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# LEITER AND RAVEN PERFORMANCE AND TEACHER RANKING: A CORRELATION STUDY WITH DEAF CHILDREN

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Historically, one of the primary questions raised in the consideration of intellectual ability of the deaf is whether the lack of hearing changed the rate of mental growth. The measurement of intelligence is often a direct function of how the test maker wishes to define intelligence. The limits range from Guilford's concepts (3) to the "g" factor of Spearman (4) at the other end of the continuum. Regardless of the theoretical formulations underlying the particular measure of intellectual ability employed, the most often used reason for administering such a test is to predict the likelihood of success in educational undertakings. It follows, then, that if one relates success in school with intelligence, as measured by IQ tests, the sensorially handicapped student will be at a serious disadvantage in succeeding in the regular program. Verbal or non-verbal tests normed on the general population, used on a child with any sensory deprivation violates one of the most fundamental assumptions of the testing philosophy; that of the subject being truly represented in the normative sample.

Anderson and Stevens (1) reported that 55% of the superintendents of schools for the deaf who responded to a questionnaire indicated the WISC performance scale is the preferred measure for acceptance into their programs. Fifty percent preferred the Nebraska Test of Learning Aptitude and 45% preferred the LIPS. The Raven Progressive Matrices (form not specified) was preferred by 7% of the respondents and was ranked next to last, surpassing only the House-Tree-Person Test.

It is contended that the utilization of non-verbal scales not standardized on the child with a sensory deficit places the tester in an indefensible position and also threatens to place the testee in jeopardy. The literature is full of misdiagnoses of mental retardation as the primary problem instead of the real sensory loss.

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One totally non-verbal test which is used extensively with the deaf is the Leiter International Performance Scale (LIPS). It is a mental age scale designed to evaluate subjects with mental ages between 2 and 18. The LIPS, however, is a very difficult test to administer, and it is expensive to purchase.

Another non-verbal test designed to evaluate all children from 5½ to 11 years of age is Raven's Coloured Progressive Matrices (CPM). This test is inexpensive, quick, and easy both to administer and score. The normative data, however, is presented in broad percentile bands and as a result is not very precise. There is ample precedent for using the CPM with non- or partially hearing children.

There are many correlational studies reported between the CPM and other non-verbal measures of ability. An extensive review of the literature, however, revealed no comparisons between the LIPS and the CPM with non-hearing children.

Birch, et al (2) concluded that the predictive validity of the LIPS is relatively high and that significant weight can be given to LIPS scores in predicting school success among deaf children. Their research revealed a correlation of .71 between the LIPS and school achievement (as measured by the Stanford Achievement Test) and a correlation of .86 between the LIPS and supervising teachers' estimates of the children's intelligence.

The purpose of this study was to investigate the relationship between the LIPS (Arthur Adaptation) and the CPM (revised order 1956) sets A, AB, and B. Not only is the relationship between the CPM and LIPS of interest, but it is also felt to be of value to investigate the predictive aspect of these scales in the deaf education program in which the S's were enrolled.

The sample for this study was drawn from the pupils who attend the special facility for hearing-impaired children in a central Florida county. The criterion for inclusion was the presence of severe to profound bilateral hearing loss as determined by audiometric evaluation (administered by a qualified audiologist). There were thirteen (13) children who met the criterion for this study; seven were boys, and six were girls. The age range was from 5½ years to 8 years 3 months, with a mean age of 7 years 3 months.

## PROCEDURE

Each S was individually administered the CPM and the LIPS. There were two qualified and experienced examiners employed: one administered the CPM to each S; the other administered the LIPS. The total number of correct responses on forms A, AB, and B of the CPM was recorded as the raw score for each subject. The mental age score earned by each S on the LIPS was converted to a decimal equivalent of the year-month notation and employed as the raw score. A Pearson product-moment correlation coefficient was computed for these data to test for the degree of relationship between these two variables.

During the time that the S's were being evaluated, the three teachers involved with the 13 S's were asked to rank the performance of each S in relation to every other S in terms of the objectives of the deaf education program. The teachers, in concert, arrived at a consensus which was used as the teachers' evaluation. The score each S earned on the CPM and on the LIPS was ranked and Spearman's rank-order coefficient of correlation was computed to compare each test with the teachers' evaluations as an estimate of the predictive accuracy of each scale.

## RESULTS

The correlation between the CPM and LIPS proved to be .65. This is significant at the .05 level. In Table I can be seen the age, the CPM raw score and the LIPS raw score as well as the coefficient of correlation between the CPM and the LIPS.

**TABLE 1**

**Chronological Ages of the Subjects and Raw Scores of the Two Variables**

| S# | CA | CPM raw score | LIPS raw score | |
|---|---|---|---|---|
| 1 | 6-7 | 12 | 4.0 | |
| 2 | 6-0 | 15 | 4.25 | |
| 3 | 7-7 | 11 | 5.0 | |
| 4 | 8-3 | 18 | 6.25 | |
| 5 | 8-2 | 21 | 7.0 | |
| 6 | 8-2 | 15 | 5.5 | $r_{xy} = .65$ |
| 7 | 8-3 | 18 | 3.5 | |
| 8 | 6-3 | 6 | 4.25 | $p = <.05$ |
| 9 | 8-3 | 15 | 4.5 | |
| 10 | 7-2 | 7 | 3.25 | |
| 11 | 8-1 | 8 | 3.5 | |
| 12 | 5-6 | 9 | 4.25 | |
| 13 | 7-9 | 11 | 4.75 | |

N = 13 CA = 7-3 $X = 12.769$ $Y = 4.615$

$SD_X = 4.658$ $SD_Y = 1.098$

Computation of the rank-order correlation between the CPM and teachers' evaluation yielded .59. With an N = 13, this figure is significant at the .05 level. The correlation coefficient between the ranking of the teachers' evaluation and the LIPS was also .59, and reached the same (.05) level of significance. (These findings are summarized in Table II.)

TABLE 2

**Correlations Between Teachers' Evaluations And The Two Variables**

| | LIPS | CPM |
|---|---|---|
| Teacher rank | .59 | .59 |

N = 13 p = <.05

## DISCUSSION

The relationship between the CPM and the LIPS in the context of this study appears to be a significant one, but it does not appear to be high enough to suggest that these two scales can be used interchangeably, for less than half (42%) of the variance of each scale is common. The ultimate decision regarding which test to employ would have to depend upon the use to which the test results were to be put.

When the results of the tests are to be employed as a preliminary estimate for initial placement or screening purposes or as an aid in the determination of mental retardation, perhaps the choice of which test to use could rest upon convenience, availability, preference, and training level of the tester. Cost factors, the time element, and level of training on the part of the examiner all militate toward the choice of the CPM. However, the CPM does not seem to lend itself to the type of test analysis and clinical interpretation that is possible with the LIPS. The LIPS is also useable with both younger and older subjects than is the CPM.

When the results of each scale were compared with the teacher evaluations, no differences were noted. These findings may be interpreted to signify that in the type of educational program from which the sample was drawn, that both scales predict the level of performance with equal accuracy at the .05 level of significance.

On the basis of this study the investigators conclude that for the purpose of rough screening and broad intellectual classification of the deaf the CPM appears to be as valid an instrument as the LIPS.

## REFERENCES

Anderson, R.M.; Stevens, G.D., "Policies and Procedures for Admission of Mentally Retarded Deaf Children to Residential Schools for the Deaf." *American Annals of the Deaf:* 115:30-36; January 1970.

Birch, J.R.; Stuckless, E.R.; Birch, J.W., "An Eleven Year Study of Predicting School Achievement in Young Deaf Children." *American Annals of the Deaf:* 108:236-40; March 1963.

Guilford, J.P., American Psychologist: 14:469-79; August 1959.

Spearman, C. " 'General Intelligence', objectively Determined and Measured." *American Journal of Psychology:* 15:201-92; 1904.