

The effect of color overlays on the reading ability of dyslexic children

Color overlays were found to reduce eyestrain and headaches experienced when reading, improving reading performance. Dyslexic children may benefit from the use of colored overlays; however, ongoing debates question its use on dyslexic children.^[1-3] An uncontrolled experimental study design was used, analyzing the before, and after effects of colored overlays on reading performance using a modified procedure to that of a previous study.^[4] Participants, with confirmed diagnosis of dyslexia by the educator, were conveniently selected across three conveniently selected schools for the learning disabled. Information documents explaining the nature of the study and consent forms were presented to the parents of each of the participants. Only forty participants returned with signed consent forms.

A prescreening visual assessment, including visual acuity, cover test, accommodation, ocular motilities, and ocular health, was performed on each participant to eliminate visual-related reading anomalies. Ten participants failed this prescreening tests. The Wilkins *et al.* Rate of Reading Test (RRT) prescreening chart was administered thereafter.^[4] Five participants could not identify the words and were excluded from the study. The 25 participants, of whom 56% were males, 44% were females,

56% were Black, and 44% were Indian, with a mean age of 9 ± 1.5 -year-old proceeded to the first reading evaluation using the Wilkins *et al.* RRT chart without the color overlays. As the participant read the researcher simultaneously timed the reader with a stopwatch and followed using the Wilkins *et al.* RRT recording sheet, recording the number of words read, and errors made [Fig. 1]. Reading rate was calculated as the number of words read correctly in 1 min.^[5] A questionnaire containing a simple set of closed-ended questions pertaining to ten symptoms experienced when reading was administered to each participant. Zero to five symptoms were reported across all the participants [Fig 2].

A week later, Wilkins *et al.* RRT was readministered on each of the participants with Intuitive Colored Overlays, 10 different single colors and 19 combinations of double color.^[4-8] The reading was reevaluated and questionnaire readministered. From the 10 single color overlays used, six colors were chosen by only eight participants, with one of each being mint green, pink, purple, and gray, and two of orange and yellow [Fig. 3]. From the 19 double color overlays, eight were chosen by the remainder of the 12 participants, which included two of each of blue-blue, yellow-yellow, orange-orange, and lime green-mint green, while one of each of the rose-rose, rose-orange, purple-purple, and aqua-aqua [Fig. 4]. Five of the participants did not show an improvement with the use of colored overlay.

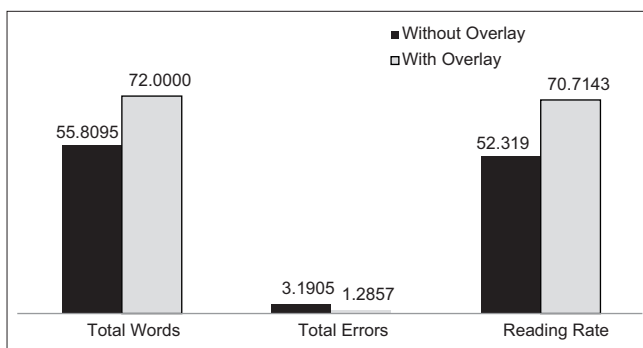


Figure 1: Mean values of the total words read, total errors made, and reading rate with and without color overlays

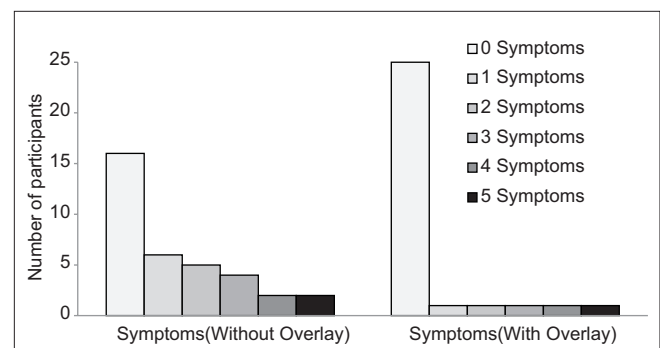


Figure 2: Comparison of symptoms experienced with and without color overlays

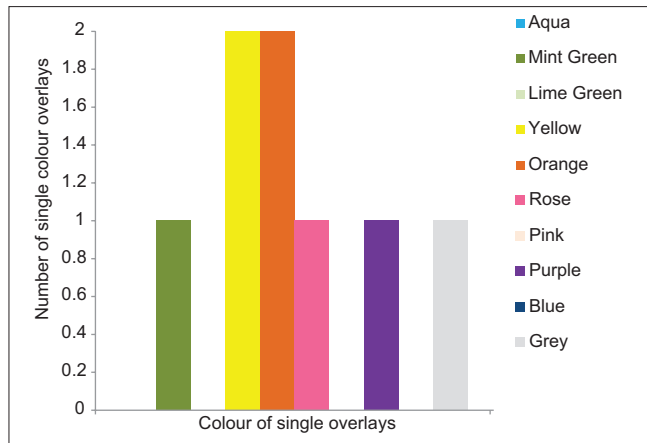


Figure 3: Number of single color overlays given to the participants

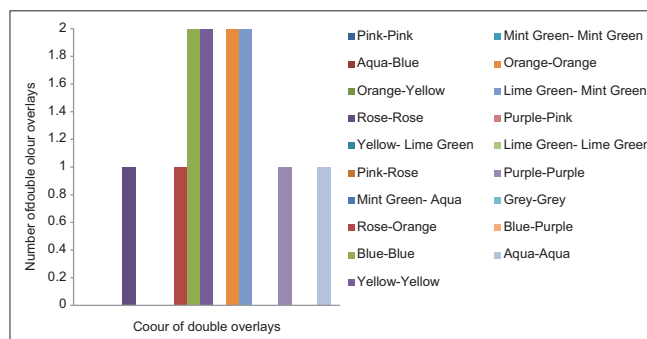


Figure 4: The number of double overlays given to the participants

These colored overlays were given to the participant for 2 weeks. The participant was instructed to place the overlay overall reading material and was closely monitored by the class teacher. Reading was reevaluated with the Wilkins RRT and the prescribed overlay and questionnaire readministered. The mean difference between the number of words read, errors made, and reading rate with and without the colored overlays [Fig. 1] was 16.19 ± 11.25 ($P < 0.001$), 1.90 ± 2.76 ($P < 0.006$), and 18.10 ± 11.80214 ($P < 0.001$), respectively. All symptoms that were experienced when reading without a color overlay were reduced to zero with the use of color overlays [Fig. 2], however as this was an unmasked, uncontrolled study, the placebo effect cannot be ruled out.

Acknowledgments

The authors would like to thank Danke Lenses for supplying the Intuitive Colored Overlays.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Access this article online	
Quick Response Code: 	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_541_16

Cite this article as: Hlengwa N, Moonsamy P, Ngwane F, Nirghin U, Singh S. The effect of color overlays on the reading ability of dyslexic children. *Indian J Ophthalmol* 2017;65:772-3.