Scale invariance of chromatic similarity and properties of chromatic motion examined with spatial and temporal chromatic plaids

Bimler, DL[1]

[1] Health and Human Development, Massey University, Palmerston North, New Zealand

Chromatic plaid stimuli are created by superimposing two sinusoidal spatial patterns, each oscillating between a different pair of equiluminant hues; one pattern runs from lower left to upper right, the other from lower right to upper left. The dominant diagonal trend in a plaid depends on the less similar of the two hue pairs dominating the other pair, in a process of monocular rivalry, and provides a 'tetradic' judgement of colour similarity. Fifty-six such plaids were constructed from various combinations of 16 hues, with spatial luminance noise added to remove residual luminance artefacts. These stimuli were presented at a range of spatial wavelengths from 1° to 10° / cycle, and analysed with individual-differences multidimensional scaling, to test whether the relative salience of the two cardinal axes of the equiluminant colour plane varies with spatial scale. Such variations were a possibility since the detection threshold for chromatic contrast – as a function of spatial frequency – is not necessary identical for the L-M and S_0 axes. Replacing one spatial dimension in the plaids with temporal modulation created stimuli in the form of moving waves rather than stripes, with ambiguity of motion rather than diagonal direction. These allowed the chromatic contribution to motion perception to be probed at various scales and angular velocities.