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Results of two studies testing the effectiveness of the Visual-Linguistic Reading Program (Group A) as compared with that of a basal program using an overhead projector (Group B) and a basal program not using an overhead projector (Group C) are reported. Children from three cities in Minnesota, Florida, and California, 1,800 in the first study and 1,044 in the second, were pretested with the Metropolitan Reading Readiness Test and the Otis-Lennon Mental Ability Test and were tested at later times with Forms X and W of the Stanford Achievement tests. Results showed that Group A scored significantly higher than Group C on five of the 45 subtests (Word Reading, Paragraph Meaning, Vocabulary, Spelling, and Word Study Skills). A slight numerical superiority involving significant differences among the 45 subtests favored Group A over Group B. In terms of total scores for each of the five subtests in the high-, middle-, and low-ability groups, Group A was significantly better than Group C in all five. Tables are included for both studies. (MD)

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EVALUATING A VISUAL-LINGUISTIC, MULTI-MEDIA APPROACH TO PRIMARY READING.

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It may come as a surprise to note that of the 27 first grade reading studies sponsored by the U. S. Office of Education in 1964-65, only one had the word visual in its title--"Evaluation of Levels-Designed Visual-Auditory and Related Writing Methods of Reading Instruction in First Grade." In this study, as the title indicates, the visual component is not isolated and explored separately. In fact the initial paragraph describing the Visual-Auditory method does not once use the word visual. Obviously even in the one study most concerned with the visual, that element is still not accorded predominant attention. Yet reading is a visual act--the perceiving and comprehending of print. For that reason the visual dimension would seem to deserve particular attention and application if optimal help is to be provided for beginning readers.

But, important as any one element might seem, Dr. Russell G. Stauffer's comment in the October, 1966, issue of The Reading Teacher should be remembered. In his editorial discussing the various methods for teaching reading in the U. S. Office of Education First Grade Studies he writes, "regardless of the criterion used there is no one method."

With eclecticism as the guiding principle, the Visual-Linguistic Reading Program was built on a combination of methods and not on one only. Just as plant breeders have taken the best characteristics from several strains to develop superior varieties, so, in this program, five separate elements were fused to form a distinctly new approach. The program is intended to be more strongly oriented toward visual and linguistic elements than any other program yet devised for the teaching of reading. In addition, three other elements play an important role, making a total of five major components--1) the Visual, 2) the Linguistic, 3) the Contextual, 4) the Listening, and 5) the Programmed.

A program this different from the usual should, ideally, receive more intensive and extensive field and statistical testing than other programs. Fortunately the publishers were willing to provide just that--not one but two years of testing in three widely separated geographic locations--public school systems in St. Paul, Minnesota; Tampa, Florida; and La Mesa, California. The present evaluation is based on data collected from those two test years, 1966-67 and 1967-68.

The initial statistical testing during the 1966-67 school year was under the direction of the Supervisor of Reading and Special Learning Disabilities for the St. Paul Public Schools. The research design was structured to check the relative effectiveness of the Visual-Linguistic

Program as well as to isolate and check the importance of the visual strand. Toward that end a three-fold grouping was used. Group A used the Visual-Linguistic Program, which incorporated frequent and carefully structured use of transparencies and the overhead projector. Group B used the regular basal reading program found in the school system but with an overhead projector to add a strong visual dimension. As a control, Group C also used the regular reading program but with no overhead projector available.

In the fall of 1966 approximately 1,800 children from the three test centers were placed in one of the three experimental or control groups and given the Metropolitan Reading Readiness Test, followed in January, 1967, by Form X of the Stanford Achievement Test, and in May, 1967, by Form W of the same test. The study ran for approximately 140 days, following the pattern established by the United States Office of Education Studies on First Grade Reading Programs.

Based on the data collected during the first test year, comparisons were made using the adjusted mean scores for each of the six subtests of the Stanford Achievement Tests in each of the three schools, 18 subtest scores in all. By midyear, the Visual-Linguistic group (A) scored best in 6 of the 18 subtests, the overhead projector group (B) in 9 of the 18, and the regular program (C) in 3 of the 18. Differences at this point were, however, not significant.

The end of the year testing did reveal statistically significant differences--at the 5 per cent level or less ($P < .05$). The Visual-Linguistic group (A) out-scored to a significant degree the other two

groups in 5 out of 18 subtests, the overhead control group (B) scored significantly above the other two groups in 7 out of 18 subtests. The basal reading control group (C) scored significantly above the overhead projector group in only 1 out of 18 subtests and above the Visual-Linguistic group in no subtests. Other differences were not statistically significant.

The comparisons between the basal reading groups, B and C, where the only difference was between using or not using the overhead projector, provided statistically significant evidence of the importance of the visual element, one of the two matters of primary concern in this study. The findings indicate that use of the overhead projector brought measurably better results. The findings also provided pertinent evidence for justifying the strong emphasis on the visual factor in the Visual-Linguistic program. Despite the fact that the totally new Visual-Linguistic program demanded major adjustments on the part of the teachers, results were still significantly better than those in the regular basal programs, which involved no change from the usual teaching pattern.

In addition to the statistical checking, use was made of teacher ratings--scales designed to reveal more clearly the strengths and weaknesses in need of possible attention before the second year of testing. A five-point rating scale was used, with two positive ratings--Superior and Good, one neutral rating--Average or the same as other programs, and two negative ratings--Poor and Inferior, plus Not Answered.

The mid-year check showed 52.7 per cent of the teachers rated the program positively, 16.8 per cent neutrally, 23.2 per cent negatively, 7.2 per cent not answering. Of the 15 areas surveyed, the lowest rating

was given the teacher's manuals, no teacher rating them superior to those used before and 44 per cent rating them inferior. Immediate steps were taken to re-work the teacher's manuals completely.

The more complete ratings at the end of the year covered 22 areas and showed 61.2 per cent positive ratings, 24.4 neutral, 11.5 negative, and 2.7 not answering. While the end-of-the-year ratings still gave the teacher's manuals the lowest rating, only 18.1 per cent gave them the lowest rating--Inferior, as compared with 44.4 per cent at midyear, a noticeable improvement when all the manuals had been used.

In answering the question, "How well does the Visual-Linguistic Reading Series seem to work with the superior student?" 90.9 per cent of the teachers gave it the top rating--superior to other materials. The characters around which the series is built--Alphy, Canny Cat, Babby Big-Ear and Bob were, according to the ratings, characters the pupils related to extremely well, being rated superior by 31 to 77 per cent of the teachers.

Teacher ratings and results from the statistical check provided exactly the guidance needed in making revisions to strengthen the program before the second year of testing, which for 1967-68 was conducted by the Test Department of Harcourt, Brace and World, Inc.

The same three schools were used, a total of 1044 pupils being tested--three groups of 348 pupils, matched across groups in terms of their general mental ability and readiness of reading instruction. The Stanford Achievement Batteries, Form W, were used, the subtest on Arithmetic being omitted in the comparisons since this is out of the area of reading and differences between

treatment for that subtest were not significant.

For the second year of statistical testing, high, middle and low ability groups instead of geographic differences were studied along with the same three-fold experimental and control variables. Each of the three groups of 348 pupils was divided into three cells of 116 pupils each of high, middle, or low abilities. This meant 45 subtests, the 5 subtests dealing with reading for each ability grouping at each treatment.

Pupils, in class units, were presumably assigned at random to one of the three treatment groups. Analysis of pre-test measures raised some doubt about the randomness of the assignment, thus necessitating some adjustments in the data. It was intended that all pupils in the research program should take three tests: Metropolitan Readiness Test (MRT), 1966 Ed., Form A; Otis-Lennon Mental Ability Test (OLMAT), Primary II, Form J, 1967 Ed.; and Stanford Achievement Test, Primary I, Form W, 1964 Ed., including the following subtests: (1) Word Reading, (2) Paragraph Meaning, (3) Vocabulary, (4) Spelling, (5) Word Study Skills, (6) Arithmetic. MRT and OLMAT were taken in September, 1967, and the Stanford in May, 1968.

Before the data were analyzed, two adjustments in number of pupils were made. First, all incomplete cases were eliminated. An incomplete case was defined as one for which one or more of the eight test scores (MRT, OLMAT, and 6 Stanford scores) were missing; or for which there was not adequate information to determine whether the pupils belonged to Group A, B, or C for the entire academic year. Some switching of

pupils or teachers from one class to another during the year made such determination impossible in some instances.

The second adjustment involved a pre-test matching operation. Preliminary analysis of the data made it apparent that pupils in Group A were noticeably superior to pupils in Groups B and C and pupils in Group B were slightly superior to pupils in Group C in MRT and OLMAT scores. Therefore, pupils in the three groups were matched on the pre-test scores. It was decided that the most effective pre-test measure to use as a control would be a combination of MRT and OLMAT scores. Further, it was decided that a simple sum of raw scores on MRT and OLMAT would provide about as effective a control score as any other combination. This simple sum yields a weighting of MRT to OLMAT of about 1.5 to 1. Such a weighting is in the direction suggested by the relative correlation of MRT and OLMAT scores with the post-treatment Stanford test scores. Frequency distributions of MRT + OLMAT sum scores were prepared for each of Groups A, B, and C. The three groups were matched in five point intervals in the sum score. Then, since it was felt desirable to analyze the effect of the experimental treatments for pupils at differing initial ability levels, the three matched distributions were subdivided into three equal groups on the basis of MRT + OLMAT scores.

Table 1 summarizes the results of the matching, in terms of the pre-test scores. Although pupils were matched specifically in terms of the MRT + OLMAT sum scores, Table 1 also presents summaries of those two sets of scores separately.

Table I

Summary of Pre-test Scores for Sub-groups:
Means and Standard Deviations for MRT, OLMAT, and MRT + OLMAT

TREATMENT GROUPS:		A (348)		B (348)		C (348)	
READINESS ABILITY LEVEL	SCORES	M	SD	M	SD	M	SD
HIGH (348)		(116 cases)		(116 cases)		(116 cases)	
	MRT	75.4	5.4	74.7	5.6	74.3	6.3
	OLMAT	43.8	[illegible]2	44.4	4.0	44.3	4.3
	MRT + OLMAT	119.2	7.3	119.1	7.4	118.7	7.4
MIDDLE (348)		(116 cases)		(116 cases)		(116 cases)	
	MRT	63.6	4.5	62.2	5.5	61.7	5.3
	OLMAT	36.6	4.4	38.2	3.9	38.4	4.3
	MRT + OLMAT	100.1	5.0	100.4	4.9	100.1	4.9
LOW (348)		(116 cases)		(116 cases)		(116 cases)	
	MRT	48.5	9.4	47.1	8.6	46.7	8.4
	OLMAT	28.9	6.1	30.1	6.3	30.6	6.0
	MRT + OLMAT	77.4	11.3	77.2	11.4	77.3	11.7
TOTAL = 1044							

Performance of the three treatment groups as a whole and by level of pre-test (readiness-ability) was evaluated by means of analysis of variance techniques. Data for each of the six Stanford subtests was subjected to two-way analysis of variance (fixed effects model with replications within cells). Comparison of mean scores by treatment across and within levels was accomplished by way of the Newman-Keuls procedure. Raw scores were used for all analyses of Stanford Tests.

Results

The Visual-Linguistic Reading group (A) scored significantly higher than the control group (C) in five of the 45 subtests (Word Reading, Paragraph Meaning, Spelling, and Word Study Skills). The control group (C), on the other hand, scored significantly higher than the experimental group (A) in not a single one of the 45 subtests. Furthermore there was a slight numerical superiority in the tallies involving significant differences among the 45 subtests, a superiority favoring the experimental group (A) over the control group (B). In terms of total scores for each of the five subtests in all three ability groups, the Visual-Linguistic group (A) was significantly better than the basal control group (C) in all five, as revealed in Table 2.

Table 2

Summary of Order of Treatment Means and Significance of Differences Between Treatment Means Across and Within Levels *

Word Reading	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	B	C	A
Total	B	A	C

Paragraph Meaning	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	A	B	C
Total	A	B	C

Vocabulary	Best		Worst
High Ability	B	A	C
Middle Ability	B	A	C
Low Ability	B	A	C
Total	B	A	C

Spelling	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	A	B	C
Total	A	B	C

Word Study Skills	Best		Worst
High Ability	A	B	C
Middle Ability	B	A	C
Low Ability	B	A	C
Total	A	B	C

(*Treatment or group designations are arranged from highest to lowest mean scores, going from left to right--from best to worst, that is. Treatment designations not sharing an underline are significantly different. For example, in Word Reading, group A has the highest mean score, B the next highest and C the worst. A and B are not significantly different but A and B are significantly higher than C.)

The revisions and changes made after the first year of testing were, from all appearances, already being reflected in the statistical evidence from the second test year. As before, the addition of a stronger visual dimension through use of an overhead projector was enough to make the results for group B significantly better than those for group C. This was so, even though the three different school systems each used different basal reading programs. Such findings add further weight to the importance of the visual element in a reading program. Despite the fact that the basal programs were for most of the teachers the program that they had most experience with, the new Visual-Linguistic approach got significantly better results even at the initial testing stage.

Teacher ratings as well as statistical findings for the second year reflect the changes made after the first test year.

As revealed in Table 3, the over-all ratings are noticeable higher.

Table 3

Summary of Comprehensive Teacher Ratings

	Better than Average	Average	Worse than Average	Not Answered
Initial ratings (1966-7)	53%	17%	23%	7%
Final ratings (1966-7) (Year-end revisions)	61%	24%	12%	3%
Final ratings (1967-8)	70%	18%	9%	3%

For a more specific example, take the teacher's manuals, the area receiving most attention in the end-of-the-year revisions. The teachers

were asked, "How would you evaluate the teacher's manuals for the Visual-Linguistic Series?" On the initial rating for the 1966-67 test year, no teacher rated the manuals superior, 11% rated them good, 7% rated them average, 30% poor, and 44% inferior, 8% not answering. By the end of that first year after using all the manuals, the ratings were somewhat better--0% superior, 5% good, 23% average, 54% poor, and 18% inferior. The extensive revisions led to greatly improved ratings for the second test year--37% superior, 32% good, 21% average, 5% poor, and 0% inferior, 5% not answering.

Data from the first two years of testing is now being used as a basis for further changes and revisions to make up the final edition. The linguistic strand is being carefully re-developed to tap more fully the important contributions linguistic science has to make to reading instruction, the visual strand being closely integrated with it for maximum effectiveness.

In Summary:

1. On the five subtests from the Stanford Achievement Test related to reading there were significant differences between treatments on all five on the totals for high, middle, and low ability students, the Visual-Linguistic being significantly better than the basal reading control treatment and better but not significantly so from the overhead control.

2. At the middle and low ability levels, differences tended to lack significance.

3. Results for the Visual-Linguistic program tended to exceed those for the overhead projector control.

4. The overhead projector control (B) tended to exceed the Visual-Linguistic (A) with the middle and lowest ability groups, but not significantly.