

Colour vision: From sensation to science

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Abstract

Throughout history there have been different approaches to pursuing a better understanding of colour and colour vision, depending on the phenomena one wanted to explain. For instance, although seemingly irreconcilable, the opponent-colour theory of Hering (with its yellow-blue and red-green chromatic pairs) and the three-colour theory of Young-Helmholtz (with red, green, and violet as mixture primaries) did in fact illuminate different aspects of colour vision. Thomas Young and Hermann von Helmholtz set out to explain the qualities of colours, but with the help of James C. Maxwell this theory eventually became a three-receptor theory describing additive colour mixtures and colour matches. The three-receptor theory is the foundation of trichromatic colour measurements and a thriving colour technology. Ewald Hering, who also had colour perception as his main concern, appears to have recognized the distinction between receptor excitations and perception. He postulated opponent physiological processes as basis for the two pairs of chromatic colours. Today these theories are combined in an attempt to understand how colour is processed in the higher brain centres.

Keywords: Colour vision, opponent-colour theory, three-colour theory, three-receptor theory, neuroscience.

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