Lightness perception

Perceptual consequences of center-surround antagonism:
  1. Neural signal depends on local intensity as well as surrounding intensity
  2. Signal emphasizes contrast borders; de-emphasizes homogeneous regions

Lightness illusions:
  - Simultaneous lightness contrast
  - Cornsweet edge
  - Mach bands
    - explanation using ganglion-cell processing
  - Hermann grid
    - explanation using ganglion-cell processing
    (+ effect of looking directly at an intersection)

Lightness effects not explainable by retinal processing alone:
  - Adelson's transparent diamonds
  - Adelson's transparent version of Koffka's ring

Brightness: How much light appears to be coming from a given location (perceived luminance / light intensity)
Lightness: How light or dark a surface appears to be intrinsically (perceived reflectance)

Lightness constancy: Perception of surface lightness is preserved despite a change in illumination that alters how much light is actually projected to the eyes

Example: Light intensity projected from black print in sunlight
> light intensity projected from a white sheet under shadow / bulb-lit room

Wallach's ratio rule: Ratios of light intensity (luminance) values are preserved across illumination boundaries.

The visual system uses luminance ratios ("contrast") to assign brightness and lightness
  - explanation of simultaneous lightness contrast using luminance ratios