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Spring 1983

A Comparison of Educably Mentally Retarded Students' Brigance, PIAT, and WRAT Achievement Scores

JIMMY D. LINDSEY

A survey of local education agencies (LEAs) across the United States would reveal that many of these systems are adopting Brigance's (1977) *Inventory of Basic Skills* or Brigance's (1981) *Inventory of Essential Skills* to identify educably mentally retarded (EMR) pupils' reading, mathematics, and spelling achievement levels. This survey would also reveal that the two primary academic batteries being replaced by Brigance's tests are Dunn and Markwardt's (1970) *Peabody Individual Achievement Test* (PIAT) and Jastek and Jastek's (1976) *Wide Range Achievement Test* (WRAT). The LEAs surveyed would probably provide a number of reasons why they are switching to the Brigances, including: (a) the two Brigance tests are achievement batteries and test the necessary academic skills; (b) a neighboring LEA adopted the Brigance tests and their teachers prefer these assessment devices; (c) the Brigance tests have behavioral objectives which correspond to test items, and these objectives facilitate Individual Education; (d) the two Brigance tests are relatively inexpensive (\$54.95 elementary and \$99.00 secondary) considering the diagnostic information obtained and behavioral objectives given, when compared to the PIAT (\$30.00 Volume I and \$33.00 Volume II) and the consumable WRAT (\$12.60 specimen kit and 50 student response sheets); and (e) the Brigance subtests' scores are comparable to the scores of the PIAT and WRAT subtests. There appears to be some evidence to accept the first four reasons; however, hard data do not exist to substantiate the fifth reason.

Local systems continue to adopt the Brigance tests to replace the PIAT and WRAT. Hard data have been generated (cf., Burns, Peterson, & Bauer, 1974; and others) to validate the comparability and correlations between PIAT and WRAT subtests. However, empirical evidence has not been generated to validate the comparability of the three tests' scores. Therefore, a question that must be answered is, "Do EMR children and youth have comparable Brigance, PIAT, and WRAT reading, mathematics, and spelling achievement scores?" The purpose of this study was to answer this question.

METHOD

Subjects

Two hundred and twenty (220) EMR pupils were selected to participate in this study. "Educable mental retardation" was defined as, 1) an intellectual ability approximately two to three standard deviations below the mean, and 2) a significant deficit in adaptive behavior. Sixty-one (61) of the EMR students were receiving general and special education services in an elementary setting while the remaining 159 EMR students were receiving the same services in a secondary setting. The elementary pupils' mean chronological age was 118 months (*S.D.* = 12.5) and mean IQ was 61 (*S.D.* = 6.6). The secondary students' mean chronological age was 178 months (*S.D.* = 18.4) and mean IQ was 63 (*S.D.* = 6.2). It must be noted that EMR pupils participating in this study were not influenced by a "Brigance-oriented program."

Instruments and Analyses

Three instruments were used. Pupils were administered the *Inventory of Basic Skills* (Brigance, 1977) or *Inventory of Essential Skills* (Brigance, 1981), *PIAT* (Dunn & Markwardt, 1970), and *WRAT* (Jastek & Jastek, 1976). A *t*-test procedure for matched pairs or paired observations (Popham & Sirotnik, 1973) was used to process the reading, mathematics, and spelling responses across the three tests. An .05 probability level was the criterion for significance.

General Procedures

Students participating in the study were individually tested by their special education teacher. Three separate testing sessions were scheduled and conducted. To negate the effect of test administration order, teachers testing more than one student were directed to give: a) the first student the appropriate Brigance, PIAT, and then the WRAT; b) the second student the PIAT, WRAT, then the appropriate Brigance; c) the third pupil the WRAT, the appropriate Brigance, and then the PIAT; and so on. . . .

RESULTS

All 220 students were administered the Brigance, PIAT, and WRAT. Table 1 presents the students' reading, mathematics, and spelling achievement score means, standard deviations, and ranges. Elementary EMR pupils had their highest mean reading, mathematics, and spelling responses on the WRAT, Brigance and WRAT, and WRAT, respectively. They

evidenced their lowest mean reading, mathematics, and spelling achievement on the Brigance, PIAT, and Brigance, respectively. The secondary EMR students demonstrated their highest reading, mathematics, and spelling mean scores on the Brigance and WRAT, Brigance, and WRAT, respectively. These pupils evidenced their lowest mean reading, mathematics, and spelling achievement responses on the PIAT, WRAT, and Brigance, respectively.

TABLE I
STUDENT DATA IN MONTHS BY ACADEMIC SUBJECT,
TEST BATTERY, AND EDUCATIONAL LEVEL

Academic Subtest	Test Battery	Elementary			Secondary		
		\bar{X}	S.D.	Ranges	\bar{X}	S.D.	Ranges
READING	Brigance	18	8.3	0-49	33	10.9	9-72
	PIAT	19	9.5	0-56	31	11.1	12-81
	WRAT	22	8.8	0-52	33	13.6	9-92
MATHEMATICS	Brigance	20	7.6	0-45	39	8.9	9-63
	PIAT	18	6.1	0-36	35	11.8	9-76
	WRAT	20	6.6	0-39	34	12.7	9-81
SPELLING	Brigance	14	7.6	0-45	26	10.1	0-63
	PIAT	20	8.1	0-48	34	12.2	10-85
	WRAT	21	7.6	0-45	35	10.4	14-73

Table 2 portrays a summary of the *t*-test analyses of the elementary EMR pupils' achievement scores by academic subtests and achievement battery comparisons. Elementary EMR students scored differently on the Brigance subtests as compared to the PIAT and WRAT subtests. On the reading subtests, the pupils' Brigance mean scores were comparable to their PIAT mean responses but significantly lower than their WRAT mean scores. Their PIAT reading mean achievement was significantly lower than their WRAT reading mean achievement. On the mathematics subtests, the EMR students' Brigance mean responses were significantly higher than their PIAT mean scores but comparable to their WRAT mean scores. These students' PIAT mathematics mean scores were significantly lower than their WRAT mathematics mean responses. On the spelling subtests, the elementary EMR pupils' Brigance mean scores were significantly lower than their mean responses on both the PIAT and WRAT spelling subtests. There was no significant difference in their spelling mean achievement when their PIAT and WRAT spelling responses were compared.

TABLE 2
SUMMARY OF *t*-TEST ANALYSES OF ELEMENTARY PUPILS' RESPONSES

Academic Subtest	Test Battery Comparisons	<i>t</i> -test (<i>df</i> = 60)		Battery scored significantly higher on
		<i>t</i>	<i>p</i>	
READING	Brigance vs. PIAT	1.33	NS	--
	Brigance vs. WRAT	4.83	.001	WRAT
	PIAT vs. WRAT	3.70	.001	WRAT
MATHEMATICS	Brigance vs. PIAT	2.81	.01	Brigance
	Brigance vs. WRAT	1.28	NS	--
	PIAT vs. WRAT	2.96	.01	WRAT
SPELLING	Brigance vs. PIAT	6.13	.001	PIAT
	Brigance vs. WRAT	6.52	.001	WRAT
	PIAT vs. WRAT	1.96	NS	--

Additionally, Table 3 portrays a summary of the *t*-test analyses of the secondary EMR students' achievement scores by academic subtests and test battery comparisons. Secondary EMR pupils, like their elementary counterparts, scored differently on the Brigance reading, mathematics, and spelling subtests as compared to their responses on the PIAT and WRAT subtests. On the reading subtests, the secondary EMR students' Brigance mean achievement was significantly higher than their PIAT mean achievement but comparable to their WRAT mean achievement. Their PIAT reading mean scores were significantly lower than their WRAT reading mean responses. On the mathematics subtests, the secondary pupils' mean scores were significantly higher than their mean responses on both the PIAT and WRAT mathematics subtests. The secondary EMR students evidenced comparable mean scores on the PIAT and WRAT mathematics subtests. On the spelling subtests, the secondary EMR pupils' Brigance mean achievement was significantly lower than their PIAT and WRAT mean spelling achievement. There was no significant difference in these students' PIAT and WRAT spelling mean responses.

DISCUSSION

This study was designed and carried out to generate hard data to answer the question, "Do EMR children and youths have comparable Brigance, PIAT, and WRAT reading, mathematics, and spelling achievement scores?" The results reported indicate that these pupils do score differently on these three tests.

TABLE 3
SUMMARY OF *t*-TEST ANALYSES OF SECONDARY PUPILS' RESPONSES

Academic Subtest	Test Battery Comparisons	<i>t</i> -test (<i>df</i> = 158)		Battery scored significantly higher on
		<i>t</i>	<i>p</i>	
READING	Brigance vs. PIAT	2.95	.001	Brigance
	Brigance vs. WRAT	1.60	NS	--
	PIAT vs. WRAT	3.58	.001	WRAT
MATHEMATICS	Brigance vs. PIAT	6.46	.001	Brigance
	Brigance vs. WRAT	6.43	.001	Brigance
	PIAT vs. WRAT	0.93	NS	--
SPELLING	Brigance vs. PIAT	-5.45	.001	PIAT
	Brigance vs. WRAT	-6.05	.001	WRAT
	PIAT vs. WRAT	1.49	NS	--

Elementary. At the elementary level, if the Brigance is adopted to replace the PIAT, elementary general and special education personnel can expect their EMR students to demonstrate comparable reading scores, higher mathematics responses, and lower spelling achievement. If the Brigance is purchased to replace the WRAT, elementary general and special education personnel can expect their EMR pupils to have lower reading responses, comparable mathematics achievement, and lower spelling scores.

Secondary. At the secondary level, if the Brigance is adopted to replace the PIAT, secondary general and special education personnel can expect their EMR learners to evidence higher reading achievement, higher mathematics scores, and lower spelling scores. If the Brigance is adopted to replace the WRAT, general and special education personnel can expect their EMR pupils to demonstrate comparable reading scores, higher mathematics achievement, and lower spelling responses.

CONCLUSION

The results of this study do not support the LEA's selection of the Brigance to replace the PIAT and WRAT on the basis of comparable subtest scores. Elementary and secondary EMR children and youths do score differently on the academic subtests of these batteries. Therefore, the effective utilization of Brigance scores in EMR students' program and IEP development

will require that LEA personnel become familiar with the Brigance achievement responses and their variability when compared to the PIAT and WRAT.

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