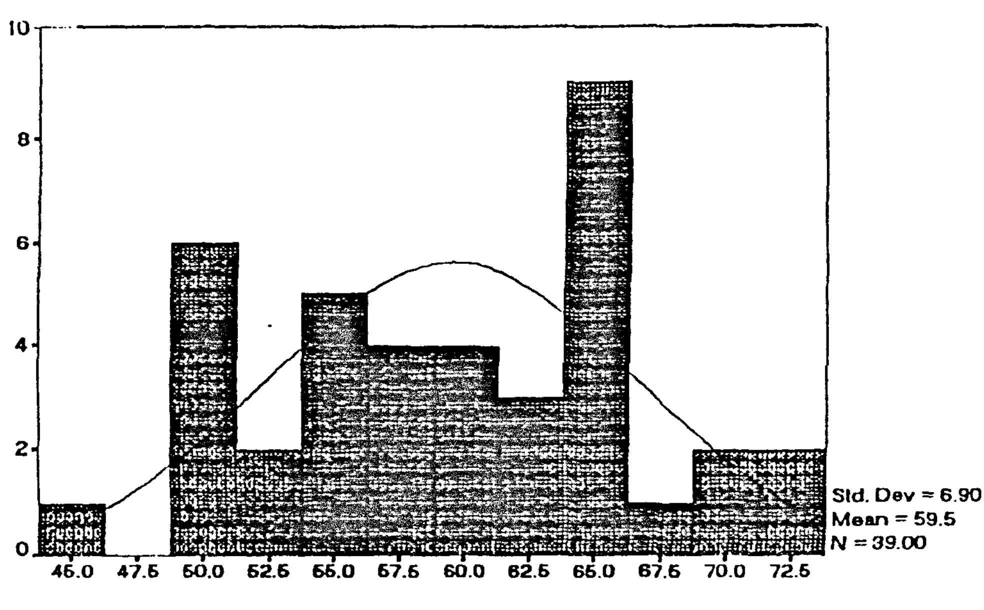


Figure 8. Frequency Distribution of Head Start Motor Scale Scores (MSCA).