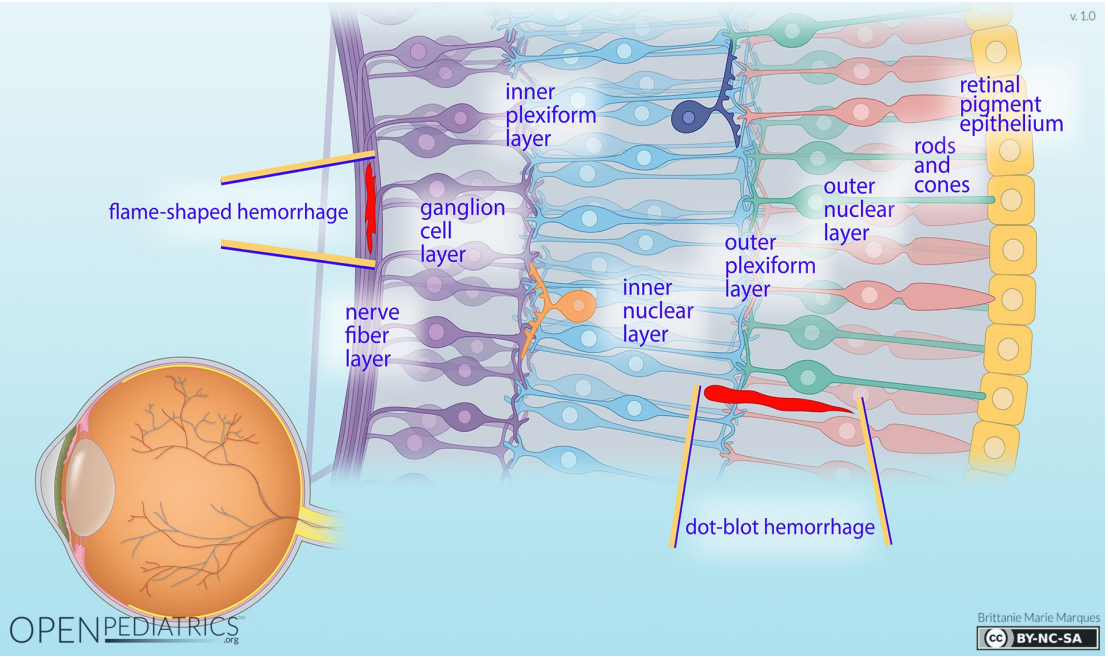
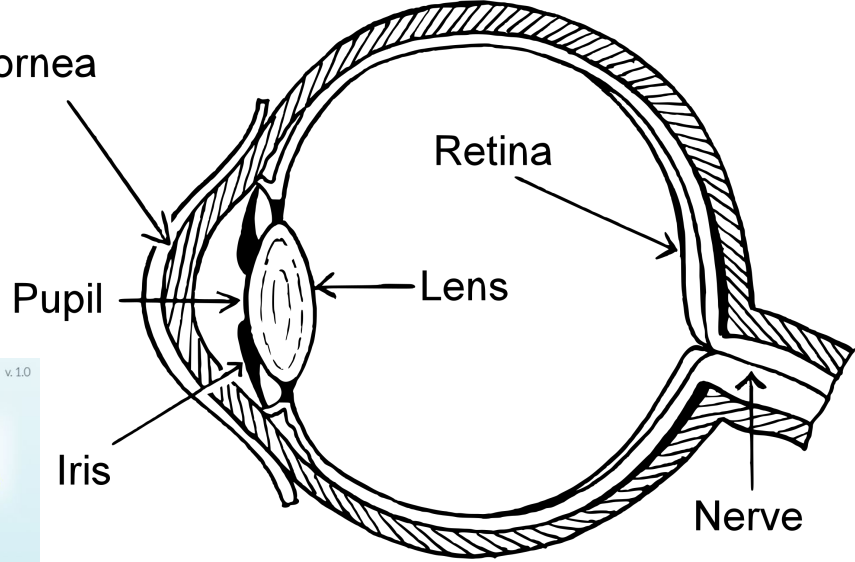
Neuroscience of Optical Illusions

Announcements

- No meeting next week & no Neurology Grand Round
- Dr. Smaers: Evolution of the Human Brain
  - Wednesday, November 29th
  - 7pm Life Sciences 038
- Research Workshop meeting
  - Thursday, November 16th
  - 7pm SAC 312
  - Explore scientific literature through Stony Brook EEG and fMRI studies!

The Visual System





https://openclipart.org/image/2400px/svg_to_png/261647/EyeDiagram.png-https://www.openpediatrics.org/sites/default/files/assets/Hemorrhages-within-Layers-of-the-Retina1.jpg

What does it mean to “see”?

https://www.braingle.com/images/illusions/26745.gif

https://www.moillusions.com/wp-content/uploads/2012/10/old_man_young_couple_illusion.jpg

Vision is subjective

Figure 4.2 Kanizsa triangle illustrating the Gestalt law of closure.

Figure 4.3 Panda illustrating the Gestalt law of closure. © *WWF. With permission from WWF.*

Our brain often has to fill in all the gaps and ambiguities in order to make sense of the world!

http://scitechconnect.elsevier.com/wp-content/uploads/2014/10/Tryon-Perception.jpg

Perception of color

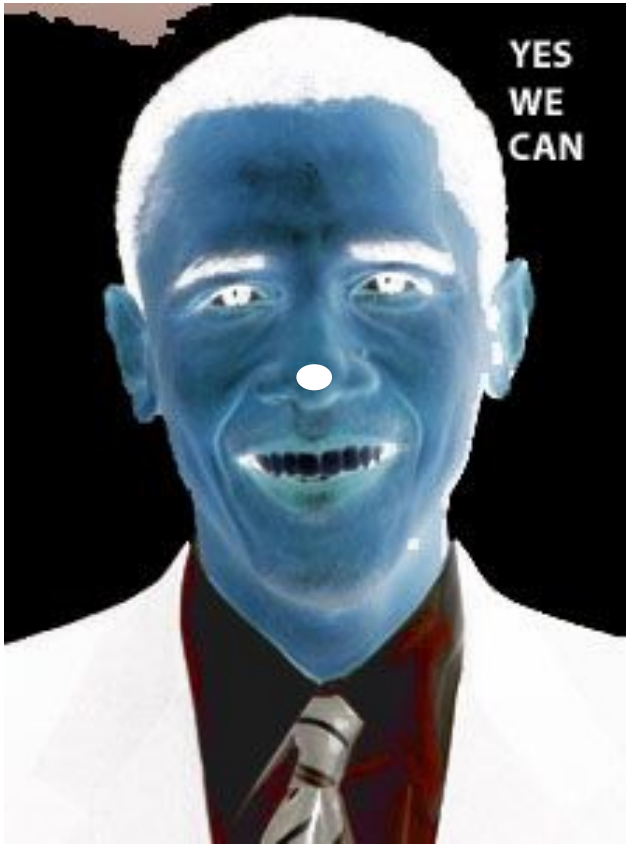
Trichromatic theory

- 3 types of cones (S M L) help us see color

Opponent process

- 3 sets of cells receive info on paired colors
- red/green black/white blue/yellow

https://upload.wikimedia.org/wikipedia/en/a/a8/The_Dress_%28viral_phenomenon%29.png



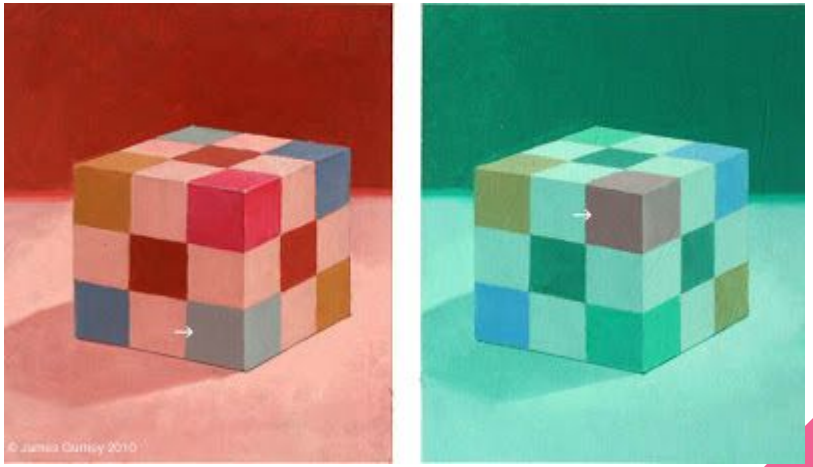
http://mesosyn.com/mental8-15a.jpg

Perception of color

Neither trichromatic nor opponent process explains color constancy

Retinex Theory

- Color is determined by the amount of light of different wavelengths is reflects



http://2.bp.blogspot.com/_Eiwce13X738/S1HtRbGxMQI/AAAAAAAAHxs/qrWwQyhdwFI/s400/Color-Constancy_sm.jpg

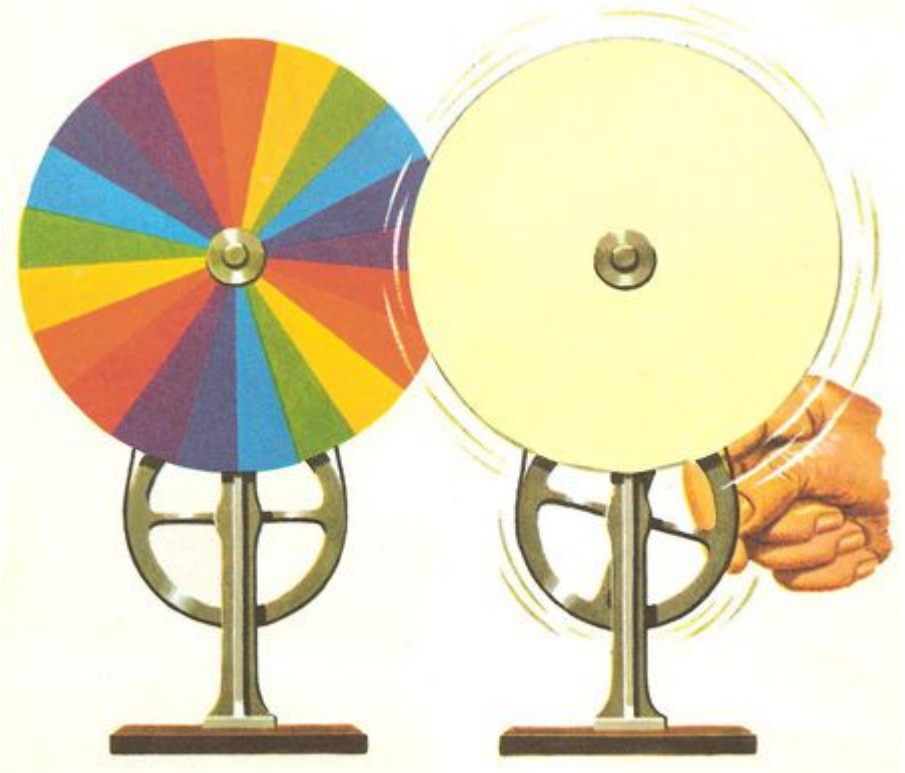
Newton’s Disks

Part of Newton’s experiments with white light

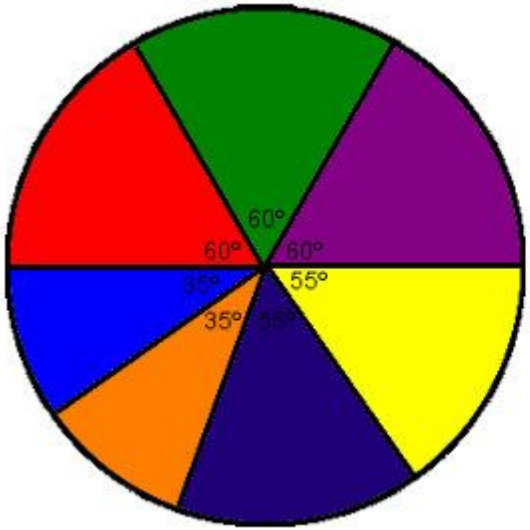
- White light through a prism refracts into a rainbow

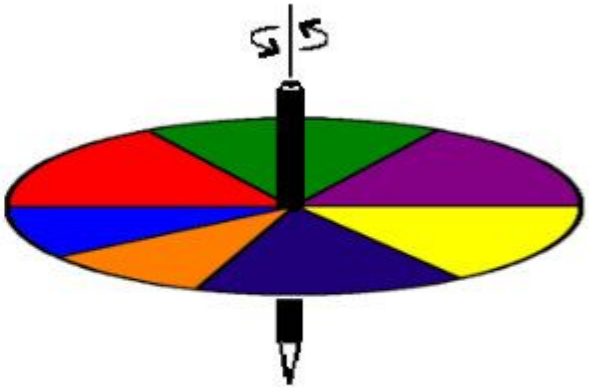
Rotating disk with segments of different colors

- When you spin, it appears white
- Colors blur together too fast for the brain to process each color



Make your own Newton’s disk!





http://restlessmindboosters.blogspot.com/2011/11/newton-discs-how-do-they-work.html

November 29th, 7pm Life Sciences 038

Evolution of the Human Brain With Dr. Jerome Smaers