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ELECTRORETINOGRAPHIC CHANGES IN AGED PIGEONS.
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Photopic electroretinograms, either to full-field light flicker (PERGs) or to contrast reversal of square-wave gratings (PERGs) have been recorded in pigeons aged 2 years (n=5) and 10 years old (n=6). Hydration pectoral diameter, ophthalmoscopic appearance of the retinal fundus and optic media, and refractive state were comparable in younger pigeons. VpI functions of individual PERG components (a-wave, b-wave and oscillatory potentials) displayed significantly lower slopes in the older birds than in the young, which suggests a reduction in retinal gain. PERG amplitude also was significantly lower in the older birds across a range of spatial frequencies (0.2 — 8.8 c/deg). Estimated visual acuity based on the extrapolated high-frequency cut-off was 18 c/deg in the younger birds and 7.8 c/deg in the older birds. These results were in agreement with psychophysical data (Rosos et al, 1989) and retinal morphology changes (Rosos et al., 1989) which indicated age-related losses in visual acuity, photoreceptors and retinal ganglion cells. Since these findings are comparable to those reported for humans, the results suggest that pigeons may serve as a useful model for human visual aging.

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SENSORY ENCODING ASPECTS OF MENTAL ROTATION IN AGING.
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The speed of mental rotation is frequently cited, in the literature on performance decrements related to human aging, as an indicator of neural processing speed and efficiency. Such examples are typically cited in a normative way, that is, with the assumption that, barring significant visual impairment, sensory encoding plays little or no role in performance. Fast scanner (FST) of stimuli from a commercially available test of figure rotation ability indicated primarily for spatial frequency, high contrast, high frequency stimuli. In the present study, the stimuli were modified by replacing the original bold figures with outline designs. FST indicated that the modified stimulus was significantly reduced contrast, increased high spatial frequency, and increased low spatial frequency. Group (n=8) and age (n=6) analyses were employed to discern the effects of age on spatial frequency and contrast. The results suggest that sensory encoding aspects of mental rotation tasks, specifically in respect to the spatial frequency and contrast of the stimulus, contribute significantly to the age-related decrement in performance of younger adults. In contrast, the analysis of low spatial frequency stimuli diminished performance in the elder subjects, a finding which is somewhat in conflict with reported temporal processing deficits in aging.

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Clinicians attempt to identify non-invasive tests that are not only scientifically sound, but cost-effective and reliable, and have a high degree of specificity and sensitivity. Disease may require sophisticated evaluations, which are often unnecessary. Reliability and validity of tests must be calibrated with reported disease, indicating a difference between the two groups even greater at low luminance. The task was also able to discriminate the two subjects who reported healthy vs. these reporting diabetic eyes. The high Contrast Echegn chart was unable to differentiate these two older subgroups. Complete measurement could not be obtained for the Intermediate Contrast Echegn chart because of high failure rates of the elderly at the lower luminance levels. Our results show that the Pelli-Robbins chart is a very useful screening test for the elderly with or without eye disease. Supported by UG1 Grant: #001722

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ASSESSING AGE-DIFFERENCES IN MOTION PERCEPTION USING SIMPLE OSCILLATORY DISPLACEMENT VERSUS RANDOM DOT CINEMATOGRAPHY. Frank Schellenberg, Erika Hiris, Jeffrey Wayne Hargreave Williams (Psychology Department, Oakland University, Rochester, MI 48096); and Julie Brennan (M.S. School of Medicine, New York, NY 10029).

Recent investigations have suggested that motion detection performance declines with increasing adult age. However, most of these findings, age-differences in motion perception were examined using two diverging paradigms: 1) the assessment of oscillatory motion detection thresholds (OMDT) for a small spot which was momentarily displaced 8-16" along the vertical meridian, and 2) the assessment of the threshold for discriminating the direction of motion introduced into a random dot cinematography (RDC). OMDTs were collected using a 2-interval forced-choice staircase procedure. Performance thresholds for the discrimination of motion dimension using RDC stimuli employed the method of constant stimuli. Each RDC consisted of 8 stimulus frames of 1.75 dots presented at a rate of 30 Hz. A random displacement of 0.14 degrees was added to the initial frame position on the following successive frames. A correlated motion signal could be added to the RDC stimulus by varying the percentage of dots which moved downward across stimulus frames. Performance curves relating percentage correct discrimination (up vs. down) at a function of the amount of correlated motion signal were used to compute the 75% threshold. Twenty young (mean age = 23.3) and 20 older (mean age = 69.2) healthy volunteers participated in the study. Older adults required significantly higher levels of displacement to reach threshold on the OMDT task (37.7 vs. 51.7 arcsec, F(1,35) = 18.7, p<0.0001). However, on the RDC task only females demonstrated an age mediated decline in motion perception (13.8% vs. 21.9%, P(1,35) = 2.5, p=0.12). Further experiments which examined OMDT and RDC thresholds under conditions of optical blur revealed that the older subjects required significantly more blur to mediate by age-related neural changes rather than optical factors.