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Ruth L. Bosma

Vern L. Farrow

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# TEACHING READING WITH i/t/a: A RESEARCH REPORT

*Ruth L. Bosma and Vern L. Farrow*

## **Introduction**

Perhaps the most radical of recent innovations to explode upon the embattled horizon of the continuing reading controversy is i/t/a, the Initial Teaching Alphabet.

Most previous attempts to devise systems for the simplification of beginning reading instruction have retained the traditional alphabet. By and large such programs have merely employed key sound-symbol pictures, colors, or various plans for the systematic introduction of phonemes or sound families emphasizing the structural consistencies of traditional orthography while postponing consideration of irrational exceptions. All have acknowledged the substantial number of irregularities prevalent in T.O. (traditional orthography) but have seemingly taken the view that there was nothing to be done about it. The beginning reader must learn to cope with the concomitant confusion and the sooner the better.

The assumption has been that the majority of children are able to surmount the confusion and learn to read. Further, the assumption has been that reading failure is not a reflection of the inadequacies of the medium but rather a result of limitations within the child. Volumes have been written attempting to identify the intellectual, physical, social, or emotional anomalies reputed to be present in children who have failed at beginning reading (9).

The developers of i/t/a, Sir James Pitman and his colleagues took a different tack. They were intrigued with the possibility that an important source of beginning reading failure was directly attributable to the traditional orthography or spelling of English (5). It was their belief that traditionally printed English overloads the beginner in three ways:

1. Too many characters. The T.O. beginner has to learn two or more different print characters (capitals and lower case, as well as various type styles) for each letter of the alphabet.
2. Too many whole-word representations resulting from the five or more different sets of characters in conventional print.
3. Too many phonic print-symbols as a result of our traditional alphabet and spelling in which there is a wide variety

of ways of signalling in print the restricted number of phonemes in English (2).

Recognizing reading as essentially a decoding process, Sir James Pitman and his staff set about devising a language code which would overcome the limitations of the traditional alphabet and yet retain sufficient commonality to permit easy transition to traditionally spelled material when the reader had achieved a solid grasp of the reading act. No attempt at spelling reform was envisioned (3). Accordingly, the Initial Teaching Alphabet evolved for beginning reading and is reputed to provide four major advantages over T.O.:

1. Consistent spelling. As a code for spoken English, i/t/a is much more consistent. Each of the phonemes is signalled by a different printed symbol, thus the beginner finds that he can rely on the code and is not led to doubt his rational approach to either reading or writing.

2. Consistency of direction. In traditionally printed English, words are read from left to right; however, in many words, the sound value of letters cannot be determined without violating the left-to-right procedure (e.g. made). In i/t/a the rule is uniformly consistent.

3. Fewer characters to be learned. Lower case characters only are used. Capitalization is represented in i/t/a merely by making a larger lower case shape.

4. Fewer whole-word representations need to be learned. Because only one letter shape is used, each word printed in i/t/a has only one form (4).

Experimentation with the new medium began in Britain in 1961 and to date more than eight thousand children have learned to read with i/t/a (5). Interestingly, not all of the focus has been on beginning readers but has also included rather extensive work with remedial cases ranging in age from seven to eleven years (2).

Following the cautiously optimistic reports from Britain (3), interest in the medium was generated in the United States resulting in an ambitious experiment in the Bethlehem, Pennsylvania Public Schools under the direction of Dr. Albert J. Mazurkiewicz and Dr. Harold J. Tanyzer. The findings of the Bethlehem study, published in the spring of 1965, at the conclusion of its second year, have been strikingly favorable (8). Reports of similar investigations from widely scattered parts of the country have been coming in increasingly and substantially support the British and Bethlehem conclusions (8, 10).

Since a major function of the Campus School at Western Michigan University involves experimentation with innovations in instructional concepts and procedures, the staff recognized the implications of the Initial Teaching Alphabet as well as the need for further research with the medium. The usual questions were raised concerning transition, the effect of i/t/a on later spelling in T.O., the possible value of i/t/a for boys in beginning reading, and the degree to which i/t/a might be a superior medium than the typical basal T.O. approach for first grade children.

**Purpose**

The purpose of the research design which grew out of the ferment of discussion was to test the following three null hypotheses:

1. First grade children will not learn to read more effectively through the medium of i/t/a than they will through similar procedures in which the medium is T.O.
2. First grade children will not learn to read as effectively without the inclusion of writing in the curriculum as those who receive regular instruction in writing as a part of the beginning reading program.
3. First grade boys will not learn to read more effectively through the medium of i/t/a than they will through similar procedures in which the medium is T.O.

It should be explained that the second hypothesis resulted from the feeling that great difficulty with later spelling in T.O. might be experienced from the overlearning of many word configurations unique to i/t/a. It was felt that writing i/t/a would produce excessive reinforcement of the mental images of such word forms, and would thus contribute in a major way to later spelling problems. Research and application in connection with kinesthetic-tactile procedures by such educators as Fernald (7) seemed to support the contention. Accordingly, it was decided to eliminate writing completely from the experimental instructional program until children began to use words spelled in T.O. It should be appreciated that the deletion of writing from the experimental i/t/a program while allowing writing instruction to remain in the control procedures marked this study as unique among i/t/a research projects, and also posed a severe and unconventional test of the effectiveness of the i/t/a medium.

**Procedures**

To test the hypotheses stated above, the first grade class of the Western Michigan University Campus School was selected to be the

experimental population. This group was comprised of twenty-two subjects, eleven boys and eleven girls.

Two first grade classes in a Kalamazoo Public School provided a total population of forty-nine subjects from which twenty-two were ultimately matched with the experimental subjects to serve as a control group.

The Campus School and Public School groups were administered the Metropolitan Reading Readiness Test and the Lorge-Thorndike Intelligence Test in September, 1964, and were then equated with reference to sex; C.A.; Metropolitan Reading Readiness Test score; and I.Q. Although no attempt was made to match the groups with respect to socio-economic status, the public school from which the controls were obtained was chosen because of the similarity of community composition with that of the Campus School population.

Table I shows the characteristics of the experimental and control groups and indicates that the matching was such that there were no significant differences between the group means of the criteria employed.

TABLE I

Comparison of Experimental and Control Groups with Respect to Chronological Age, Reading Readiness Scores, and Intelligence, September, 1964.

	Experimental		Control		DM	t
	i/t/a Group (N=22)	Group	t. o. Group (N=22)	Group		
	M	SD	M	SD		
C.A. (Months)	84.3	2.77	85	3.67	.7	.714 (NS)
Reading Readiness <sup>1</sup>	60.7	5.80	59.3	4.85	1.4	.864 (NS)
I.Q. <sup>2</sup>	114.5	12.3	114.9	11.72	.4	.110 (NS)

1. Metropolitan Reading Readiness Test

2. Lorge-Thorndike Intelligence Test

NS Not significant

Although the subjects comprising the control group were distributed between two first grade classrooms, the teachers responsible for reading instruction were judged to be comparable to each other and to the Campus School teacher in qualification, experience, and professional reputation.

None of the subjects in the experimental group entered first grade with any formal reading skill. They began immediately in September, 1964, undergoing the i/t/a beginning reading program recommended

by the publishers of the materials with one major alteration. As explained earlier, those portions of the i/t/a reading program involving writing were deleted. However, extensive provisions were made for language development through conversation, discussion, listening activities, dramatic play, experience stories recorded by the teacher, and oral reading. In addition to supplementary oral language experiences a continuous art program specifically designed to prepare the children for writing was undertaken. Stick drawings involving vertical, horizontal, and diagonal lines, as well as circles and arcs, were stressed in these art activities.

Subjects in the control group were not aware of their selection and they were not identified to the teachers. The controls were not segregated from their respective classes and they underwent the typical beginning reading program recommended by a major publisher of basal reading texts. The remainder of the first grade academic work of the control subjects was likewise unaltered and included the usual correlation of writing with the reading instruction.

In May, 1965, at the close of the school year, Metropolitan Achievement Tests, Form B/Primary I Battery were administered to both experimental and control groups to provide a post-instruction evaluation. It should be noted that although these tests are published in T.O., the experimental i/t/a group took them without assistance in strict accordance with the standardized instructions for administration.

The results of the post-instruction testing are discussed in the following section.

#### **Analysis of the Data**

The statistical procedures employed in the analysis of the data in the study consisted of computing means and standard deviations for the matching criteria and for the grade equivalents obtained by the experimental and control groups on the Metropolitan Achievement Tests. The differences between these means were then subjected to the t test to determine statistical significance. Differences were judged to be statistically significant if they reached the .05 level of confidence. A further analysis was then made of the performance on each of the individual sub-tests: Word Knowledge, Word Discrimination, and Reading to determine the frequency and percent of subjects in the experimental and control groups achieving various grade equivalents.

Table II shows a comparison of post-instruction achievement of the experimental and control groups with respect to mean grade equivalents and standard deviations on the three sub-tests.

TABLE II

Comparison of Post-Instruction Achievement of Experimental and Control Groups Measured by the Metropolitan Achievement Tests, May, 1965.

	Experimental i/t/a Group (N=22)		Control t. o. Group (N=22)		DM	t
	M	SD	M	SD		
	(Grade Equiv.)		(Grade Equiv.)			
Word Knowledge	2.82	.42	2.25	.39	.57	4.67 (*)
Word Discrimination	2.99	.45	2.62	.64	.37	2.21 (***)
Reading	3.15	.40	2.65	.85	.50	2.50 (**)

\* Significant at .01 level

\*\* Significant at .02 level

\*\*\* Significant at .05 level

It will be noted that the mean performance of the experimental group on each of the sub-tests significantly exceeded (.05 or above) that of the control group. Further, reference to the standard deviation for each group indicates that performance of the experimental group was much more closely clustered and generally narrower in range than that of the control group, suggesting not only more efficient but more homogeneous achievement.

In view of the foregoing data, null hypothesis 1, that first grade children will not learn to read more effectively through the medium of i/t/a than they will through similar procedures in which the medium is T.O. was rejected. Likewise, null hypothesis 2, that first grade children will not learn to read as effectively without the inclusion of writing in the curriculum as those who receive regular instruction in writing as a part of the beginning reading program was rejected.

Table III shows the frequency distribution of grade equivalents on the Word Knowledge sub-test obtained by the experimental and control groups.

TABLE III

Distribution of Metropolitan Achievement Word Knowledge Sub-Test Grade Equivalents by Experimental and Control Groups, May, 1965.

Grade Equiv.	Experimental i/t/a Group (N=22)			Control t. o. Group (N=22)		
	Freq.	%	Cumulative %	Freq.	%	Cumulative %
3.8-4.0						
3.6-3.8						
3.4-3.6						
3.2-3.4	8	36.36	36.36	1	4.55	4.55
3.0-3.2						
2.8-3.0	4	18.18	54.55	2	9.09	13.64
2.6-2.8	6	27.27	81.82	3	13.64	27.27
2.4-2.6	2	9.09	90.91	6	27.27	54.54
2.2-2.4				2	9.09	63.64
2.0-2.2	1	4.55	95.45			
1.8-2.0	1	4.55	100.00	6	27.27	90.91
1.6-1.8				1	4.55	95.45
1.4-1.6				1	4.55	100.00

Reference to the cumulative per cent column indicates that 95.45% of the experimental group scored at the second grade level or above, while only 63.64% of the control achieved comparable levels. Of equal interest is the fact that only 4.55% of the experimental group achieved less than second grade level (none below 1.8) while 36.37% of the control group failed to reach second grade equivalent (9.10% below 1.8). These data would suggest that the i/t/a program produced significantly superior results with the lower end of the ability spectrum. Referring to the upper end of the performance range it will be seen that 36.36% of the experimental group achieved a grade equivalent of 3.2 or above, while only 4.55% of the control group matched this performance, suggesting that the i/t/a program was also eminently beneficial for the able pupil.

Table IV shows the frequency distribution of grade equivalents on the Word Discrimination sub-test obtained by the experimental and control groups.



TABLE IV

Distribution of Metropolitan Achievement Word Discrimination Sub-Test Grade Equivalents by Experimental and Control Groups, May, 1965.

Grade Equiv.	Experimental i/t/a Group (N=22)			Control t. o. Group (N=22)		
	Freq.	%	Cumulative %	Freq.	%	Cumulative %
3.8-4.0						
3.6-3.8	7	31.82	31.82	4	18.18	18.18
3.4-3.6						
3.2-3.4						
3.0-3.2	4	18.18	50.00	3	13.64	31.82
2.8-3.0	1	4.55	54.55	4	18.18	50.00
2.6-2.8	4	18.18	72.73			
2.4-2.6	6	27.27	100.00	3	13.64	63.64
2.2-2.4						
2.0-2.2				3	13.64	77.27
1.8-2.0				4	18.18	95.45
1.6-1.8						
1.4-1.6				1	4.55	100.00

Reference to the cumulative per cent column indicates 100% of the experimental population achieved grade equivalents of 2.4 or above, while only 63.64% of the control group obtained such scores. This suggests that there was no detrimental effect in regard to either aural or visual discrimination of words as a result of exposure to i/t/a word configurations. Further, it should be noted that 31.82% of the experimental group achieved grade equivalents of 3.6 or above, while only 18.18% of the controls reached a similar level, suggesting again that both ends of the ability range were accelerated by the i/t/a program.

Table V shows the frequency distribution of grade equivalents on the Reading sub-test obtained by the experimental and control groups.

TABLE V

Distribution of Metropolitan Achievement Reading Sub-Test Grade Equivalents by Experimental and Control Groups, May, 1965.

Grade Equiv.	Experimental i/t/a Group (N=22)		Cumulative %	Control t. o. Group (N=22)		Cumulative %
	Freq.	%		Freq.	%	
3.8-4.0	3	13.64	13.64	3	13.64	13.64
3.6-3.8	4	18.18	31.82	2	9.09	22.73
3.4-3.6	6	27.27	59.09	1	4.55	27.27
3.2-3.4				1	4.55	31.82
3.0-3.2	2	9.09	68.18	1	4.55	36.36
2.8-3.0	1	4.55	72.73	3	13.64	50.00
2.6-2.8	1	4.55	77.27	1	4.55	54.55
2.4-2.6	1	4.55	81.82			
2.2-2.4	2	9.09	90.91	1	4.55	59.09
2.0-2.2				2	9.09	68.18
1.8-2.0	2	9.09	100.00	4	18.18	86.36
1.6-1.8				2	9.09	95.45
1.4-1.6				1	4.55	100.00

Reference to the cumulative per cent column indicates that 90.91% of the experimental group reached a reading grade equivalent of 2.0 or above, while 68.18% of the controls obtained such levels. Perhaps more significant is the fact that only 9.09% of the experimental group reached less than second grade level (none below 1.8) while 31.82% of the control group fell below grade equivalent 2.0 with 19.64% achieving 1.6 or less. These data suggest that the i/t/a program was better able to develop the total reading performance of the lower end of the ability spectrum than was the T.O. program. While performance of the two groups at the highest end of the scale was comparable, it is noteworthy that 68.18% of the experimental group reached a reading grade equivalent of 3.0 or above, while only 36.36% of the control group matched this performance, suggesting that superior achievement was more consistent among the experimental subjects.

Table VI shows a comparison of post-instruction achievement of boys in the experimental and control groups with respect to the mean grade equivalents and standard deviations on the three sub-tests.

TABLE VI

Comparison of Post-Instruction Achievement of Boys in Experimental and Control Groups Measured by the Metropolitan Achievement Tests, May, 1965.

	Experimental i/t/a Group (N=11)		Control t. o. Group (N=11)		DM	t
	M	SD	M	SD		
	(Grade Equiv.)		(Grade Equiv.)			
Word Knowledge	2.76	.35	2.15	.45	.61	3.59 (*)
Word Discrimination	2.84	.39	2.55	.62	.29	1.31 (NS)
Reading	3.03	.60	2.35	.73	.68	2.39 (***)

\*\*\* Significant at .05 level

\* Significant at .01 level

NS Not significant

These data reveal that the performance of boys in the experimental group on the Word Knowledge sub-test exceeded significantly (.01 level) that of their counterparts in the control group. This may be explained in large measure by the broader vocabulary experiences provided by the i/t/a program. While the mean grade equivalent on the Word Discrimination sub-test was greater for the experimental boys it did not reach statistical significance in accordance with the criteria of this study. Interpretation of this performance should be tempered by the fact that the experimental subjects having been exposed only to i/t/a word configurations all year had just recently transitioned to T.O. and took the Metropolitan Achievement Tests written in T.O. Thus it may be justifiably assumed that their performance with T.O. word configurations might be expected to show a less than significant advantage over the control subjects. Comparison of mean grade equivalents on the Reading sub-test again favored the boys in the experimental group to a significant degree (.05 level), suggesting that instruction with the i/t/a medium was relatively more beneficial for boys in this study. Standard deviations for the experimental group of boys on all three sub-tests were more closely clustered and narrower in range suggesting greater homogeneity of achievement. On the basis of the foregoing data, null hypothesis 3, that first grade boys will not learn to read more effectively through the medium of i/t/a than they will through similar procedures in which the medium is T.O. was rejected.

Table VII shows a comparison of post-instruction achievement of girls in the experimental and control groups with respect to the mean grade equivalents and standard deviations on the three sub-tests.

TABLE VII

Comparison of Post-Instruction Achievement of Girls in Experimental and Control Groups Measured by the Metropolitan Achievement Tests, May, 1965.

	Experimental i/t/a Group (N=11)		Control t. o. Group (N=11)		DM	t
	M	SD	M	SD		
	(Grade Equiv.)		(Grade Equiv.)			
Word Knowledge	2.89	.42	2.45	.41	.44	2.50 (***)
Word Discrimination	3.14	.45	2.69	.64	.45	1.91 (NS)
Reading	3.27	.63	2.95	.84	.32	1.01 (NS)

\*\*\* Significant at .05 level

NS Not significant

While the mean grade equivalent of the experimental girls on the Word Knowledge sub-test was significantly higher (.05 level), differences in performance on the Word Discrimination and Reading sub-tests were not statistically significant as defined by the criteria of this study. Perhaps as was suggested in the case of the experimental boys, the broader vocabulary experiences provided through the i/t/a materials may account for this similar advantage in word knowledge on the part of girls in the experimental group. Although standard deviations favored the experimental girls, these differences between the groups in terms of cluster and range were not as great as was the case with the boys. Analysis of these comparative data suggests that instruction with the i/t/a medium was slightly more beneficial than basal instruction in T.O. for girls in this study; however, the advantage was less marked than for boys.

Table VIII shows a post-instruction comparison of achievement of boys and girls in the experimental group with respect to the mean grade equivalents and standard deviations on the three sub-tests. Table IX provides similar data with respect to boys and girls in the control group.

TABLE VIII

Comparison of Post-Instruction Achievement of Boys and Girls in Experimental Group Measured by the Metropolitan Achievement Tests, May, 1965.

	Boys (N=11)		Girls (N=11)		DM	t
	M	SD	M	SD		
	(Grade Equiv.)		(Grade Equiv.)			
Word Knowledge	2.76	.35	2.89	.42	.13	.792 (NS)

Word Discrimination	2.84	.39	3.14	.45	.30	1.68 (NS)
Reading	3.03	.60	3.27	.63	.24	.920 (NS)

NS Not significant

TABLE IX

Comparison of Post-Instruction Achievement of Boys and Girls in Control Group Measured by the Metropolitan Achievement Tests, May, 1965.

	Boys (N=11)		Girls (N=11)		DM	t
	M	SD	M	SD		
Word Knowledge	2.15	.45	2.45	.41	.30	1.65 (NS)
Word Discrimination	2.55	.62	2.69	.64	.14	.522 (NS)
Reading	2.35	.73	2.95	.84	.60	1.79 (NS)

NS Not significant

In neither case were differences in mean grade equivalents statistically significant, although the performance of girls in both the experimental and control groups exceeded those of the boys. Standard deviations for boys and girls in each case were rather closely comparable. These data indicate that girls achieved slightly better scores in the three sub-tests than did the boys in their respective groups regardless of the medium employed in teaching beginning reading. Such a finding might have been anticipated in view of the typically more advanced development of girls at the first grade level.

### Conclusions

✓ Within the limitations of the research design and with respect to the sample population, the following conclusions were judged to be warranted:

1. First grade children taught to read with the i/t/a medium achieve reading skills significantly superior to those of children taught by typical basal T.O. materials.
2. First grade children taught to read with the i/t/a medium, but without the benefit of writing experiences achieve reading skills significantly superior to those of children taught by typical basal T.O. materials and procedures including systematic writing instruction.

3. First grade boys learn to read more readily and effectively with i/t/a than with typical basal T.O. materials.

4. Transition from i/t/a to T.O. materials does not pose a significant problem for first grade children.

5. Beginning reading instruction employing i/t/a symbols and phonemic spelling does not impair discrimination of word configurations in T.O.

6. Beginning reading instruction employing i/t/a materials provides first grade children with a more extensive and enriched vocabulary.

#### **Recommendations for Further Study**

Research in education suffers from a variety of limitations, as does research in the behavioral sciences. These limitations are imposed by the very nature of the subjects studied. Human learning is not yet fully understood and the ramifications of myriad personality, social, hereditary, and environmental characteristics serve to complicate the researchers' efforts.

In the study reported above, many gaps bearing upon interpretation are acknowledged. For example, the extent to which the Hawthorne Effect contributed to the ultimate findings remains unknown. Further, no adequate instrument is yet available for determining accurately the influence of parental model and aspiration on a child's beginning reading achievement. Of equal importance is the question of the effect upon the performance of the individual child of imagined or real pressures imposed by teacher, peers, and siblings with respect to his willingness to expose himself to the competition inherent in the beginning reading experience. Lack of knowledge in these and other areas continues to generate doubt concerning the findings of research in reading.

With specific reference to the efficacy of i/t/a as a medium for teaching beginning reading, more controlled studies are needed comparing i/t/a with various other approaches, sampling large populations of differing characteristics throughout the country. And, most certainly longitudinal studies to determine the performance and reading needs of i/t/a taught pupils through the elementary grades are imperative.

Although reports concerning i/t/a to date have been consistently favorable, some American educators feel that we are far from possessing a body of valid research evidence from which decisions regarding major innovations in reading curricula may justifiably be made (6). There is continuing need for researchers and teachers to focus so-

phisticated, well designed experimentation upon the pressing questions suggested above.

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Ruth Bosma is an Assistant Professor of Education and First Grade Supervisor at Western Michigan University Campus School. She took her Bachelor and Masters Degrees at Western and has taught in both elementary and secondary public schools.

Vern Farrow was formerly an Assistant Professor of Education at Western Michigan University and is currently on the staff of the School of Education at the University of Oregon. He specializes in Elementary Education with emphasis in Reading, Language Arts, and the Social Studies. Prior to taking the Doctorate at the University of Oregon, Dr. Farrow taught in both elementary and junior high schools in Seattle, Washington.