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The purpose of this study was to further examine the reliability of the Peabody Picture Vocabulary Test (PPVT), a new instrument to measure hearing vocabulary so that a student's verbal intelligence may be inferred. A group testing procedure was utilized by reproducing the PPVT plates on 35 millimeter transparent slides and projecting them onto a 60 by 60 inch screen. A sample of 414 fourth-, fifth-, and sixth-grade pupils was tested twice with Form A and Form B, requiring one-half hour to administer separately and 1 hour when combined into one longer test. Alternate form reliability compared favorably with the PPVT manual, but an unforeseen difficulty in administering the test under group conditions was that ceiling scores had to be established individually for 161 pupils and basal scores for 15. Test-retest reliability coefficients ranged from .73 to .85. Combining the two forms into one test yielded test-retest reliability coefficients of .90, .88, and .84 for the fourth, fifth, and sixth grades respectively. Since reliability increased with the use of the combined test forms, psychometrists should give serious consideration to using both forms of the test as one longer instrument. Validity studies comparing group forms with individual forms are needed. (Author/LH)

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Reliability of a Group Form of the Peabody Picture Vocabulary Test

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ABSTRACT

The purpose of this study was to obtain needed additional information concerning the reliability of the PPVT. A group testing procedure was utilized by reproducing the plates of the PPVT on 35 millimeter transparent slides and projecting them onto a 60 × 60 inch screen. A sample of 414 fourth-, fifth-, and sixth-grade pupils was tested twice with Form A and twice with Form B. The time required to administer each separate form was one-half hour. The total testing time for both Form A and Form B when combined into one longer test was one hour. Alternate form reliability compared favorably with the manual. Test-retest reliability coefficients ranged from .73 to .85. Combining the two forms into a test twice as long yielded test-retest reliability coefficients of .90, .88 and .84 for the fourth, fifth and sixth grades respectively.

THE PEABODY Picture Vocabulary Test is a promising new instrument designed to measure hearing vocabulary in order that inferences may be made concerning a student's verbal intelligence or scholastic aptitude (1). The revised manual of the PPVT reports thirty-three studies which have investigated the validity of the test, but only eleven studies dealing with the instrument's reliability. Of these eleven studies of reliability, nine studies were based on children who were either retarded, physically handicapped, deaf, or emotionally disturbed. Only two studies were based on children placed in regular classrooms, that is, classrooms which were not remedial, accelerated, or special learning situations. Norris, Hottel and Brooks (4), using a sample of sixty fifth-grade pupils, found that no significant differences resulted from order of presentation, form, or type of administration. Ivanoff and Tempero (3) found an alternate form reliability coefficient of .75 based upon 150 seventh-grade pupils retested after two days.

Purposes

The purposes of this study were to obtain additional information concerning the reliability of the PPVT to supplement that data provided by the revised manual. Since there are two forms of the test, A and B, both alternate form reliability and test-retest reliability were investigated. Because the test is a quick screening device, taking about ten to fifteen minutes to administer, the feasibility of combining both Form A and Form B into one longer test was investigated to determine whether the gain in reliability was sufficient to justify increasing the testing time. Investigation was also made of the practice effect of subsequent retesting.

The study was based upon the test scores of 414 children in grades four, five, and six, and investigated:

1. the alternate form reliability between Form A and B,
2. the test-retest reliability for Form A and for Form B,
3. the test-retest reliability for Form A and Form B combined into one longer test,
4. the practice effect between Form A and Form B, between retests of the same form, and between retests of the combined forms.

Procedure

Although the PPVT is an individual test, research has shown that for regular classroom children, the test may be administered to a group with no significant differences in the scores when compared to scores based upon individual administrations (4). The group procedure employed in the study described above was adapted for use in this study. Certain changes were made in the experimental procedure, however, since it was found that 1) a more detailed set of test instructions enabled the pupils to comprehend the task more adequately, 2) a special answer sheet facilitated taking the test, and 3) many more basal and ceiling scores had to be established than were reported in the study by Norris, Hottel and Brooks (4).

For this study, the plates were reproduced on 35 millimeter transparent slides and projected onto a 60 × 60 inch screen. One examiner called out the stimulus word twice, and another examiner operated the projector. Several proctors assisted the pupils with following instructions and

marking a specially prepared answer sheet. By using this group procedure, a much larger sample was obtained than could have been possible if the test had been administered individually.

The tests were administered in class-size groups; five different classes were tested at the fourth-grade, fifth-grade and sixth-grade levels, making a total of fifteen classes. For each class, Forms A and B were administered consecutively with a brief rest period between tests. The same procedure was repeated after an interval of five weeks. The time required to administer each separate form was one-half hour. The total testing time for both Form A and Form B when combined into one longer test was one hour. All of the testing was conducted in the public schools of Albemarle County, Virginia.[2]

A reproduction of the answer sheet was drawn on the blackboard, and an examiner modified the instructions to say:

> We are going to show you some pictures. They will appear here on this screen. There will be four pictures on each slide: one, two, three, and four (pointing to the four appropriate positions). You see there are four blocks like this one (pointing) for each item on your answer sheet. Mr. Renzulli will say a word. I want you to look at the picture on the screen and place an X in the block which shows the picture that best tells the meaning of the words. Let's try some. (The stimulus words: *crib, fin,* and *butterfly* were then offered as examples A, B, and C.) Good, now we are going to show you some more pictures and Mr. Renzulli will say the words. I want you to look carefully at all four pictures and place an X over the position of the picture that best tells the meaning of the word. As we get further along, you will find that you aren't sure you know the word. But I want you to look carefully at all the pictures anyway and make the best choice you can. Remember to look at all the pictures. If you aren't sure, make a mark anyway. We're going to start with No. 29 in the first column. Put your finger on No. 29 so you'll know where to begin. (Proctors checked place for each pupil.) If your pencil breaks during the test, raise your hand immediately. Use your finger to keep the correct place.

The special answer sheet consisted of a series of squares numbered the same as the plates to be projected onto the screen. A facsimile of item 29 on the answer sheet follows:

29.

1	2
3	4

It may be seen that a child could readily mark an X in the numbered square. Because many more basals and ceilings had to be established individually than reported in the study by Norris, Hottel and Brooks, the test was begun with plate number 29 and continued through plate number 120. This unforeseen problem of establishing basals and ceilings is reported in Table 1 in the next section.

The data were processed by the Burroughs 5500 computer at the University of Virginia Computer Science Center. Product-moment correlation coefficients were computed from the raw scores. Practice effect between tests was inferred from differences in means determined by the one-tailed *t* test for significant differences between correlated means (2).

Findings

Beginning the test with plate number 29 and extending the test through plate number 120 still required an inordinate number of basals and ceilings to be established individually. This information is presented in Table 1. Alternate form reliabilities are presented in Table 2. Test-retest reliabilities are presented in Table 3. The results of the computations to investigate practice effect are presented in Table 4.

Table 1.—Number of Basal and Ceiling Scores Established Individually

	First Administration		Second Administration	
Grade 4 (N=158)	No Ceiling Form A: 0	Form B: 10	No Ceiling Form A: 2	Form B: 8
	No Basal Form A: 1	Form B: 2	No Basal Form A: 0	Form B: 2
Grade 5 (N=126)	No Ceiling Form A: 10	Form B: 21	No Ceiling Form A: 6	Form B: 6
	No Basal Form A: 2	Form B: 1	No Basal Form A: 0	Form B: 0
Grade 6 (N=130)	No Ceiling Form A: 19	Form B: 21	No Ceiling Form A: 20	Form B: 38
	No Basal Form A: 1	Form B: 3	No Basal Form A: 0	Form B: 3

Conclusions

An unforseen difficulty in administering the PPVT under experimental group procedures was

Table 2.—Alternate Form Reliability of the PPVT for Grades Four, Five and Six

	First Administration $r_{A_1 \cdot B_2}$	Second Administration $r_{A_2 \cdot B_2}$	
Grade 4 (N=158)---	.76	.75	(.74)*
Grade 5 (N=126)---	.71	.72	(.77)*
Grade 6 (N=130)---	.79	.82	(.81)*

*Comparable reliability coefficients reported in the manual are offered in parentheses for comparison.

disclosed. When 414 fourth-, fifth-, and sixth-grade pupils were tested twice with Form A and twice with Form B, it was found that ceiling scores and basal scores had to be established individually for 161 pupils and 15 pupils respectively. The alternate form reliability coefficients

Table 3.—Test-Retest Reliability of the PPVT for Grades Four, Five and Six

	Form A $r_{A_1 \cdot A_2}$	Form B $r_{B_1 \cdot B_2}$	Combined A & B $r_{A_1B_1 \cdot A_2B_2}$
Grade 4 (N=158)------	.82	.85	.90
Grade 5 (N=126)------	.80	.73	.88
Grade 6 (N=130)------	.84	.73	.84

compared favorably with those reported in the manual. Test-retest reliability coefficients ranged from .73 to .85. Combining the two forms into a test twice as long yielded test-retest reliability coefficients of .90, .88, and .84 for the fourth, fifth, and sixth grades respectively. Practice effect between Form A and B administered consecutively ranged up to approximately five IQ points. Five weeks between tests reduced the practice effect by approximately half (2½ IQ points). When the two forms were combined into one test, the practice effect over a five-week period was reduced to approximately one and one-half IQ points.

Recommendations

In group form, the time required to administer each separate form was one-half hour. The total testing time for both Form A and Form B when combined into one longer test was one hour. Since using both forms of the PPVT combined into one longer instrument increases the reliability with very little practice effect on the retest, it is recommended that the psychometrist using the PPVT give serious consideration to the advantage of using both forms of the test as one longer instrument. The advantage of gaining a more reliable measure of pupil performance would usually more than justify the additional expenditure in testing time.

While the reliability of group testing may equal that of individual testing with the PPVT, there

Table 4.—Practice Effect of the PPVT for Grades Four, Five and Six

	Mean of First Administration	Mean of Second Administration	Difference Between Means	Critical Ratio
Grade 4 (N=158)	Form A_1 100.91	Form B_1 105.75	4.84	4.00†
	Form A_2 103.66	Form B_2 108.55	4.89	5.32†
	Form A_1 100.91	Form A_2 103.66	2.75	3.13†
	Form B_1 105.75	Form B_2 108.55	2.80	2.83†
	Form A_1B_1 103.99	Form A_2B_2 101.31	.32	.24
Grade 5 (N=126)	Form A_1 105.98	Form B_1 109.96	3.98	3.32†
	Form A_2 108.34	Form B_2 110.75	2.41	2.08*
	Form A_1 105.98	Form A_2 108.34	2.36	2.27*
	Form B_1 109.96	Form B_2 110.75	1.79	1.48
	Form A_1B_1 108.30	Form A_2B_2 109.74	1.44	1.87*
Grade 6 (N=130)	Form A_1 107.15	Form B_1 108.47	1.32	1.25
	Form A_2 109.02	Form B_2 109.83	.81	.86
	Form A_1 107.15	Form A_2 109.02	1.87	2.15*
	Form B_1 108.47	Form B_2 109.83	1.36	1.16
	Form A_1B_1 108.18	Form A_2B_2 109.66	1.48	1.83*

*Significant at .05 level.
†Significant at .01 level.

can be no confident conclusion that validity coefficients will remain the same. New factors or influences may be introduced in an otherwise reliable variation of these procedures. Future validity studies comparing group forms with individual forms are needed to provide this information.

FOOTNOTES

1. Formerly at the University of Virginia.
2. Appreciation is expressed to Mrs. Anna Watson, principal of McIntyre School, and Mr. Charles Simmons, principal of Meriwether Lewis School, both of the Albemarle County School Division, Virginia, for their cooperation in this study. Appreciation is also expressed to the graduate assistants who helped with this study, and to Dr. Donald Shoemaker of the University of Virginia for assistance with the audio-visual equipment and procedures.

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