

DALTONIANA

NEWSLETTER

OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

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EDITORIAL

This is for the first time since the beginning of Daltoniana in January 1972 a thin issue because of lack of copy.

Therefore I think that it is now time to remember :

1) that in Amsterdam some members promised contributions that they till now never sent, namely :

ARIAS (literature surveys from Spain and South-America;
list of the Commercially available colour vision tests and
accessories from South-America)

CARTA (lit. surv. and comm. avail. tests from Italy)

GRAHAM (lit. surv. from Canada)

GRUTZNER (comm. avail. tests from the GFR)

NEUBAUER (comm. avail. tests from Austria)

ROTH (comm. avail. tests from France)

TAYLOR (lit. surv. from Arch. Ophthal.)

YAGER (lit. surv. from the psychological journals);

they are kindly asked to do so or to convince another person to take over this job;

2) that, according to the Editorial of Nr. 1 of Daltoniana, EVERY MEMBER of the Research Group is asked to contribute by sending :

- correspondance, questions and answers, necrologies,
announcements of meetings or of funds open to applications for
research grants and stipends, offers of joint research pro-
jects, etc.;

- their complete list of publications concerning colour
vision (till now such lists appeared only for 56 members);

- the Official Colour Vision Requirements in their country
(we miss such lists especially for Portugal, Spain, Poland,

Czechoslovakia, Rumania, Yugoslavia, Bulgaria, the U.S.A., Japan, India, Latin America);

- the Commercially Available Colour Vision Tests and Accessories in their country (we miss such lists especially for the U.S.A., the Netherlands, Sweden, Norway, Finland, Spain, Canada, all socialist, latin-american, asiatic and african countries); such lists are necessary for our Standardization Committee;

- literature surveys from theses, books and also from the journals that are still not reviewed, e.g. that of some socialist countries, of Asia (excepted Japan), of military medicine, of traffic medicine and so on.

As for what concerns correspondance, useful exchange of views could be made e.g. concerning the percentage evaluation of working disability due to colour vision deficiencies (on the general labour market). I did not find any reference on this problem which nevertheless seems to be relevant in many medico-legal cases.

Of course, any other suggestion is wellcome. - Guy Verriest.

LITERATURE SURVEY

Increment spectral sensitivity and colour discrimination in the primate, studied by means of graded potentials from the striate cortex, by P. PADMOS and D. VAN NORREN (Institute for Perception TNO, Soesterberg), Vision Res. 15, 1103-1113, 1975.

Electrodes were implanted on the subdural surface of the foveal striate cortex of the macaque monkey. The sensitivity of the responses to monochromatic 300-msec flashes of 5° subtense on white and coloured backgrounds was measured. The resulting increment spectral sensitivities gave evidence for colour opponent interactions, while the spectral sensitivity on a white background was similar to the behavioural data obtained by Sperling and Harwert (1971). A quantitative relation could be established between the obtained electrophysiological data and human psychophysical colour discrimination functions.

The data show that the cortical response is much more sensitive to a colour change than to a luminance change. The shape of the cortical response is remarkably constant for different stimulus wavelengths, indicating that the observed colour-opponent interaction is already established at earlier levels of visual processing. - The Authors.

Absolute threshold for small and large stimuli of variable duration and spectral composition, by L. RONCHI, S. STEFANACCI and L. BARCA, Atti Fond. G. Ronchi 30, 416, 1975.

The radiance-time product, at absolute threshold, is recorded by varying stimulus duration from 10 to 400 msec. The data recorded by the use of a test spot subtending at the eye a few minutes of arc are compared to those recorded by the use of a

2° target. Eccentricity is varied from 7° to 60° along the horizontal meridian of the dark-adapted retina. The plots obtained with either size coincide in some spectral regions, but not in others. The classical model, based on the sole participation of rods, in the response of the dark-adapted retina, if abstraction is made from wavelengths greater than 600 nm, does not seem to explain adequately our experimental data. - Lucia Rositani-Ronchi.

Method for deriving color-difference-perceptibility ellipses for surface-color samples, by R.M. RICH and F.M. BILLMEYER jr. (Dept. of Chemistry, Rensselaer Polytechnic Institute, Troy, N.Y. 12181), W.G. HOWE (School of Management, Rensselaer Polytechnic Institute, Troy, N.Y. 12181), J. opt. Soc. Amer. 65/8, 956-959, 1975.

The authors have developed a method for determining the parameters of color-difference-perceptibility ellipses for surface colors and have evaluated it by use of new visual data. The unit color-difference-perception ellipse thus calculated describes the locus of chromaticities that have approximately a 60% chance of being seen as matches to the color represented by the center of the ellipse. - Ingeborg Schmidt.

Sensitivity of human color mechanisms to gratings and flicker, by C.R. CAVONIUS and O. ESTEVEZ (Laboratory of Medical Physics, Univ. of Amsterdam and The Netherlands Institute for Ophthalmic Research, Amsterdam, The Netherlands), J. opt. Soc. Amer. 65, 966-968, 1975.

Preliminary data suggest that the apparent supersensitivity of the green color mechanism found by Kelly (D.H. Kelly, J. opt. Soc. Amer. 64, 983, 1974) is an artifact that results from the method used to isolate the color systems. It gives only limited separation between the red and green mechanisms. The authors applied a method which permits to modulate single color mechanisms. To verify this they measured spectral sensitivity when presented with stimuli that were calculated to modulate only the red or only the green mechanism. By comparing the sensitivity of normal observers with that of a deuteranope they concluded that their stimulus for the green mechanism also modulated the red mechanism but only one-sixth as much as it does the green. Similar data from a protanope indicated that the stimulus for the red mechanism modulated the green mechanism one-tenth as much as it does the red mechanism. These stimuli were used also to measure the modulation sensitivity of the red and green mechanisms to flicker and to gratings that had sinusoidal luminance profiles. The data show no systematic difference between the sensitivities of the two mechanisms. However supersensitivity was found by duplicating the conditions that Kelly used. But evidently supersensitivity is not a unique property of the green mechanism but depends on the adaptation level of the mechanism that is being measured. - Ingeborg Schmidt.

La sénescence des fonctions visuelles (Aging effects on visual functions), by G. LAVERGNE (Dept. Opth., Univ. of Liège, Belgium), Arch. Ophtal. (Paris) 35, 449-454, 1975.

The author describes the effect of aging upon visual acuity, visual field, color vision and dark adaptation. - A. Pinckers.

Color vision testing in young children. A review, by K.R. ALEXANDER (Illinois College of Optometry, Chicago, Illinois 60616), Amer. J. Optom. 52/5, 332-337, 1975.

None of the commonly available color vision tests with the possible exception of the anomaloscope seems a totally valid color vision screener when used with young children, age 3 to 7 years, since the tests make cognitive demands beyond the capability of the young child. Perhaps the necessity for testing color vision in preschool and elementary school children should be carefully evaluated. - Ingeborg Schmidt.

The Titmus Pediatric Color Perception Test as a color vision screener : a comparative study, by K.R. ALEXANDER (Illinois College of Optometry, Chicago, Illinois 60616), Amer. J. Optom. 52/5, 338-342, 1975.

In the Titmus Pediatric Color Perception Test the patient views a transilluminated slide containing eight blocks of variously colored dots, each block containing the letter E in one of four orientations. The patient is to report the orientation of the E in each block. The test is designed to separate patients into (1) normal (2) conditional pass(mild color deficiency) (3) failure(moderate to severe color deficiency). The test was compared with the Ishihara and the Dvorine plate tests, with a population of adults. The results of the Titmus test are consistent with those of the other tests if certain specific scoring methods are used. Whether or not it is suitable for use with children remains to be investigated. - Ingeborg Schmidt.

New diagnostic pseudoisochromatic plates for dichromats based on subtractive color matches, by J.R. BIRCH (Department of Ophthalmic Optics and Visual Science, City University, London, England), Amer. J. Optom. 52/6, 398-404, 1975.

The new diagnostic plates are based on the precise specification of the colors along the isochromatic lines indicated by the convergence data as obtained with the Lovibond flexible Optic Tintometer for 15 protanopes and 15 deuteranopes. The characteristic color confusions have been used in the selection of pairs of ink for use in the production of six new screen-printed pseudoisochromatic plates incorporating geometric symbols (circles, crosses and triangles) on a dot matrix common to all the plates. Careful selection of the inks and the reflected luminance contrast between symbol and background matrix of dots are critical for the success of the plates. - Ingeborg Schmidt.

Assessment of Color Discrimination Test as aptitude test.
I. Total error scores, by K. FUKAMI (Depart. Ophthal., Kyoto Prefect. Univ. of Med., Kyoto, Japan), Acta Soc. ophthal. jap. 78, 1401-1409, 1974.

The Color Discrimination Test is a modified Farnsworth-Munsell 100-Hue Test made in Japan and consists of 96 color caps divided into four panels. 16 protanopic, 80 deuteranopic, 37 protanomalous and 108 deuteranomalous subjects were examined and the results were compared with those obtained by means of Nagel's anomaloscope, Ishihara's plates, Okuma's plates, the T.M.C. plates and the H-R-R plates. Some subjects were also tested by means of the Panel D-15 and of Ichikawa's Color Perception Lantern.

Only the total error scores are referred here. The high score group does not consist of the cases classified as mild by 3 plates and by the lantern test, and the low score group does not consist of the cases classified as strong by the anomaloscope and D-15 Test. The cases classified as very mild by all other color vision tests show low total error scores and the strong group high ones. However, the intermediate group, to which most of anomalous trichromats correspond, shows all sort of total error scores from low to high.

Consequently, as far the total error scores are concerned, this test is not found to be better as aptitude test than the other color vision tests, also because of its complexity and long passation time. - Yasuo Ohta.

Assessment of Color Discrimination Test as aptitude test.
II. Indices deduced from the error scores in the test, by K. FUKAMI (Depart. Ophthal., Kyoto Prefect. Univ. Med., Kyoto, Japan), Acta Soc. ophthalm. jap. 78, 1431-1437, 1974.

The errors on the Color Discrimination Test of 80 deuteranopes were plotted on the diagram. It was evident that a pair of quadrants (I and III) opposite to each other include the high error scores and that the other pair of quadrants (II and IV) also opposite to each other include the low error scores. The ratio of these pairs (I + III/II + IV) is an index Δ for estimation of the results of this test in the deutan subjects.

By the same procedures an index ∇ was established for the protan subjects.

These indices are justified by the theoretical color confusion of the congenital color vision deficiencies. - Yasuo Ohta.

Ophthalmologic examinations in patients treated with ethambutol, by D. TRUSIEWICZ, Gruzlica I Choroby Pluc 7/661-667 1975.

The author stress the difficulties in performing a wide range of ophthalmological examinations in the patients treated with ethambutol. The significance of the examination of colour

vision in the assessment of the side effects of ethambutol on the optic nerve is emphasized. The Farnsworth 100-hue test is particularly useful and reliable. It allows to observe the course of the toxic process once it set in. The pseudo-isochromatic plates require a separate examination of each eye. The results of the examination of 3 cases are presented. In one of them there was an acquired dyschromatopsia superimposed on a congenital deuteranomaly. - Felicia Jakubik.

Farnsworth 100 Hue-test in diagnosis of ethambutol-induced damage to optic nerve, by D. TRUSIEWICS (Dept. Opth. Central Railway Hospital, Warszawa, Poland), Ophthalmologica 171, 425-431, 1975.

In 3 cases treated with ethambutol early signs of optic nerve intoxication were detected (visual acuity, visual field, F.M. 100 Hue, Ishihara); in one case the acquired color vision defect was superimposed on a congenital deficiency. Treatment of the patients was successful: 2 cases regained normal visual acuity. The author stressed the importance of color vision examination during medication with ethambutol. - A. Pinckers.

Les affections oculaires par les médications générales (Drug induced eye diseases) by H. SARAUX (Dept. Opthal. Hôpital Saint-Antoine, Paris, France), Ann. Oculist. 208, 257-266, 1975.

This is a general review of drug induced ocular manifestations. In early stages of optic nerve or retinal intoxication the F.M. 100 Hue is an important diagnostic tool. - A. Pinckers.

Atrophie aréolaire de la macula (Central areolar choroidal dystrophy), by M. BONNET (Dept. Opthal., Hôpital de la Croix-Rousse, Lyon, France), Arch. Opthal. (Paris) 35, 493-508, 1975.

This paper is a review of central areolar choroidal dystrophy, based upon 24 cases. The visual prognosis depends on the location of the lesion: a) if the atrophic area covers the whole macula color vision is always seriously affected, representing an acquired central achromatopsia; b) if the foveola is not involved color vision also is affected but now we will find an acquired blue-yellow defect or a colour amblyopia without predominating axis. - A. Pinckers.

Cone dark adaptation: the influence of halothane anesthesia, by D. VAN NORREN and P. PADMOS (Institute for Perception TNO), Invest. Opthal. 14, 212-227, 1975.

Cone dark adaptation measured with an electroretinographic method is found to be severely retarded when the subject (human and macaque monkey) is under halothane anesthesia. The degree of retardation depends both on the halothane level and on the bleach history. The effect of bleach history shows a great similarity with psychophysical findings concerning foveal dark adaptation. Interpretation of halothane effects, therefore, is possible in terms of an existing model on cone pigment kinetics. - The Authors.

Colour vision in electric welders, by Z. FILIPIAKOWA, Klinika Oczna 8, 933-938, 1975.

180 welders and 110 welder-assistants have been examined by means of pseudoisochromatic charts, of the anomaloscope and of the Pulfrich photometer. The results show that the percentage of a red colour blindness similar to congenital protanopia was very high. This was particularly evident in the welder-assistants whose protection of the eyes was much worse. This could be due to macular injury caused by the infra-red and visible rays of the electric arc described earlier by the author. - Felicia Jakubik.

Discriminazione cromatica e vetri selettivi, by C. CASTELLINI, Atti Fond. G. Ronchi, 30, 471, 1975.

In the frame of a wide program of research concerning the influence of the spectral composition of the source on chromatic discrimination, further data are now produced. Seven normal individuals are tested with the aid of the 100-hue test both with the naked eye and by placing a colored glass (of the type currently used for the sun spectacles) in front of the eye. Color discrimination is found to be impaired at most when using yellow-range sun glasses. - Lucia Rositani-Ronchi.

A typical case study correcting color deficiency, by H.I. ZELTZER (57 Grant Str., Waltham, Mass. 02154), J. amer. optom. Assoc. 46/6, 622-626, 1975.

A 14 year old vocational high school student was referred for evaluation of his color vision defect and the feasibility of an X-chrom lens. On a first visit his vision and color vision was evaluated. He was a deuteranope. On a second visit the X-chrom lens was fitted and evaluated. A third visit included review and special counseling. From then on the student was treated as a regular contact lens patient. The X-chrom lens improved his color discrimination so that he could continue his career. Noticeable was also improvement of perception of objects which blended with their background. - Ingeborg Schmidt.

The X-chrom lens, by P.E. LA BISSONIERE (812, Miller, Suite "F", Sunnyside, Washington, 98944) Internat. Contact Lens Clinic 1/4, 48-55, 1974.

The effect of the X-chrom lens was compared to that of a red filter of similar spectral transmittance, both used before the non-dominant eye. The 9 subjects (6 deuteranomals of varying degree, 1 protanomal, 1 deuteranope, 1 protanope) made fewer mistakes on the Ishihara than on the HRR plates whether using the X-chrom lens or the red filter, which is explainable by the color arrangements on the plates. 5 subjects passed the Ishihara plates with the X-chrom lens and 7

subjects passed them while using the red filter. Without exception, all 9 subjects failed the HRR plates regardless of whether using the X-chrom lens or the red filter, however 4 subjects improved their classification. The X-chrom lens has a negligible effect on the Holmgren Wool test. On the Farnsworth Munsell 100 Hue test it increased the total error score of a deuteranomal by almost 50%. Neither the X-chrom lens nor the red filter had a measurable effect on visual acuity and there was no measurable disturbance of binocular vision. - Ingeborg Schmidt.

Sunlight productivity and healthy status in poultry, by Z. WACHNIK, Medycyna Weterynaryjna, 7, 107-110, 1975.

On the problem of the influences of light and of colour on the poultries. - Felicia Jakubik.

ANNOUNCEMENT

During its meeting in London at 9 september 1975, the Executive Committee of the AIC (Association Internationale de la Couleur) nominated as recipients of the Judd-AIC-Awards : for 1975 Miss D. NICKERSON; and for 1977, Prof. W.D. WRIGHT, honorary member of our Research Group. Both awards will be presented during COLOR 77 in Troy.