

## COLOUR LEARNING IN RETARDED CHILDREN\*

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'... silly children, with no understanding ...'

*Jeremiah 4:22*

It has been observed<sup>1</sup> that mentally retarded children have colour preferences, preferring, for example, to pick red and yellow sweets from a multicoloured supply. Among normal nursery-school children the same 2 colours feature in tests for preference, and it has been suggested<sup>2</sup> that it might be useful to utilize these colours in formal teaching by printing (say) red letters on yellow paper, and that this might help children with perceptual difficulties to learn more easily.

We have attempted to explore this possibility among retarded children in order to ascertain what these children do with letters of different colours. Unfortunately the findings cannot be extrapolated to normal pupils.

### METHOD

Eleven boys were tested by one of us (E.K.) assisted by the class teacher within a classroom situation. The tests took place over a period of some 2 years and 6 of the pupils remained at school during this period while 5 left

—for various reasons—and were tested for periods a little short of a year (3 pupils), or somewhat over a year (2 pupils).

Sometimes the tests were done every few weeks or, with vacations intervening, after a lapse of some months, but each child was tested 10-30 times during the course of the investigation and each time the identical procedure was repeated.

### *Name Identification*

The tester had prepared for each of the 11 children a set of 6 white cards. On each card was printed a boy's name in capital letters and in 6 different colours: black, brown, blue, green, yellow, red. Thus the name Charles, for example, was available in 6 colours and so, with 11 children in the class, the tester had 66 cards. She flashed one at a time—at random—to the class, asking 'Whose name is this?' and timed the correct response, which was not 'mine', but 'Charles'. Thus Charles had to answer 6 times, as did every other boy in the class. Thereafter, over the course of up to 2 years, this same procedure was enacted 10-30 times.

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### Letter Matching

A second test was also done, also with cards, and also in 6 colours, but involving only one pupil at a time; this pupil had the test repeated on numerous occasions for up to 2 years.

Charles—let us say—had placed before him a master card with his name printed thereon in capital letters and in a particular colour. On the table were also placed individual cards, each with but one of the letters making up his name and of the same size and colour as in the master card. These were face down on the table. At the click of a stopwatch, he was requested to turn these cards right side up and match them, letter for letter, underneath the master card, and the time was recorded for him to complete the task.

Over the course of many months this test was repeated on numerous occasions and utilizing each of the test colours on the master and individual cards. All 11 boys were tested individually in this manner, most of them for more than a year and some for as long as 2 years.

At the time when testing began, June 1968, 8 of the boys were 10-14 years old and 3 were 5-8 years. All had had IQs in the 35-40 range. Three were mongoloid, the rest having various forms of cerebral damage, pre- or postnatal.

### FINDINGS

#### Name Identification

Eight of the pupils (including the 3 mongoloids) identified their names in 1-2 seconds, and in all 6 colours presented, showing no especial colour preference or disability. Occasionally, over the year or more of testing, there were periods of more tardy recognition, often after a vacation or when a substitute teacher helped with the tests, but there was no particular accent on one or other colour.

Three pupils had especial difficulty in recognizing their names. Paul usually recognized his name in 1-3 seconds, but at several later tests took 6-7 seconds to say 'Paul'. Tyrone had a standard time of 4-8 seconds, and one phase, lasting 2 months, during which he took 10-14 seconds to recognize his name. Michael, throughout the 2-year test period, took anything from 2 to 20 seconds to react to his name. These delays affected all colours.

#### Letter Matching

In matching individual letters to the name on the master card, the 3 mongoloid children completed the task within 1 minute, and in all colours, showing no preference in this regard. The other 5 (making up the original 8 referred to in the first test) performed similarly, matching

letters to name in  $\frac{1}{2}$  -  $1\frac{1}{2}$  minutes, and equally in all test colours. All 8 pupils had periods of poor response—irregular peaks shown on a graph of their performance—when it took 2 or 3 times as long for them to complete their task, and the difficulties affected all colours. Almost all of them, including 2 of the mongoloid children, often placed a letter upside down or back to front, and in all colours. Clearly there were pronounced difficulties with the perception of shape and direction. One mongoloid boy regularly placed the letters back to front and above the master card, but when he put them below the master card they faced correctly.

Paul, Tyrone and Michael commonly completed the task in 1-4 minutes, and also with occasional periods of poorer response, aggravated by clumsy hand movements. Letters were also often upside down, and only Michael showed an especial difficulty in matching red letters to the master card.

### CONCLUSION

Retarded children learn what is required of them in the test situation and after a few trial periods achieve an optimum performance which does not improve with time. In fact, all sorts of distractions and changes render them liable to perform rather more poorly. They show evidence of experiencing difficulties in perceiving the shape and direction of letters.

The use of various colours does not make them more liable to deliver a better performance. While colour preferences may possibly aid normal pupils with perceptual difficulties to recognize letter shape and direction, retarded children are simply too handicapped to make use of colour as a crutch.

### SUMMARY

Eight retarded children, mostly teenagers, and with IQs in the 35-40 range, were repeatedly subjected to tests in a school situation for periods of up to 2 years. They were required to identify their names on flash cards of 6 different colours (black, brown, blue, green, yellow, red) and could usually do so within a second or two. They were also required, on repeated occasions, to match letters in the 6 colours against a master card of their name, and this they did, with irregular skill, within a minute or so. But there was no colour preference and no markedly superior or inferior performance in any colour. This makes colour unlikely as a crutch for teaching retarded children, though it does not mean that colour might not be useful for this purpose in normal children. Retarded children are simply too handicapped intellectually and perceptually.

We wish to thank Mrs E. Kruger, the teacher who regularly assisted in performing the tests.

### REFERENCES

- Gillibrand, J. A. (1970): *S. Afr. Med. J.*, **44**, 12.
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