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AUTHOR Tannehill, Rhonda L.; Evans, Larry D.
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ABSTRACT

The relationship between the Wechsler Intelligence Scale for Children-III (WISC-III) and the Clinical Evaluation of Language Fundamentals-Revised (CELF-R) was investigated in 53 third graders from students in the 15 educational cooperatives across Arkansas. Additional information regarding race, academic achievement, and aptitude was gathered for each child. A Pearson product-moment was calculated to determine the relationship between the WISC-III and the CELF-R. The results indicated a statistically significant relationship between the Full Scale IQ of the WISC-III and the Total Language Score of the CELF-R ($r=0.724$, $p<0.001$). Statistically significant relationships were also found between the language achievement scores and the CELF-R, the Otis-Lennon School Abilities Test-6th Edition, and the Full Scale IQ, plus the various subtests of each measure. An analysis of variance indicated no significant differences in mean IQ scores across educational cooperatives. Results indicate a higher correlation between the WISC-III and CELF-R than had been found between the previous WISC-Revised and the CELF-R. (Contains 2 tables and 15 references.) (Author/SLD)

A Study of the WISC-III, CELF-R, Achievement, and Aptitude Among Public School Students in Arkansas

Rhonda L. Tannehill

Arkansas Children's Hospital

Larry D. Evans

University of Arkansas for the Medical Sciences

Running Head: CORRELATION BETWEEN THE WISC-III AND CELF-R

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Abstract

The relationship between the Wechsler Intelligence Scale for Children-III (WISC-III) and the Clinical Evaluation of Language Fundamentals-Revised (CELF-R) was investigated. Fifty-three third grade students from schools located in the fifteen educational cooperatives across Arkansas were administered the measures. Additional information regarding race, academic achievement, and aptitude was gathered for each child. A Pearson product-moment was calculated to determine the relationship between the WISC-III and the CELF-R. The results indicated a statistically significant relationship between the Full Scale IQ of the WISC-III and the Total Language Score of the CELF-R (r=.724, p<.001). Statistically significant relationships were also found between the language achievement scores and the CELF-R, the Otis-Lennon School Abilities Test-6th Ed. SAI and the Full Scale IQ, and the various subtests of each measure. An ANOVA indicated no significant differences in mean IQ scores across educational cooperatives. Results indicate a higher correlation between the WISC-III and CELF-R than had been found between the WISC-R and the CELF-R.

A Study of the WISC-III, CELF-R, Achievement, and Aptitude Among Public School Students in Arkansas

In meeting the requirements set forth in P.L. 94-142, the Arkansas Department of Education has developed regulations and guidelines for assessment and placement of handicapped children into special programs (Arkansas Department of Education, 1993). As stipulated by the regulations, after administration of the test measures, the results must be analyzed using the regression model if the child is being considered for placement in services for speech/language or a specific learning disability. The regression model requires the use of test correlations to correctly analyze test results. In appropriate correlations may result in analyses that are erroneous and lead to inappropriate programming for the child. Studies tend to use samples from referred populations. This may also lead to decisions that are inappropriate and unreliable. The purpose of this study is to examine the relationship of intelligence and language in a non-referred sample.

Two tests commonly used for placement are the Wechsler Intelligence Scale for Children-III (WISC-III) (Wechsler, 1991) and the Clinical Evaluation of Language Fundamentals-Revised (CELF-R) (Semel, Wiig, & Secord, 1987). Although previous studies had been conducted viewing the relationship between the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974) and the CELF-R ~~had been conducted~~, a search of the literature indicated no studies regarding the WISC-III and

the CELF-R. Since both the WISC-III and CELF-R are required for placement into language services or to rules out a language deficit when determining placement into other services, a correlation between the two instruments is required.

To establish the validity of the CELF-R, the CELF-R and the WISC-R were administered to 48 language learning disabled students (Semel, Wiig, & Secord, 1987). The CELF-R Total Language Score correlated higher with the Verbal IQ (r=40, p<.01) of the WISC-R than with the Performance IQ of the same test (r=.29, p<.05). The differences in correlations support the precept that the Verbal IQ and the Total Language Score measure similar constructs while the Performance IQ and the Total Language Score measure dissimilar constructs. The correlations between the Expressive Language with the Verbal IQ, Performance IQ, and Full Scale IQ were .39 (p<.01), .19, and .37 (p<.05), respectively. Correlations between the Receptive Language Score and the Verbal IQ, Performance IQ, and Full Scale IQ were .27, .28, and .32 (p<.05), respectively. The authors state that the lower correlations are acceptable since the two measures were created to measure different constructs. The correlations give credance to the use of the CELF-R in the identification of language learning disabled students.

The relationship of language and intelligence measures was further examined in a study of 56 students (Wiig & Secord, 1989). The sample consisted of 28 language learning disabled students and a matched sample of 28 normally achieving aged age-peers.

Both groups were administered the Test of Adolescent Language (TOAL) (Hammill, Brown, Larsen, & Widerholt, 1980), the Educational Abilities Series (EAS) (Thurstone, 1978), the Test of Language Competence-Expanded (TLC-E) (Wiig & Secord, 1989), and the WISC-R. The TLC-E was developed to assess the higher language ability of children and adolescents. The EAS is a district-wide, group-administered measure of educational ability. Comparisons were made comparing the learning disabled score on the TOAL, the WISC-R, and the EAS with the scores from the TLC-E subtests and composite score. The non-language learning disabled students' scores were compared for the TOAL, EAS, and TLC-E. No comparisons were made for this group on the WISC-R scores. The TLC-E composite score and WISC-R score correlations were .78 (Verbal IQ), .53 (Performance IQ), and .75 (Full Scale IQ). Correlation coefficients for the Verbal IQ and the subtests of the TLC-E ranged from .40 to .79. Coefficients for the Performance IQ and the TLC-E ranged from .18 to .45. For the Full Scale IQ and the subtests, the coefficients ranged from .38 to .71. A similar pattern of relationship was noted for the TLC-E and the WISC-R as was found between the CELF-R and the WISC-R when the sample is language learning disabled students.

Wiig and Secord (1989) conducted another study to examine the relationship of the TLC-E to other commonly used measures. A sample of 146 language learning disabled students and a matched sample of 146 non-language learning disabled students were administered the TLC-E, Level 1. In addition to the TLC-E, the

language learning disabled students were administered the WISC-R, the CELF-R, the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), and the Test of Language Development-2 (TOLD-2) (Newcomer & Hammill, 1988). Coefficients for the Verbal IQ and the TLC-E subtests ranged from .49 to .71. For the Performance IQ and the subtests, the range was from .07 to .12. Coefficients for the Full Scale IQ and the subtests ranged from .31 to .45. The coefficients for the TLC-E composite and the Verbal, Performance, Full Scale IQ's were .70, .12, .46, respectively. A similar pattern of correlations as found in the previously mentioned studies can be seen in this study.

Wiig and Secord (1992) conducted a relational study of the Test of Word Knowledge (TOWK) (Wiig & Secord, 1992) and the WISC-III. Fifty-two students (ages 8 to 12 years) were administered both measures within a one to four week time interval. The Full Scale IQ of the WISC-III correlated with the TOWK Receptive, Expressive, and Total scores at .73, .73, and .76 ($p<.01$), respectively.

A recent study examined the correlation between the PPVT-R and the WISC-III (Carvajal, Hayes, Miller, Wiebe, 1993). Both instruments were administered to 33 children enrolled in grades 3, 4, and 5. Correlation coefficients between the PPVT-R Standard Scores and the WISC-III Vocabulary subtest ranged from .60 to .76.

The studies focused on children from referred population samples in the examination of the correlation between

intelligence and language. The results indicated low to moderate correlations. Mehrens and Lehmann (1987) specify levels of reliability necessary for an instrument to be considered suitable. The suitability depends on (a) whether the instrument is to be used for making individual or group decisions; (b) whether the score ont he instrument is the principal determinant of the decision or one of many pieces of information to be used; (c) whether suitable alternative measures exist; (d) what type of reliability estimate is furnished. Mehrens and Lehmann suggest a guideline of .85 for measures used to make decisions about individuals and .65 for decisions about groups. When identifying reliability for test scores, Salvia and Ysseldyke (1981) suggest .60 as minimal for group performance, .80 for initial screening for individuals, and .90 for important decision making about individuals. With the guidelines mentioned here, the studies previously summarized have coefficients that are acceptable for decisions about group performance or screening situations.

METHOD

Subjects

Fifty-three third grade students from all educational cocperatives across Arkansas participated in this study. The schools within each cooperative were assigned numbers. These numbers were then chosen at random by a computer. Students within a chosen school were assigned numbers and the numbers chosen by a computer random numbers program. The number of

students chosen from each school was comparable to the strata of the school population within the state. One hundred students were originally chosen but time constraints required the reduction to 53. Alternate students were also chosen for each school district. Two children were not administered the CELF-R and were not included in the calculation of the correlation coefficients. Of the 53, 42 were Caucasian, 9 were African-American, and 2 were of unknown race. Twenty-six were males and 27 were females. Three students were recieving Special Education services (Specific Learning Disabilities) and 3 were in Speech/language services. Two children had previously been diagnosed as Attention Deficit Disordered but were recieving no special services. One child was attending a gifted and talented pull-out program. The ages of the children ranged from 8.315 to 10.389. Three children had been retained at least once.

The parents of the children typically had recieved a high school education, but ranged in educational level from sixth grade completion to completion of graduate school. Occupations of the parents ranged from student to medical doctor. The socioeconomic level was typically low to average middle income.

Permission to test the within the school was obtained from the school district superintendent. After permission to test within the school was obtained, permission forms were sent to the parents of each child to be tested. The permission forms requested information regarding the parents' occupations and educational levels and the number of siblings within the

household. Forms explained the purpose of the testing and the intended use of the results.

Data sheets per child were used at the time of test administration to gather information regarding Special Education and Speech/language services, previous testing for services, achievement test scores, grade retentions, date of birth, and race. The data sheets were later used to record scores from the CELF-R and WISC-III test administration.

Instruments

The Wechsler Intelligence Scale for Children-III (WISC-III) (Wechsler, 1991) and the Clinical Evaluation of Language Fundamentals-Revised (CELF-R) (Semel, Wiig, & Secord, 1987) were administered in a counter-balanced design with at least one week between administrations. The WISC-III is an individual test instrument designed to assess the general intellectual or g-intelligence of children ages 6 years to 16 years. The instrument yields standard scores for Verbal subtests and Performance subtests. A Verbal IQ score, Performance IQ score, and Full Scale IQ score are also obtained. The WISC-III tests were administered by a doctoral level school psychologist, a pre-doctoral school psychology intern, and a Master's level educational examiner.

The CELF-R is an individually administered test of language abilities. Standard scores may be obtained for Expressive and Receptive subtests as well as for Total Language. The CELF-R was

administered by Master's level speech/language pathologists and graduate students in speech/language pathology.

RESULTS AND DISCUSSION

Standard scores were determined for Verbal IQ, Performance IQ, and the Full Scale IQ on the WISC-III. For the CELF-R, standard scores for Receptive Language, Expressive Language, and Total Language were calculated. Correlations coefficients were calculated for the two tests using a Pearson product-moment. Results indicated statistically significant correlation coefficients between the Full Scale IQ and the Total Language Score at the .001 level. The Full Scale IQ also significantly correlated with the Expressive Language and Receptive Language Scores. The Total Language score significantly correlated with the Verbal IQ and the Performance IQ at the .001 level.

Insert Table One

The correlation coefficients calculated for the CELF-R and the WISC-III indicate a high degree of commonality between the two measures. The commonality appears to be most significant in the area of language and verbal skills as demonstrated by a non-referred population sample. The coefficient supports the use of the CELF-R and the WISC-III in making decisions for individual placement or screening for special services when the guidelines by Mehrens and Lehmann and by Salvia and Ysseldyke are applied.

An analysis of variance indicated no significant differences in the mean Full Scale IQ of the children across cooperatives (df=17, F=1.853, p<.060). The lowest Full Scale IQ score was 65 and the highest 126 with the mean Full Scale IQ being 97.14. Children across educational cooperatives tend to function intellectually with little variance.

An analysis of variance indicated no statistically significant difference in the mean Full Scale IQ of the children by race (df=1, F=1.735, p<.194). Children irregardless of race tended to have similar Full Scale IQ's across cooperatives.

The Otis-Lennon School Abilities Test-6th ed. (OLSAT) (Otis & Lennon, 1989) was administered to 14 of the children in the study A Pearson product-moment correlation was calculated for this group. The Otis-Lennon Total Score correlated significantly at the .01 level (r=.703). The Full Scale IQ appears to measure similar abilities as the Otis-Lennon Total score for this group of children.

Insert Table Two

SUMMARY

The Wechsler Intelligence Scale for Children-III and the Clinical Evaluation of Language Fundamentals-Revised were administered to 53 children randomly selected from fifteen educational cooperatives across Arkansas. Most children within the sample were from a non-referred population. Results

indicated a statistically significant relationship between the WISC-III and the CELF-R. The two tests appear to have significant overlap in the construct of language. According to the guidelines established by Salvia and Ysseldyke and by Mehrens and Lehmannn, both instruments have adequate reliability to be used for screening for special services and for decision making regarding individuals.

An ANOVA indicated no statistically significant differences in mean Full Scale IQ scores across cooperatives or across race. Children, whether Caucasian or African-American appear, to be functioning similarly in intelligence across cooperatives.

For 14 children, a Pearson product-moment correlation coefficient suggested that the Otis-Lennon Total Score and the Full Scale IQ score are measures of similar constructs. This should be regarded with caution since the sample for this calculation is very small.

Further research regarding the correlation between the WISC-III and the CELF-R or the CELF-III (in press) is suggested. Adequate research would allow for appropriate placement of children into Special Education services under the current guidelines of the Arkansas Department of Education and other states that use the regression model for placement into those services.

Table 1

Correlation Between the WISC-III and the CELF-R

	TL	VIQ	PIQ	FSIQ	RL	EL
TL	1.000	.729**	.548**	.724**	.912**	.914**
VIQ	.729**	1.000	.609**	.897**	.639**	.698**
PIQ	.548**	.610**	1.000	.887**	.512**	.486**
FSIQ	.724**	.897**	.887**	1.000	.667**	.656**
RL	.912**	.639**	.512**	.667**	1.000	.670**
EL	.914**	.698**	.486**	.656**	.670**	1.000

N=51 **P<.001

Table 2

Correlation Between the WISC-III and the Otis-Lennon

	VIQ	PIQ	FSIQ	OLNVSAI	OLVSAI	OLTOTAL
VIQ	1.000	.737*	.892**	.665*	.605	.692*
PIQ	.737*	1.000	.935**	.577	.708*	.703*
FSIQ	.892**	.935**	1.000	.619	.669*	.703*
NVSAI	.665*	.578	.619	1.000	.722*	.912**
VSAI	.605	.707*	.669*	.722*	1.000	.941*
TOTAL	.692*	.703*	.703*	.912**	.941**	1.000

N=14 *P<.01 **<.001

References

Carvajal, H., Hayes, J.E., Miller, H.R., & Wiebe, D.A. (1993). Comparisons of the vocabulary scores and IQs on the Wechsler Intelligence Scale for Children-III and the Peabody Picture Vocabulary Test-Revised. Perceptual and Motor Skills, 76, 28-30.

Dunn, L.M., & Dunn, L.M. (1981). Peabody Picture Vocabulary Test-Revised. Circle Pines, MN: American Guidance Services.

Hammill, D.D, Brown, V.L., Larsen, S.C., & Wiederholt, J.L. (1981). Test of Adolescent Language. Austin, TX: Pro-Ed.

Mehrens, W.A., & Lehmann, I.J. (1987). Using standardized tests in education (4th ed.). New York, NY: Longman.

Newcomer, P.L., & Hammill, D.D. (1988). Tests of Language Development-2nd Edition. Austin, TX: Pro-Ed.

Otis, A.S., & Lennon, R.T. (1989). Otis-Lennon School Abilities Test-6th Ed. San Antonio, TX: Psychological Corporation.

----(1993). Program standards and eligibility criteria for special education. Little Rock, AR: Arkansas Department of Education.

----(1993). Referral, placement, and appeal procedures for special education and related services. Little Rock, AR: Arkansas Department of Education.

Salvia, J., & Ysseldyke, J.E. (1981). Assessment in special and remedical education (2nd ed.). Boston, MA: Houghton Mifflin.

Semel, E., Wiig, E.H., & Secord, W. (1987). Clinical Evaluation of Language Fundamentals-Revised. San Antonio, TX: Psychological Corporation.

Thurston, T.G. (1978). Educational Abilities Series. Palo Alto, CA: Science Research Associates.

Wechsler, D. (1974). Wechsler Intelligence Scale for Children-Revised. San Antonio, TX: Psychological Corporation.

Wechsler, D. (1991). Wechsler Intelligence Scale for Children-III. San Antonio, TX: Psychological Corporation.

Wiig, E.H., & Secord, W. (1989). Test of Language Competence-Expanded. San Antonio, TX: Psychological Corporation.

Wiig, E.H., & Secord, W. (1992). Test of Word Knowledge. San Antonio, TX: Psychological Corporation.