

SPATIAL INTERACTIONS IN COLOR PERCEPTION

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Purpose. We investigated how the perceived color of a test field is affected by the spatial arrangement of other colors in the scene.

Methods. A grey square field (2° width) was presented on a homogeneous background (26 cd/m^2) on a CRT screen. In the vicinity of this test field, four squares were displayed. In every trial, the color of background, surrounding fields, or both, was changed along a red-green axis while a random-dot mask appeared for 500ms. In a forced-choice task, subjects had to indicate whether the test field in the changed scene appeared redder or greener than before the change. By choosing different colors for the test field in the changed scene, that color was determined that matched the test field in the unchanged scene.

Results. When background color was held constant, subjects demonstrated a high degree of color constancy (90% and more), and there was a weak effect of the surrounding color fields on the appearance of the test field. When background color changed from trial to trial, color constancy was weaker and we found a stronger relative dependence on the color of the surrounding fields. In both cases, changing the distance of test and surrounding fields, between 1° and 10° , had no effect on the appearance of the test field.

Conclusions. Color appearance is largely insensitive to a change in spatial arrangement of other colors in the vicinity. This indicates the contribution of a long-range integrating mechanism with flat spatial characteristics.

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