

The eyes have it: Men do see things differently to women

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The way that the visual centers of men and women's brains works is different, finds new research published in BioMed Central's open access journal *Biology of Sex Differences*. Men have greater sensitivity to fine detail and rapidly moving stimuli, but women are better at discriminating between colors.

In the brain there are high concentrations of <u>male sex hormone</u> (androgen) receptors throughout <u>cerebral cortex</u>, especially in the <u>visual</u> <u>cortex</u> which is responsible for processing images. Androgens are also responsible for controlling the development of neurons in the visual cortex during embryogenesis, meaning that males have 25% more of these neurons than females.

Researchers from Brooklyn and Hunter Colleges of the City University of New York compared the vision of men and women aged over 16 from both college and high school, including students and staff. All volunteers were required to have normal color vision and 20/20 sight (or 20/20 when corrected by glasses or contact lenses).

When the volunteers were required to describe colors shown to them across the <u>visual spectrum</u> it became obvious that the <u>color vision</u> of men was shifted, and that they required a slightly longer wavelength to experience the same hue as the women. The males also had a broader range in the center of the spectrum where they were less able to discriminate between colors.



An image of light and dark bars was used to measure contrast-sensitivity functions (CSF) of vision; the bars were either horizontal or vertical and volunteers had to choose which one they saw. In each image, when the light and dark bars were alternated the image appeared to flicker.

By varying how rapidly the bars alternated or how close together they were, the team found that at moderate rates of image change, observers lost sensitivity for close together bars, and gained sensitivity when the bars were farther apart. However when the image change was faster both sexes were less able to resolve the images over all bar widths. Overall the men were better able to resolve more rapidly changing images that were closer together than the women.

Prof Israel Abramov, who led this study commented, "As with other senses, such as hearing and the olfactory system, there are marked <u>sex</u> <u>differences</u> in vision between men and women. The elements of vision we measured are determined by inputs from specific sets of thalamic neurons into the primary visual cortex. We suggest that, since these <u>neurons</u> are guided by the cortex during embryogenesis, that testosterone plays a major role, somehow leading to different connectivity between males and females. The evolutionary driving force between these differences is less clear."

More information: Sex & vision I: Spatio-temporal resolution Israel Abramov, James Gordon, Olga Feldman and Alla Chavarga, *Biology of Sex Differences* (in press)

Provided by BioMed Central

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