

## Some Theories of Color Vision

The power of a scientific theory: prediction...a sense of comfort in the universe  
Falsification is more powerful and verification.

Example:

the Three-component, or trichromatic, or Young(1802)-Helmholtz(1850) theory-  
Assumes three types of cones with different spectral sensitivities  
These three color cones generate neural signals that are transmitted directly to the brain for interpretation  
Primary colors: red, green, violet  
Located in the cone pigments  
Fails to explain the way some color stimuli appear to an observer.

Opponent-colors theory by Hering(1874)  
Assumes the existence of visual processes capable of generating neural signals of two opposite kinds, depending upon the wavelength of the light.  
Primary colors: Red-green, blue-yellow, white-black  
Located in the optic nerves  
Fails to explain certain types of "color blindness"

Zone theory by Müller(1930) and Judd(1949)  
Combines features of the previous two theories  
First zone assumes three different kinds of cones which absorb the light in the photopigments and convert it to electrical signals. (Young-Helmholtz)  
Second zone assumes the cone signals are coded into the neural network that generates three new signals, one achromatic signal and two antagonistic signals. (Hering)  
Third zone is located in the brain where the signals are interpreted in the context of all the other visual inputs.