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TABLE VII. Differences between Contrast and Experimental Illiterate Adult Groups on Measures of Intelligence, Auditory Discrimination, and Visual Function

Variable	Contrast Group		Experimental Group		Significance of Difference
	No.	%	No.	%	
<i>Intelligence</i>					
IQ under 80	6	35.3	23	69.7	$X^2 = 5.437$, df 1, $p < .02$
IQ above 80	11	64.7	10	30.3	
Total	17	100.0	33	100.0	
<i>Auditory Discrimination</i>					
More than 4 errors (poor)	8	28.5	8	36.3	n.s.
4 errors or less (passable)	20	71.4	14	63.6	
Total	28	99.9	22	99.9	
<i>Visual Function-Fusion</i>					
Score 5 or less (fail)	5	15.6	12	36.3	$X^2 = 3.593$, df, 1, p approximately .05 (.05 = 3.84)
Score over 5 (doubtful to pass)	27	84.4	21	63.7	
Total	32	100.0	33	100.0	
<i>Visual Function-Phoria</i>					
Score 5 or less (fail)	15	45.4	14	42.4	n.s.
Score over 5 (doubtful to pass)	18	54.6	19	57.6	
Total	33	100.0	33	100.0	
<i>Visual Function-Cheiroscope</i>					
Score under 5 (fail)	9	26.5	7	22.5	n.s.
Score 5 or more (doubtful to pass)	25	73.5	24	77.5	
Total	34	100.0	31	100.0	
<i>Color Blindness</i>					
Score 2 and over (defective)	9	36.0	7	25.0	n.s.
Score 1 (normal)	16	64.0	21	75.0	
Total	25	100.0	28	100.0	

A Research Report on Colour Story Reading

J. Kenneth Jones

While use of color in the various visual media has increased enormously, typography remains essentially black and white. Colour Story Reading was developed to make use of color in helping children learn to read. The theory and practice of Colour Story Reading is discussed, including two studies testing this approach: one showing children's preferences and better performance, and another showing superior reading attainment in black and white after initial reading with color.

In visual media there has recently been a tremendous movement away from black, white, and grey—and into color. This can be seen in photography, films, television, advertising, and book illustrations.

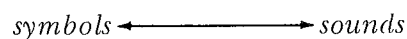
Typography is the tortoise. The largest areas covered by typography remain black and white. Only in the field of display and advertising material has color made any real impact. Yet here the advance is impressive. To glance at a selection of book jackets is to see the extent to which colored print or colored backgrounds have taken over from black and white.

In September, 1967, Thomas Nelson and Sons, London, published Colour Story Reading (Jones, 1967b). This was an event which may be of even more significance to typography than the invasion of color into advertising. For the first time, schools and parents were able to obtain children's reading books in which the entire text is in a phonetic color code. Instead of children learning to read with black print, they learn with colored print. The basic educational idea, of course, is to help children to learn to read in black print. This is done by making the initial learning processes more enjoyable and helpful by adding color to shape.

Colour Story Reading material includes 19 stories which are

read to the children by the teacher (or played on a recording) so as to conceptualize all of the sounds. Psychologically, this is an important advance from the inefficient paired-associate learning systems in use at present.

Paired-associate learning is the linking of one item with another. In the case of reading it is linking the squiggles the child sees on paper with the sounds of speech. This can be represented diagrammatically as follows:



In the customary "look and say" method, the symbols are the sentences and the words, which are linked purely by convention with the sounds of these words and sentences. In the phonic method the learning situation is the same, but in this case the symbols are individual letter shapes, and the sounds are individual letter sounds. This is a highly inefficient learning strategy, as there is no natural or logical connection between a squiggle and a sound.

In Colour Story Reading, the learning situation might be termed "triangular discovery" as represented in the following diagram.



The three parts of the triangle interact, giving the child sufficient cues for him to use the material to help himself to learn to read. The teacher's task is not to "teach" reading, but to present the materials in such a way that the child is able to answer his own questions and solve his own problems. This brings learning to read into line with current educational practice in other fields, where great stress is laid on helping children to discover and learn for themselves.

How does Colour Story Reading work in practice? It is very difficult to describe adequately in a few words owing to the na-

ture of its conception. People judge things by previous experiences; in this case their previous experiences are in black typography.

However, the basic phonetic rule is that when a letter changes its sound it changes its color. Also, letters which have the same sound have the same color. Letter z is blue. Letter s is blue in such words as "his" because it has the z sound. When s has the hiss sound, as in "this," it is red. Letter c is also red when it has the hiss sound, as in "nice," but is normally blue, as in "cat."

The colored letters are augmented by nine colored backgrounds which vary in color (red, blue, and green) and shape (circle, square, and triangle). Letters are printed on the backgrounds in black, although when the teacher writes them, it is easier to use an outline. All the backgrounds represent particular sounds, except for the blue circle which represents silent letters. Only three colors are used in the whole code: red, blue, and green—plus black.

Here are a few examples of conceptualization. One of the 19 stories contains an incident at a pet shop where there is a red snake called Sam, who hisses, and a blue snake called Des, who is asleep and snores (making the "z" sound). In another story there is a boy called Ernest who is seen letting off fireworks. He appears to be standing in a round cloud of red firework smoke. He cannot answer questions, and keeps saying "er . . . er . . . er."

Some of the children's reading books are concerned entirely with these 19 stories. These books contain pictures of Sam (in an "s" shape) with the red letter s coming from his mouth, and Des, also in an "s" shape, with the blue letter s coming from his mouth. In the name Sam, the s is red, and in Des it is blue. The books also contain pictures of Ernest in his round cloud of red firework smoke. In the name Ernest, the first two letters are printed in a red circle.

Many other letters, apart from "er" can be written in a red circle, including "ear" in early, and even, if one wished to use such a word, "olo" in colonel.

Because color is used to give additional and accurate phonetic information, this does not imply that every child sounds out every letter of every word. In the colored reading books, the colored

words are written in sentences. The sentences have contexts. The contexts help the children to no less an extent than in black and white.

Also, the words have a visual wholeness. Just as it is easier to identify individual people because they wear clothes of different colors, so it is easier to identify individual words. Identical words are identical in color as well as identical in shape; different words are different in color as well as in shape. If everyone wore a black uniform it would be more difficult to differentiate between people. If each person always wore clothes in a particular color coding (heaven forbid), it would be even easier to identify people.

To help visual discrimination, letters which have similar shape have different colors: letter d is green, and letter b is blue, and so on.

Of course, when adults first see Colour Story Reading, their first impression is that it is confusing and bewildering. This is simply because adults have been so thoroughly programmed to responding to black print stimuli. Young children have not. They find color a tremendous help as a visual aid.

In order to be absolutely sure on this point, the author carried out an experiment with 110 nursery school children aged between 3½ and 5 years (1965). The children were given visual matching tests, and the scores indicated that they found the black material three times as difficult as the Colour Story Reading material. The overwhelming majority of these children said after the tests that they preferred the colored material. Many of them could not explain this, and when asked why, said "Because I did." But others said "Because it is pretty," "It's nicer," and so on. No child mentioned anything about scores. In fact, the handful of children who said they preferred the black material had just as high scores in color as the children who said they preferred the colored material. It should not be assumed, however, that similar results could necessarily be obtained by using other schemes in phonetic color.

Colored print for children need not necessarily be phonetic. It could be grammatical. Words could be coded in color according to the parts of speech, an idea which goes back at least as far as Hastings' "Exercises for Parsing in Color" (1905). Even earlier,

The following three pages are reproduced from a promotional booklet, "Colour Story Reading," through the kind permission of Thomas Nelson & Sons Ltd., London.

HOW COLOUR HELPS

Colour is purposefully used to overcome the problem of a language which is not consistently phonetic, in order to provide a one-for-one relationship between a spoken sound and its written symbol.*

county county
country country
cough cough
course course
coupon coupon
could could

do do
two two
woo woo
drew drew
true true
shoe shoe

The words on the left begin with the same three letters, but there is little indication in black how they should be pronounced. In colour, the difference is immediately apparent.

In the columns on the right, each word ending is spelt differently but pronounced the same. Colour too, makes this obvious.

Because colour is used in a consistent and meaningful way, it is a reliable guide to discrimination, identification and pronunciation. You can see how with a knowledge of the colour symbols, the child is in possession of a tool which he can use to read any word within his oral vocabulary.

*All the phonetic structures in this scheme are based on the standard work, 'Daniel Jones' "English Pronouncing Dictionary".

The ram runs.

The ram runs at Lemon.

The ram runs at the dustman.



Help!
Help!
Help!



On the right is part of a story which the teacher reads to the children, introducing the dustman and the ram—the mnemonics for the letters d and r. The relevant page from the child's reading book. Mr. Nen and his Friends, Part 1, is on the left. The lively illustrations reinforce the child's imagery and they also provide a positive background to aid the recognition of the new letters.

All the words used in the reading books are simple and appropriate, and because of the colours are distinctive and memorable. The child will read many of these words by the usual process of recognizing and remembering them as wholes, but if he should stumble on a word, there is the added invaluable clue of the imagery which the component letters of the word can suggest.

The coloured backgrounds

To preserve phonetic consistency without introducing unnecessary additional symbols or colours, three background shapes are used. Each of these shapes, in the three colours, indicates a specific sound which can be represented by

At that moment, Lemon saw the dustman coming down the lane towards the farm. He was wearing new green overalls, with a green cap on his head.

"Poor dustman," said Lemon, "He keeps saying 'd . . d.' because he always has a cold in his nose."

Ink said, "I expect he has the cold because of all the dust."

The dustman came up and said, "d.d.dello. d.d.dice to see you," and gave a big sniff.

But as he turned to talk to the friends, the dustbin he was carrying knocked open the gate to the field. The friends saw a flash of red, and there was the ram, standing with his head down, ready to run at them. "Help!" they shouted.

The ram went, "r.r.r.", and began to run towards them.

The dustman knew what to do. He shouted, "d.d.. open up, Umbrella, quickly." And just as quickly, Umbrella opened himself up, with a great flapping noise, right in the face of the ram.

many different spellings. On the opposite page, the red triangle indicates the "uh" sound which is spelled differently but pronounced the same in the words "the", "dustman", and "Lemon". The list of words in colour two pages back in

this brochure demonstrates the use of another background, the green circle, which indicates that several differently spelled words all contain an "oo" sound.

in 1899, the first reading book ever printed entirely in color was produced by Nellie Dale, which used color to indicate articulation of consonants—one color for voiced consonants, one for voiceless consonants and one for silent consonants. This was not always phonetic, for g being voiced in both "get" and "gem" had the same color, despite representing a different sound.

As children so obviously enjoy color and as it is a great visual aid, what rational reply can be given to a parent who asks, "Why must my child be taught to read in black and white which is so unsuitable to his natural interests and needs?" Why indeed! It may be objected that children have always learned to read by black print materials, but this says nothing more than "What is, is" and does not justify the practice.

Expense is not an objection, because children's reading books already use color for illustrations; and, as Colour Story Reading has shown, the actual reading books in color are not expensive. The main objection would be if learning to read in color made it more difficult to read in black at a later stage.

In Britain, the Department of Education and Science financed a large-scale investigation into this question. The experiment was carried out by the author in association with the Reading Research Unit of the University of London Institute of Education (Jones, 1967a). Colour Story Reading was chosen as representing those schemes which use colored print. Sufficient books in color were printed to last the average child about one year, and the investigation was carried on into a second year to see what happened to the subsequent level of attainment, and to see to what extent the teachers could use the color symbol code to help the children tackle their black print reading and spelling problems.

Nineteen schools were involved, with more than 400 children in the control group using ordinary materials, and a similar number using Colour Story Reading.

Children enter school at the age of five in England, and all 800 children in the experiment were tested at the end of their first year and at the end of their second year.

The test of reading attainment was in black print for both groups. This meant that the experimental group was never tested on its ability to read in color, but the children were tested on their

“transferred” ability in black print. The results showed substantial and significant gains for the experimental group using Colour Story Reading. By the end of the first year they were 5½ months ahead of the control group in reading attainment, and maintained this lead when tested at the end of the second year.

Of the 19 schools, 14 chose to use Colour Story Reading as a supplementary scheme to normal black print reading being used in the schools. In five schools, however, the teachers used Colour Story Reading as the main scheme in the early stages. In these five schools the experimental children were, on average, more than 12 months ahead in reading attainment at the end of the first year when compared with the control classes in the same schools. By the end of the second year, their lead over the control group in these five schools had increased to 13½ months. The more the teachers used colored reading, the more the children were able to read in black print.

There appears to be no doubt at all. Colored typography has entered children’s reading books, and it has come to stay.

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Adjustment to Unjustified Composition on the *Rotterdamsch Nieuwsblad*

C. H. Evers

On February 6, 1967, *Rotterdamsch Nieuwsblad* introduced unjustified composition throughout the newspaper. The advantages and disadvantages of unjustified newspaper composition are discussed. The history of its innovation in Rotterdam is described and illustrated—including the problems, benefits, and reception by readers. This article has been adapted from a report to a conference of the International Federation of Newspaper Publishers in Paris last fall.

Why Unjustified Lines?

A staunch champion of unjustified typesetting is always tempted to answer this question with a counter-question: Why do we go through all kinds of trouble, using vulnerable and expensive spacebands, complicating our perforating and casting operations, buying expensive computers, etc., just so that the beginning and the end of our lines of type run vertically parallel?

There appears to be no other reason for justification than the fact that we have traditionally composed type this way. The tradition dates back to a time when classical symmetry, now a shibboleth from a bygone age, was divine law. Symmetry—a concept long since abandoned in the arts—involves a similarity in size, shape, and position that we try very hard to avoid in the make-up of our newspaper pages for fear of becoming dull and uninteresting. The traditionalist may also claim that justified lines of type are easier to read because the variable length of the unjustified lines is very tiring to the eyes. However, only a very small percentage of our readers is able to perceive a newspaper column line in a single eye fixation. The faculty and habit of the vast majority requires several fixations per line. Of greater importance is the regular and even spacing between the words plus a logical,