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ABSTRACT

The purpose of this project was to administer the Motor Encoding Subtest of the Illinois Test of Psycholinguistic Abilities (IPTA) to a population of 50 American Indian students, and compare their scores with the established norms of the ITPA. Indian students with chronological ages 5-9 enrolled in the first 4 grades at the Fort Thompson Elementary Indian School were tested. The majority of the children failed to carry out the objective designed by the authors of the ITPA for the Motor Encoding Subtest. All of the students were able to demonstrate the functions of a toy hammer, a toy pitcher, a toy gun. It was only when they had to do the same with pictures that they had difficulty. Indian children are often bashful with strangers, and in a situation where they are asked to perform in front of a stranger, this bashfulness may be more pronounced. Three recommendations are presented--e.g., if the ITPA is going to be used as a tool to diagnose language disabilities, it is necessary to administer the whole test. One subtest can only provide minor information in this area. (FF)

# TESTING THE COGNITIVE MOTOR ABILITY OF INDIAN STUDENTS, USING AN I.T.P.A. SUBTEST

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A Project Paper Presented to

Dr. John Moss of the Graduate Faculty

Northern State College

Aberdeen, South Dakota

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In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Education

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by

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# CHAPTER I

## INTRODUCTION

There are various opinions that Indian students on the average do poorly on the various tests of intelligence and achievement which require a command of English but they do well on non-verbal performance tests. Also several investigators have demonstrated that children from homes in which English is spoken do better than those from homes where an Indian language is used. For example, Deissler proved this to be the case with Indians in South Dakota, and Purley who studied Indian students at Brigham Young University found that those for whom English was the primary language performed better than those who were bilingual on S C A T and A C E tests, and also maintained higher grade point average.[1]

Indian children do well up to the fourth grade level. When they reach the fourth grade they stagnate, and Purley suspects that the explanation lies in the fact that the texts in the primary grades are written in a carefully controlled "talking" vocabulary while upper grade texts shift to a "comprehension" vocabulary.[2]

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[1]Kenneth L. Deissler, "A Study of South Dakota Indian Achievement Problems," Journal of American Indian Education, 1:3 pp. 19-21, May 1962, p. 20.

[2]Ibid., p. 20.

This has also been the personal observation of the examiner over a period of five years. Due to this observation this investigator decided to administer one of the ITPA subtests (Motor Encoding) to try to determine whether or not the findings received from testing an Indian population agree with a similar group of non-Indians.

## THE PROBLEM

### Statement of the problem

It is the purpose of this project to administer the Motor Encoding Subtest of the Illinois Test of Psycho-linguistic Abilities to a population of fifty Indian students, and compare their scores with the established norms of the ITPA.

### Importance of the study

Many intelligence tests dwell heavily upon expressive language ability; therefore, Indian children who speak English as a second language may be unduly penalized due to this factor. Although the Indian students may have the cognitive ability, there may be the factor of their development in the English language which may affect their achievement level.

The Motor Encoding Subtest purports to assess the ability to express one's ideas in gestures. Students are required to pantomime responses rather than to give verbal responses to selected objects. This feature avoids the verbal language levels that could very well handicap the

student's performance, which may have negative effects on achievement and intelligence scores.

## METHODS AND PROCEDURES USED

Fifty Indian students with chronological ages five through nine enrolled in the first four grades at the Fort Thompson Elementary Indian School were tested.

The methods, materials, and procedures used were those outlined and provided in the Examiner's Manual, Experimental Edition, 1961. The method of scoring and recording followed the steps that are provided and outlined in the Examiner's Manual.

## DEFINITION OF TERMS USED

### Indian population

The Indian students attending grades one through four at the Fort Thompson Elementary Indian School are the subjects of this study.

### Fort Thompson Elementary Indian School

This is a school located on the Crow Creek Sioux Indian Reservation, administrated by the Bureau of Indian Affairs for students living on the reservation.

### ITPA

These initials stand for the Illinois Test of Psycholinguistic Abilities written by Samuel A. Kirk and James J. McCarthy.

Motor Encoding

This term refers to one of the nine subtests of the ITPA. In this subtest the children are asked to gesture instead of telling the function of objects in the pictures.

## DELIMITATION OF THE STUDY

This study was limited to the results of testing fifty-nine Indian students at the Fort Thompson Elementary Indian School.

The instrument of testing was the Motor Encoding Subtest of the ITPA.

## CHAPTER II

## REVIEW OF THE LITERATURE

The Illinois Test of Psycholinguistic Abilities is based on a model of communication processes created by Osgood, as an extension of Hull's learning theory.[3]

The ITPA in its development has undergone many changes and passed through numerous stages. The first stage of development considered was the development of a theoretical structure upon which the differential diagnosis was based. The second stage of development was implementing this theory with an operationally defined test. The third stage of development was to adapt these subtests in terms of clinical knowledge.[4] These preliminaries were followed by the standardization of the tests on a "normal" population as a reference point.

The "normal" population consisted of children chosen randomly from a list provided by the office of the school

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[3]Samuel A. Kirk and James J. McCarthy, "The ITPA-Approach to Differential Diagnosis," American Journal of Mental Deficiencies, 66:399-412, November, 1961, p. 399.

[4]Ibid., p. 399.

superintendent of Decatur, Illinois.[5] The Stanford-Binet 1937 revised edition was used to determine the IQ scores. Only students with IQ scores between 80 and 120 were chosen.[6]

Excluded from the standardization population were children of the Negroid race, and students attending parochial schools. The pre-school population tested was in most cases brothers and sisters of the school population tested.

Seven hundred children between the ages of two-and-a half and nine were used to establish norms for the experimental test battery of the 1961 Edition.[7] The 1968 Revised Edition extends the age limit to ten years of age.

Educators have not been satisfied with the testing tools available in the past. These tools have not provided for remediation, nor specified the areas in which the child is experiencing difficulty. The authors of the ITPA being fully aware of this situation developed a testing tool that is diagnostic rather than classificatory. The ITPA is designed to provide a profile of strengths and weaknesses which can be used in planning and providing remedial programs

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[5]James J. McCarthy and Samuel A. Kirk, Illinois Test of Psycholinguistic Abilities; Experimental Edition, Examiner's Manual. (Urbana, Illinois: University of Illinois Press, 1968), p. 19.

[6]Ibid., p. 19.

[7]Ibid., p. 19.

for children with deficits in psycholinguistic functions.[8]

The emphasis of the ITPA is on evaluating and assessing manifestations in the psycholinguistic field, in relating the assets and deficits to a behavioral model, and in transferring this type of behavior diagnosis to a remedial teaching situation.[9]

The structure of the 1961 Experimental Edition of the ITPA consists of a battery of nine different linguistic skills, categorized by sub-tests. Each sub-test is designed to assess specific components of psycholinguistic abilities. The sub-tests also provide information regarding which language skills or abilities are present in the decoding, association, or encoding processes on the representational or meaning level.[10] Three of the subtests attempt to diagnose the psycholinguistic abilities of the automatic sequential level which deal with the non-meaningful uses of symbols.

The ITPA then evaluates four broad areas of functioning 1) decoding (receptive functions), 2) encoding (expressive functions), 3) associations between encoding and decoding, and 4) memory processes.[11]

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[8]Paul Weener and Loren S. Barritt, Melvyn I. Semmel, "A Critical Evaluation of the Illinois Test of Psycholinguistic Abilities," Exceptional Children, 33:373-380, February, 1967, p. 373.

[9]Kirk, op. cit., p. 399. [10]McCarthy, op. cit., p. 19.

[11]Marianne Frostig and Phyllis Maslow, "Language Training: A Form of Ability Training," Journal of Learning Disabilities, 1:105-115, February, 1968, p. 109.

Decoding is the ability to understand the meaning of symbols, encoding is the ability to express ideas in symbols, and association is the ability to relate symbols on the basis of their meaning.

The Motor Encoding Subtest is the one dealt with in this study. This subtest taps the ability to express an idea through movement. The planning of a movement and the performance of it are both involved. A child may have perfect coordination but may have difficulty in carrying out the skill necessary for this subtest if he has not had previous exposure and experience with the object in the test. He may also lack imagination and the ability to conceptualize.

Children may also have difficulty in performing satisfactorily if they lack experiences in pantomiming an event which they have observed.

The literature surveyed indicates that the ITPA can provide valuable information toward helping young children in the area of language disabilities.

As a diagnostic tool the ITPA is more meaningful than are the tests of intelligence and achievement.[12] This diagnostic tool is of great value to the experienced clinician. It helps the clinician to check his judgment and

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[12] James J. McCarthy and Samuel A. Kirk, The Construction, Standardization and Statistical Characteristics of the Illinois Test of Psycholinguistic Abilities. (Urbana, Illinois: University of Illinois Press, 1963), p. 67.

also adds information to his informal assessment. It also provides the clinician with objective evidence which enables him to evaluate more adequately the behavior of individuals in sequencing, auditory memory, visual memory and visual motor coordination.[13]

As a testing instrument the ITPA has value in that it permits for a language training program to be set up. It helps to conceptualize the various skills which need to be developed by educational language training procedures, and it points to the methods which can be used to develop them. The ITPA has been used as a basis for several widely used and valuable programs for training language function.[14]

The ITPA also has some potential as a diagnostic tool with many types of handicapped children. Various studies have been done by Sievers, McCarthy, Olson, Bateman and Kass with cerebral palsy, aphasic, deaf, visually impaired and reading disability youngsters.[15]

The development of the ITPA has created new avenues to investigate speech problems and reading problems. It is essential for teachers to have a diagnostic tool that can help them determine by which sense modality a child can learn

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[13]Ibid., p. 67.

[14]Frostig, op. cit., p. 114.

[15]E.E. Ferrier, "An Investigation of the ITPA Performance of Children with Functional Defects in Articulation," Exceptional Children, 32:625-629, May, 1966, p. 625.

best. This is especially applicable to reading instruction. Often just one method is used to teach reading (phonic or sight). Thus, if children who are being taught to read by the phonic method are having difficulty in learning to read it may be because they have poor visual memory and some inability to discriminate letters.[16] The sight method, on the other hand, may place more emphasis on the ability to correctly match identical forms.[17]

Thus if a child is experiencing failure in reading under the phonic or sight method of instruction it is best to change methods, or use a combination of both. It is vitally important to teach children using the sense modality through which he learns best. Most children learn equally well through any receptive sense, but there is a small minority that does not. They are primarily dependent upon the visual or auditory modalities but not both. These children are the ones that need extra help.

It is important for the teacher to find out by trying various methods how a particular child learns best and capitalize on the one or several methods he can use best. The ITPA is a tool that can be used to diagnose the child for this purpose.

The ITPA is primarily designed to test language

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[16]Oliver L. Hurley, "Perceptual Integration and Reading Problems," Exceptional Children, 35:207-215, November, 1968, p. 214.

[17]Ibid., p. 214.

functions, but besides these functions it also taps perceptual, conceptual, and even sensory-motor abilities.[18] Therefore if a training program is based on the ITPA it would include training in some visual-motor, perceptual abilities and in thought processes, together with training in language abilities.

## CRITICISM

Weener, in his critical evaluation of the ITPA states that this is weak in its theoretical description of the levels of organization in language skills.[19] He also states that the ITPA is not clear in defining what psycholinguistic abilities are, and that some of the tests are only measuring general cognitive factors, ordering geometric shapes in the visual motor sequential subtest, when he feels these factors or skills are only tangentially related to psycholinguistic abilities.[20]

He also states that the reliability of the subtests is too low for adequate prediction and diagnosis for individual profiles, and if the test is to carry-out its stated purpose of differential diagnosis, the subtest reliabilities must be increased.[21]

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[18]Frostig, op. cit., p. 115.

[19]Weener, op. cit., p. 374.

[20]Ibid., p. 374.

[21]Ibid., p. 375.

Taking this criticism to apply to this paper it is well to remember that one subtest is not sufficient to give a specific diagnosis of a language ability. This subtest was chosen to show a possible difference between verbal and nonverbal performance, hopefully, in favor of the Indian students toward a better nonverbal expression of concepts.

# CHAPTER III

## ANALYSIS OF THE DATA

The Motor Encoding Subtest of the ITPA was administered to fifty-nine Indian children attending the Fort Thompson Elementary Indian School on March 25th and 26th of 1970.

Nine of the students had to be disqualified because their chronological age was above the established age norms of the ITPA. Fifty-one students met the requirements needed to acquire a sufficient sample of the population for this project.

The scores made by the Indian population on this subtest show that eighty per cent of the children tested below the equivalent language age norm as established in the ITPA.

The following table shows the subjects, raw score, chronological age, language age, and the difference in months between the chronological age and language age.

TABLE I

COMPARISON OF CHRONOLOGICAL AGE WITH CORRESPONDING LANGUAGE AGE FOR RAW SCORES MADE BY THE INDIAN STUDENTS

| Subject | Sex | Raw Score | Chronological Age | Language Age | Difference |
|---|---|---|---|---|---|
| 1 | F | 12 | 5.0 | 6.0 | 12 months above |
| 2 | F | 16 | 5.7 | 6.10 | 15 months above |
| 3 | F | 10 | 5.9 | 4.2 | 19 months below |
| 4 | F | 17 | 5.9 | 7.4 | 19 months above |
| 5 | F | 14 | 5.10 | 8.8 | 34 months above |
| 6 | M | 16 | 5.11 | 6.10 | 11 months above |
| 7 | F | 15 | 6.2 | 6.4 | 2 months above |
| 8 | F | 10 | 6.6 | 4.2 | 28 months above |
| 9 | F | 10 | 6.6 | 4.2 | 28 months below |
| 10 | F | 15 | 6.6 | 6.4 | 2 months below |
| 11 | M | 11 | 6.7 | 4.7 | 24 months below |
| 12 | M | 15 | 6.7 | 6.4 | 3 months below |
| 13 | F | 10 | 6.8 | 4.2 | 30 months below |
| 14 | F | 10 | 6.8 | 4.2 | 30 months below |
| 15 | M | 15 | 6.8 | 5.10 | 11 months below |
| 16 | M | 14 | 6.9 | 5.10 | 11 months below |
| 17 | F | 15 | 6.10 | 6.4 | 6 months below |
| 18 | M | 11 | 6.10 | 4.7 | 27 months below |
| 19 | F | 11 | 6.11 | 4.7 | 28 months below |

TABLE II

COMPARISON OF CHRONOLOGICAL AGE WITH CORRESPONDING LANGUAGE AGE FOR RAW SCORES MADE BY THE INDIAN STUDENTS

| Subject | Sex | Raw Score | Chronological Age | Language Age | Difference |
|---|---|---|---|---|---|
| 20 | M | 19 | 7.0 | 8.8 | 20 months above |
| 21 | M | 15 | 7.1 | 6.4 | 9 months below |
| 22 | M | 12 | 7.2 | 5.0 | 26 months below |
| 23 | M | 14 | 7.2 | 5.10 | 16 months below |
| 24 | F | 14 | 7.2 | 5.10 | 16 months below |
| 25 | M | 15 | 7.2 | 6.4 | 10 months below |
| 26 | M | 14 | 7.2 | 5.10 | 16 months below |
| 27 | M | 12 | 7.2 | 5.0 | 26 months below |
| 28 | F | 9 | 7.2 | 3.10 | 40 months below |
| 29 | F | 9 | 7.3 | 3.10 | 41 months below |
| 30 | F | 11 | 7.3 | 4.7 | 32 months below |
| 31 | M | 21 | 7.3 | 8.8 | 17 months above |
| 32 | M | 19 | 7.4 | 8.8 | 16 months above |
| 33 | M | 17 | 7.5 | 7.4 | 1 month below |
| 34 | F | 14 | 7.5 | 5.10 | 19 months below |
| 35 | M | 16 | 7.5 | 6.10 | 7 months below |
| 36 | M | 16 | 7.5 | 6.10 | 7 months below |
| 37 | F | 16 | 7.6 | 6.10 | 8 months below |
| 38 | F | 15 | 7.6 | 6.4 | 14 months below |

TABLE II (Continued)

COMPARISON OF CHRONOLOGICAL AGE WITH CORRESPONDING LANGUAGE AGE FOR RAW SCORES MADE BY THE INDIAN STUDENTS

| Subject | Sex | Raw Score | Chronological Age | Language Age | Difference |
|---|---|---|---|---|---|
| 39 | M | 15 | 7.7 | 6.4 | 15 months below |
| 40 | M | 17 | 7.10 | 7.4 | 6 months below |
| 41 | M | 16 | 7.10 | 6.10 | 13 months below |

TABLE III

COMPARISON OF CHRONOLOGICAL AGE WITH CORRESPONDING LANGUAGE AGE FOR RAW SCORES MADE BY THE INDIAN STUDENTS

| Subject | Sex | Raw Score | Chronological Age | Language Age | Difference |
|---|---|---|---|---|---|
| 42 | M | 14 | 8.1 | 5.10 | 27 months below |
| 43 | F | 17 | 8.2 | 7.4 | 10 months below |
| 44 | F | 17 | 8.2 | 7.4 | 10 months below |
| 45 | M | 17 | 8.2 | 7.4 | 10 months below |
| 46 | F | 15 | 8.6 | 6.4 | 26 months below |
| 47 | F | 15 | 8.6 | 6.4 | 26 months below |
| 48 | M | 18 | 8.7 | 7.11 | 19 months below |
| 49 | M | 21 | 8.8 | 8.8 | even |
| 50 | F | 14 | 8.8 | 5.10 | 34 months below |
| 51 | F | 10 | 8.8 | 4.2 | 54 months below |

## COMPARISON OF CHRONOLOGICAL AND LANGUAGE AGE

Only ten of the fifty-one students made scores equivalent to or better than the norming population. Three had language ages ranging from zero months to one year better than the standard ages, with seven making more than a one year difference from the standard including one student who ranged over two years above his chronological age.

Forty-one students missed their appropriate language ages according to their chronological ages on the standard scores. Two students were four years below standard, two were three years below, thirteen were at least two years behind, ten students missed by more than a year, with fourteen students missing the standard language age by less than a year.

These categories are better seen on the following chart which also shows a comparison of male and female subjects. Both the categories and percentage of each group is shown.

LANGUAGE AGE DISTRIBUTION COMPARED

WITH STANDARD NORMS FOR MALE AND FEMALE SUBJECTS

| | -4yrs. | -3yrs. | -2yrs. | -1yr. | 0 | +1yr. | +2yrs. | |
|---|---|---|---|---|---|---|---|---|
| Boys Number | 0 | 0 | 5 | 6 | 9 | 2 | 3 | |
| Boys Percent | 0% | 0% | 20% | 24% | 36% | 8% | 12% | |
| Girls Numbers | 2 | 2 | 8 | 4 | 5 | 1 | 3 | 1 |
| Girls Percent | 8% | 8% | 30% | 15% | 19% | 4% | 12% | 4% |

An equal number of boys and girls (5 each) made scores showing language ages equivalent to or better than the standard norms. The girls showed the greater range of scores with a girl scoring the highest of all students and several girls scoring much lower than any boys.

From this chart it can be seen that only twenty per cent of those tested made language ages corresponding to the standard norms for their ages, with the remaining eighty per cent missing the mark and some by quite a range.

# CHAPTER IV

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The majority of the children from this population failed in carrying out the objective designed by the authors of the ITPA for the Motor Encoding Subtest.

A series of factors could have been the cause for their poor performance. The first one to consider is the fact that the norms for the ITPA were set up with a very restricted population. A second factor to consider is verbal instruction for many children had difficulty understanding instruction. I observed that twenty-three of the fifty-nine children tested had difficulty understanding and carrying out the following instruction, "Show me what you should do with this." These children persisted in telling the examiner verbally instead of gesturing. One child in the first grade never understood the difference between the two terms. Other children would start to tell, but when reminded by the examiner to "show what you should do with it," they would. However there was no transfer of this instruction into the other items. The instructions had to be repeated everytime the student came to a new picture.

All of the students were able to demonstrate the functions of a toy hammer, a toy pitcher, a toy gun. It was only when they had to do the same with the pictures that they

had difficulty. It is possible that if they would have been able to handle, to feel, and to manipulate the rest of the objects in the same manner as they did the ones mentioned, their scores would have been satisfactory.

A third factor could be the inhibition of most of these children to express in gesture how an object is used. Indian children are often bashful with strangers, and in a situation where they are asked to perform in front of a stranger, this bashfulness may be more pronounced.

A large number of bashful signs were noticed when the children were instructed, "Show me what you do with this." Even when they understood what to do, they hesitated, as if expecting an explanation. If a child feels uneasy in a situation, the easiest thing to do is to hurry through what has to be done, often without much thinking involved.

It was observed that in two or three cases when an adult passed by, or a child was near, the student would not do anything, only smile. The student would resume with the testing when there was no one else present.

It was previously mentioned that the younger children do not seem to have the inhibitions of the older children. When these children were given a toy hammer and asked, "Show me what you should do with this," they automatically pounded on the desk or table; in contrast the older children would motion hurriedly what you should do with it.

The examiner felt that in many instances the children knew a lot more about the picture than they were expressing.

It was merely a matter of doing something so as to move on to the next picture.

The picture of the funnel stimulated a consistent stereotyped reaction by the majority of these children. It was always used for pouring gas.

A fourth factor could be that these children have had a lack of exposure to objects and the experience in using them. The following is an example of the above statement.

A week before this test was given, the orchestra from the high school in Chamberlain, South Dakota had been to their school to perform. The children immediately mentioned this when they saw the picture of the trombone, the flute, and the saxophone. They were able to gesture what they would do with them merely by remembering what the performers had done.

On the basis of the foregoing findings the following recommendations are made.

1. If the ITPA is going to be used as a tool to diagnose language disabilities, it is necessary to administer the whole test. One subtest can only provide minor information in this area.

2. Considering the subtest that was administered, and the children's scores, it is recommended that these children be given experiences in pantomiming, dramatizing, role playing, and other activities in which they will have to depend on gesturing to communicate.

3. These children may also lack experience and exposure to everyday activities and common objects. It is recommended that they be given experiences with common objects and activities.

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