

The Peabody Picture Vocabulary Test as A Measure of Intelligence in Children with Palatal Problems

CHARLES G. WATSON, Ph.D.
ROGER A. SEVERSON, Ph.D.

St. Cloud, Minnesota 56301

The Peabody Picture Vocabulary Test and the Wechsler Intelligence Scale for Children were administered to 33 children with palate problems. The correlations between PPVT and Wechsler IQ's ranged from .45 to .50 indicating that the Peabody is only a moderately good predictor of WISC scores in this population and suggesting that its utility in cleft palate children is limited. Additional data on the PPVT-WISC relationships are also presented and discussed.

The assessment of intellectual ability in cleft palate children presents special difficulties because of the subjects' problems with expression. For this reason, some efforts have been made to avoid administering intelligence tests which rely heavily on speech ability to these children.

The Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965a) has appeared to be a feasible alternative to traditional speech-oriented testing techniques. It is a 150-item, individually-administered, untimed test. Each item consists of four numbered pictures to which the subject responds by pointing to the correct picture when asked to, "Show me the (stimulus word)." Because it relies less on mechanical speech ability than other verbal intelligence tests, it has seemed to be particularly promising for use in speech and hearing clinics.

The test manual (Dunn, 1965b) reports a wide variety of validity coefficients. The results have varied tremendously from sample to sample. For example, correlations between the PPVT and Stanford-Binet have ranged from an unimpressive .43 (Burnett, 1965) for mentally retarded subjects to .92 (Lavitt, 1963) for a normal sample. Reported correlations between the PPVT and WISC Full Scale IQ have run from .30 for Kimbrell's (1960) retarded subjects to .84 for the crippled children studied by Moed, Wight, and James (1963). Pool and Brown (1970) have reported PPVT *vs.* WAIS-Doppelt correlations ranging from .45 for retarded subjects to .89 for psychiatric patients. These results indicate that the utility of the PPVT varies grossly from population to population and argue against its use in samples in which its relationship to traditional major intelligence tests is unknown.

Some empirical evidence supporting the use of the PPVT with speech/hearing impaired children has appeared. Hedger (1964), Saslow (1961) and

Dr. Watson is affiliated with the Veterans Administration Hospital, St. Cloud, Minnesota. Dr. Severson is affiliated with the University of Wisconsin, Madison, Wisconsin.

Scoggins (1960) have reported substantial correlations between the PPVT and four other intelligence tests in deaf, cerebral palsied, and functional misarticulation samples. However, the authors are unaware of specific information on the PPVT's relationship in such groups to the widely used Wechsler Intelligence Scales for Children (WISC). Therefore, in order to generate further information on the validity of the PPVT for use with speech/hearing disordered children, those with palatal clefts in particular, the authors investigated its relationship to WISC scores.

Method

The subjects consisted of 33 children, all patients at the University of Iowa Hospital Otolaryngology Service. They consisted of 15 boys and 18 girls; 17 with cleft palates, 15 with cleft lip and palate, and one with a short palate. The children ranged in age from six to 15 years with a mean age of 10.76 years ($S = 2.84$).

Each subject was given the WISC and PPVT (Form A) by the psychologist on the Otolaryngology Service. The WISC-PPVT data were evaluated for correlation coefficient size and standard errors of estimate to expose the size of the relationship between the two. Additionally, tests were run for the presence of constant errors and differences in variability between measures by use of paired-data t and F_{max} tests respectively.

Results

The results, which are summarized in Table 1, are generally discouraging. While they indicate that the PPVT is correlated with WISC scores, the r 's between the PPVT and WISC Verbal, Performance, and Full-Scale IQ were only .47, .45 and .50 respectively. Thus only a fourth of the WISC and PPVT variance is held in common by the two measures.

In order to provide a more meaningful evaluation of the relationships of the PPVT to WISC measures, the standard errors of estimate for the prediction of WISC Verbal, Performance, and Full-Scale IQ's from PPVT IQ's were calculated. As Table 1 indicates, they range from 13.7 to 15.4. Thus, the differences between PPVT IQ's and their WISC Verbal/Full-Scale counterparts were greater than 14 points in roughly one case out of three, and prediction was slightly weaker for Performance IQ scores. The median (absolute value) errors in the estimation of WISC Verbal, Performance and Full-Scale IQ's from PPVT IQ's were also calculated to determine the typical difference between PPVT and WISC IQ estimates. They were 12, 13 and 11 IQ points respectively.

As Table 1 indicates, the WISC and PPVT mean IQ's were generally similar; none of the PPVT-WISC mean differences was significant. Moreover, the variances in the four IQ's were similar, and the variance differences between the PPVT and WISC IQ's were not significantly different from one another.

Discussion

The modest validity coefficients and high standard errors of estimate cast doubt on the utility of the PPVT as an estimator of intellectual acuity among

TABLE 1. WISC and PPVT Means and Variances, and Statistics Describing PPVT-WISC Relationships

	mean	S	$\sigma x \cdot y$	PPVT-WISC relationships		
				r	t (means)	F _{max} (variances)
WISC-Verbal	93.94	15.7	13.7	.47**	1.03	1.04
WISC-Performance	100.88	17.3	15.4	.45**	1.65	1.26
WISC-Full-Scale	97.30	16.4	14.2	.50**	.52	1.13
PPVT	95.85	15.4				

** p < .01

cleft palate children. While the PPVT and WISC are significantly correlated, the size of the relationships does not recommend the PPVT's use as a WISC estimate. Thus, it provides further documentation for McWilliams's (1974) recommendation that the test be used only with great caution in cleft palate children. (In fact, the results suggest that, to a substantial degree, the WISC and PPVT are measures of different attributes in cleft palate children.) It is also worth noting that other studies (Watson & Klett, 1973; 1975) have compared the Wechsler and short intelligence tests and have reported more than double the common variance that appeared in the present study between the WISC and PPVT. Thus, it seems likely that better predictors can be found.

The results seem to complement earlier evidence (Watson & Klett, 1968; 1973; 1974; 1975) that intelligence tests which deemphasize verbal skills (such as the Porteus Mazes, D 48, Raven Progressive Matrices, Culture Fair Test, Revised Beta Examination, and the Quick Test) tend to be substantially less useful estimators of intelligence as a group than those relying more heavily on verbal expression. They suggest that the latter type of test may be a more fruitful measure of intellectual functioning even in speech/hearing-disordered persons.

Acknowledgment: The contributions of Teresa Kucala, Helen Buerkle, and Loretta Pogatchnik to this paper are gratefully acknowledged.

reprints: Charles G. Watson,
Associate Chief of Staff/Research,
Veterans Administration Hospital,
St. Cloud,
Minnesota 56301.

References

- BURNETT, A., Comparison of the PPVT, Wechsler-Bellevue and Stanford Binet on educable retardates, *Amer. J. Ment. Defic.*, 69, 712-715, 1965.
DUNN, L. M., *Expanded Manual for the Peabody Picture Vocabulary Test*. Minneapolis: American Guidance Service, 1965a.
DUNN, L. M., *Peabody Picture Vocabulary Test Manual*. Minneapolis: American Guidance Service, 1965b.
HEDGER, M. F., An analysis of three picture vocabulary tests for use with the deaf. In J. rosenstein and W. H. MacGintie *Research on the Psycholinguistic Behavior of Deaf Children*. CET research monogram, 1964.

- KIMBRELL, D. L., Comparison of the Peabody, WISC, and academic achievement scores among educable mental defectives, *Psychol. Reports*, 7, 502, 1960.
- LAVITT, J., Comparison of the Peabody Wechsler, Binet and California Test of intellectual ability among seventh to ninth grade pupils. Unpublished paper, Westfield, Mass: Westfield Public Schools, 1963.
- MCWILLIAMS, B. J., Clinical use of the Peabody Picture Vocabulary Test with cleft palate pre-schoolers, *Cleft Palate J.*, 11, 439-442, 1974.
- MOED, G., WIGHT, B. W., and JAMES, P., Interest correlations of the Wechsler Intelligence Scales for Children and two picture vocabulary tests, *Educ. Psychol. Measur.*, 23, 359-363, 1963.
- POOL, D. A., and BROWN, R., The Peabody Picture Vocabulary Test as a measure of general adult intelligence, *J. Consult. Clin. Psychol.*, 34, 8-11, 1970.
- SASLOW, H. L., *The comparability of the Peabody Picture Vocabulary Test and the Revised Stanford Binet, Form L-M with Cerebral Palsied Children*, Paper read at the American Psychological Association meeting, New York, August, 1961.
- SCOGGINS, B. J., *A comparative study of the Full-Range Picture Vocabulary Test and the Peabody Picture Vocabulary Test*. Unpublished Master's thesis, Nashville, Tennessee: Vanderbilt School of Medicine, 1960.
- WATSON, C. G., and KLETT, W. G., Prediction of WAIS IQ's from the Shipley-Hartford, the Army General Classification Test and the Revised Beta Examination, *J. Clin. Psychol.*, 24, 338-341, 1968.
- WATSON, C. G., and KLETT, W. G., Prediction of WAIS IQ's from Group Ability Tests, *J. Clin. Psychol.*, 29, 46-49, 1973.
- WATSON, C. G., and KLETT, W. G., Are nonverbal IQ tests adequate substitutes for the WAIS? *J. Clin. Psychol.*, 30, 55-57, 1974.
- WATSON, C. G., and KLETT, W. G., The Henmon-Nelson, Cardall-Miles, Slosson and Quick Tests as predictors of WAIS IQ, *J. Clin. Psychol.*, 31, 310-313, 1975.