

LITERATURE REVIEW

Current Eye & Vision Science Literature

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Kahn PH Jr, Friedman B, Gill B, Hagman J, Severson RL, Freier NG, Feldman EN, Carrère S, Stolyar A. A plasma display window? – The shifting baseline problem in a technologically mediated natural world. *Journal of Environmental Psychology* 2008;28:192-199.

The authors of this paper sought to investigate the physiological effects of the experience of a high definition television nature view via plasma display. In the introduction, they discussed evidence showing that the experience of nature enhances relaxation, satisfaction, health, etc. The question they addressed in this study is whether a digital real-time view of nature via a high television camera (a “plasma window” as they put it) could have similar measured effects as a real nature view. They compared physiological effects of three conditions: (a) the “plasma window,” (b) a real glass window with the same view, and (c) a blank wall. The study was conducted in a university building and the “nature view” was of a part of the campus with a fountain area, stands of deciduous trees, and a grassy area.

Subjects in the study were 90 undergraduate students ranging in age from 18 to 34 years and with an average age of 20.8 years. Thirty participants were assigned to each of the testing conditions. Heart rate recovery was assessed during and after 30 minutes of

mental tasks performed by the participants. Heart rate was determined from electrocardiogram recordings. In addition, a video camera recorded where the subjects were looking during the experiment.

The rate of recovery of heart rate was significantly faster with the glass window (average 8.2 beats per minute per minute of recovery) than with the blank wall (average 5.3). The recovery rate with plasma window (average 5.2) was not significantly different from that with the blank wall. Another finding of the study was that the amount of time spent looking out the glass window correlated with greater reduction in heart rate, but amount of time looking at the plasma window did not correlate with heart rate reduction.

The authors noted that *the physiological and psychological experience of nature would appear to differ depending on the medium (transparent glass or digital display) through which one views nature.* (p. 198) They suggested that the reasons for the difference are most likely complex, *involving not only technical issues of parallax, pixilation, and 2-D as opposed to 3-D depth perception, but judgments by viewers about what it means for a view to be “real” as opposed to “represented,” and how such judgments feed back into the physiological and psychological system.* (p. 198) Other variables not mentioned by the authors are differences in accommodation and vergence stimuli. The authors caution against the idea that digital representations of nature could provide the same benefits as nature itself.

Palomo-Alvarez C, Puell MC. Accommodative function in school children with reading difficulties. *Graefes Arch Clin Exp Ophthalmol* 2008;246:1769-1774.

This study, conducted at the School of Optometry at Complutense University in Madrid, Spain, compared accommodative parameters in poor readers without dyslexia to those for control children. There were 87 poor readers, ranging in age

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from 8 to 13 years (mean age, 9.2 years), that were tested. The subjects were 30 girls and 57 boys in third through sixth grades. The control group consisted of 32 age-matched controls, also in third through sixth grades. There were 14 girls and 18 boys in the control group. The study subjects were recruited from eleven elementary schools in Madrid.

The children in the poor reader group had been identified as such by their schools. They had also scored at or below the 30th percentile in any of the reading speed and comprehension subtests on a standard Spanish reading test. Their poor reading performance *could not be explained by dyslexia or other psycho-socio-educational or neurological problem (e.g., attention deficit hyperactivity disorder)*. (p. 1770)

Selection criteria for subjects in both groups were: normal IQ, no dyslexia, less than 2 D of myopia or hyperopia, less than 1 D of astigmatism, no strabismus, and best corrected visual acuity of 20/20. The following accommodation tests were performed: (a) NRA and PRA, (b) monocular amplitude of accommodation by the minus lens method, and (c) binocular lens rock accommodative facility. The NRA and PRA were performed with 20/30 letters at 40 cm. Monocular amplitude of accommodation was determined by addition of minus lenses in a phoropter, using 20/30 letters at 33 cm. Binocular accommodative facility was tested with +2/-2 D lenses, using the 20/30 letters on line 5 of the Bernell Acuity Suppression Vectogram (VO9) at 40 cm.

The mean NRA findings were 1.9 D (SD=0.6) in the poor readers and 1.9 D (SD=0.6) in the control group. The mean PRA results were 2.0 D (SD=1.3) in the poor readers and 2.3 D (SD=0.9) in the control subjects. Neither NRA nor PRA showed a statistically significant difference between the two groups.

Monocular amplitude average 9.1 D (SD=2.3) right eye and 9.0 D (SD=2.3) left eye in the poor readers. That compared to 10.5 D (SD=1.7) right eye and 10.5 D (SD=1.8) left eye in the control group. The difference in amplitude between poor and normal readers was statistically significant for each eye ($p=0.001$).

Average accommodative facility rates were 4.9 cycles per minute (SD=3.1) for the poor readers and 6.3 cycles per minute (SD=2.9) for the control group. The difference in means was statistically significant ($p=0.029$).

The authors suggested that: "One clinical implication of these findings is that monocular

accommodative amplitude and binocular accommodative facility should be assessed by an optometric clinician in children whose reading level is poor. However, more studies are needed to investigate the effects of accommodative treatments in young poor readers to determine whether these may improve reading performance." (p. 1773)

Almog Y. A benign syndrome of transient loss of accommodation in young patients. Arch Ophthalmol 2008;126:1643-1646.

The author describes five cases of benign transient isolated paralysis of accommodation. The patients, ages 8 to 21 years, were seen by referral in the years 1997 to 2006 in a neuro-ophthalmology clinic in Israel. All five patients had apparently sudden loss of accommodation resulting in inability to read.


Negative histories were reported for neurological and chronic systemic conditions, use of medications, possible exposure to chemicals, and ocular or head trauma. Normal findings were obtained in each case on distance corrected visual acuity, near point of convergence, base-out prism ranges at distance and near, alternating cover test at 4 m and 33 cm, range of eye movements, pupil size and reaction, dilute (0.125%) pilocarpine test, and slit lamp examination. Four of the five patients had magnetic resonance image (MRI) studies of the brain and orbit, and three of the patients also underwent examination by a pediatric neurologist.

Four of the five patients required +2.00 to +3.00 D additions to read J1 letters at 33 cm. The other patient had a near point of accommodation of 40 cm. Each of the five patients received reading lenses, either as single vision plus spheres or as multifocals. There were all reported to read successfully with the reading glasses. Some months later (ranging from 3 to 14 months in the five patients) accommodation returned to normal. They were all then able to read J1 letters at 33 cm without correction. Near points of accommodation were reported for three of the patients after recovery. It was 10 cm for two of the patients and 12 and 13 cm in the two eyes of the third.

The author was unable to identify the etiology of the transient loss of accommodation in these five patients. The author observed that the similarity of the five cases suggests a specific medical entity, with diagnostic features which "include (1) the patient being a child or young adult, (2) complete or nearly complete bilateral

symmetric paralysis of accommodation, (3) a relatively sudden onset, (4) preserved convergence, (5) equal and normal reacting pupils, (6) negative pilocarpine, 0.125%, test results, (7) normal ocular examination results, (8) no systemic or neurological disease, (9) relief of patient's difficulty with near glasses correction, and (10) recovery of normal accommodation within a few months." (p. 1645)

THE CRITICAL LINK BETWEEN
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LEARNING



- 1 out of 4 children struggle with reading and learning because of undiagnosed vision problems.
- Problems with attention, reading, and learning are just a few of the symptoms that can be improved when vision disorders are found and treated appropriately.

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CHIEF OF REHABILITATION SERVICES

The State University of New York State College of Optometry invites nominations and applications for the position of Chief of Rehabilitation Services. This individual will assume the overall responsibility for a major clinical service within the University Eye Center, the clinical facility of the college. This service consists of visual therapy, head trauma, learning disabilities, low vision, and psycho-educational testing and services. Together, these units diagnose and treat approximately 15,000 patient visits annually. Additionally, this individual will be involved in assuring quality patient care, clinical teaching, staff mentoring, marketing, organization and patient flow, clinic staffing, service communication and budgeting, and collaboration with other clinical, academic and research services within the college. The Rehabilitation Service has a scholarly mission within the college's overall academic program and the candidate will need to foster and promote effective clinical education within the service.

The successful candidate must be an effective leader, working well with faculty and staff and must be an excellent communicator capable of mentoring clinical faculty and integrating exciting and innovative changes into the Rehabilitation Service. Candidates should have substantial experience in both rehabilitation and administration with additional experience in clinical teaching and/or clinical research. A Doctor of Optometry degree is required. The candidate should have advanced training in rehabilitation.

Applicants should submit a letter of interest, CV, and the names and complete contact information for three references by December 1, 2009. Confidential inquiries, nominations, and application materials should be directed to:

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