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NON-LOCAL COLOR INDUCTION UNDER CHANGING ADAPTATION DEPENDS ON CHROMATIC CONTRAST. T. Wachtler*, T.D. Albright, T.J. Sejnowski. The Salk Institute for Biological Studies, La Jolla, CA 92037

In a previous study of the influence of peripheral color patches on the color appearance of a central test field (Wachtler et al 1997, *IOVS* 38,4:898) we found a nonlinear inducing effect: Although chromaticity changes in the periphery alone did not lead to an appearance change in the test field, they modulated the degree of appearance change induced by a chromaticity change of the background. Here we report on the properties of this modulatory effect. Using a forced-choice method we measured quantitatively the effect of chromaticity changes in peripheral color fields during changes in background color. The color fields were 1.5° squares, placed between 2.5 and 10 degrees from the central 1.5° test field. Background color changed by a cone contrast of 0.1. We found that changing the number (and total area) of the color fields did not change their effect: We obtained the same results for 4, 8, and 16 fields. However, the effect of the fields varies with their contrast relative to the background: When the color change in the fields is larger than in the background, the induced appearance change is enhanced; when it is lower, induction is reduced. Varying the contrast between background and color fields by a cone contrast of 0.2 resulted in a modulation of the induced appearance change between 12 and 23 percent, depending on observer. Recently it has been shown that color adaptation depends on the variance of colors in the scene (Brown & MacLeod 1997, *Curr. Biol.* 7:844). Our results are consistent with this finding, and furthermore show that this adjustment takes into account chromatic information from a relatively large part of the visual field. It does not result from adaptation during sampling of the scene over time, but is due to an almost instantaneous mechanism. These properties match the behavior of color selective cells in V4 as described by Desimone et al. (1990, *J. Neurosci.* 10:3369). We suggest that the function of this mechanism is to provide for rapid adjustment following illumination changes, in order to process efficiently the new ensemble of chromaticities in the visual field. (Supported by the Howard Hughes Medical Institute and the Sloan Center for Theoretical Neurobiology)