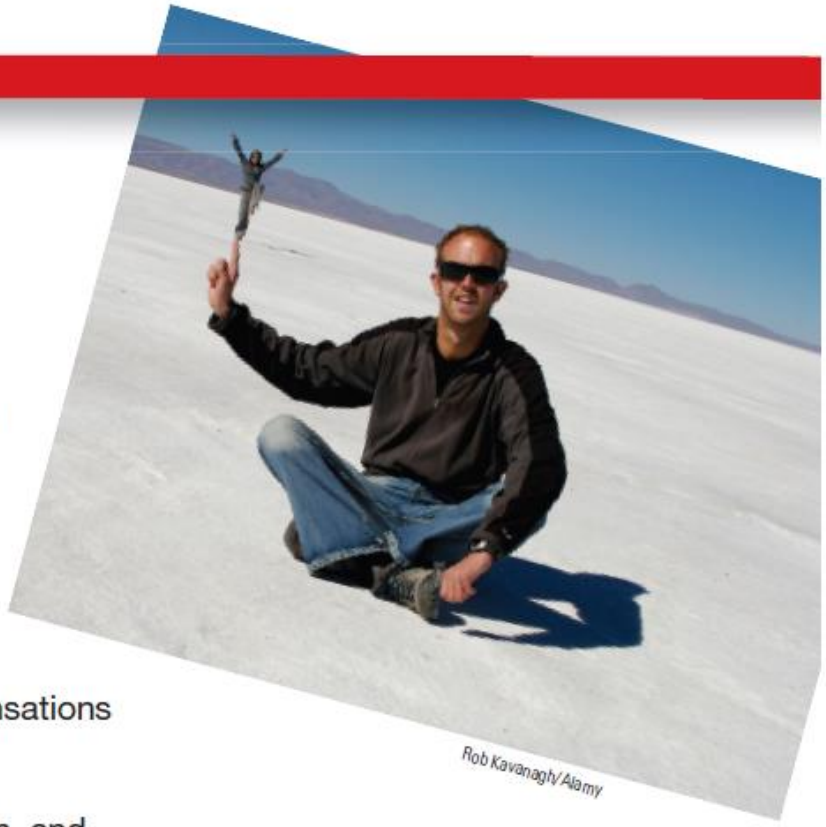
Unit IV: Sensation & Perception

Module 19

Vision Organization & Interpretation

Module 19

Visual Organization and Interpretation


Rob Kavanagh/Alamy

Module Learning Objectives

19-1 Describe Gestalt psychologists' understanding of perceptual organization, and explain how figure-ground and grouping principles contribute to our perceptions.

19-2 Explain how we use binocular and monocular cues to perceive the world in three dimensions and perceive motion.

19-3 Explain how perceptual constancies help us organize our sensations into meaningful perceptions.

19-4 Describe what research on restored vision, sensory restriction, and perceptual adaptation reveals about the effects of experience on perception.

Visual Organization

19-1

Perceptual Organization

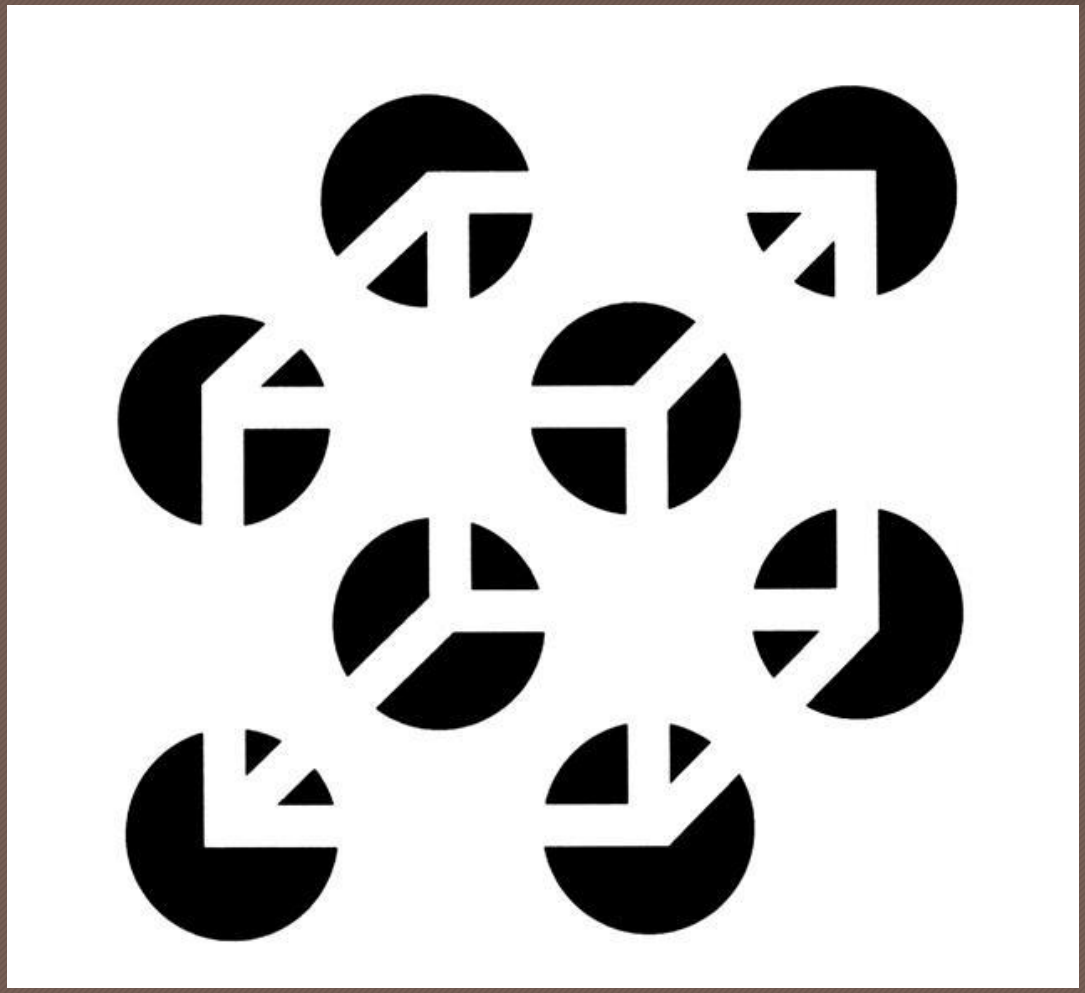
19-1

How do we form meaningful perceptions from sensory information?

A group of German psychologists noticed that when given a cluster of sensations people tend to organize them into a gestalt, or an organized, meaningful whole.

What Do You See?

19-1



Necker Cube
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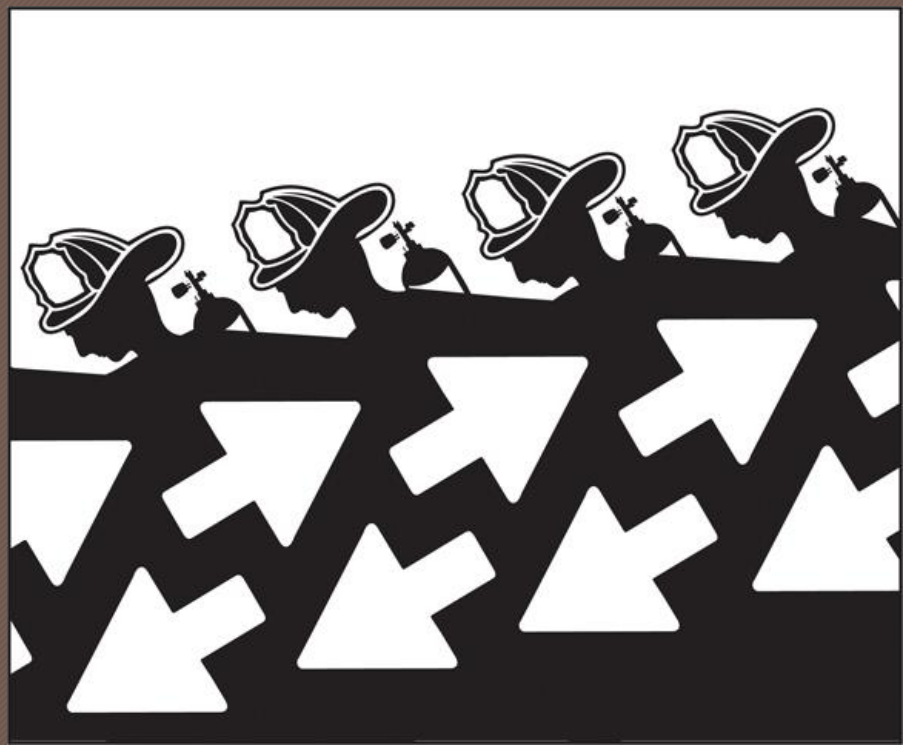
Form Perception

19-1

Our brain must recognize objects as distinct from their backgrounds:

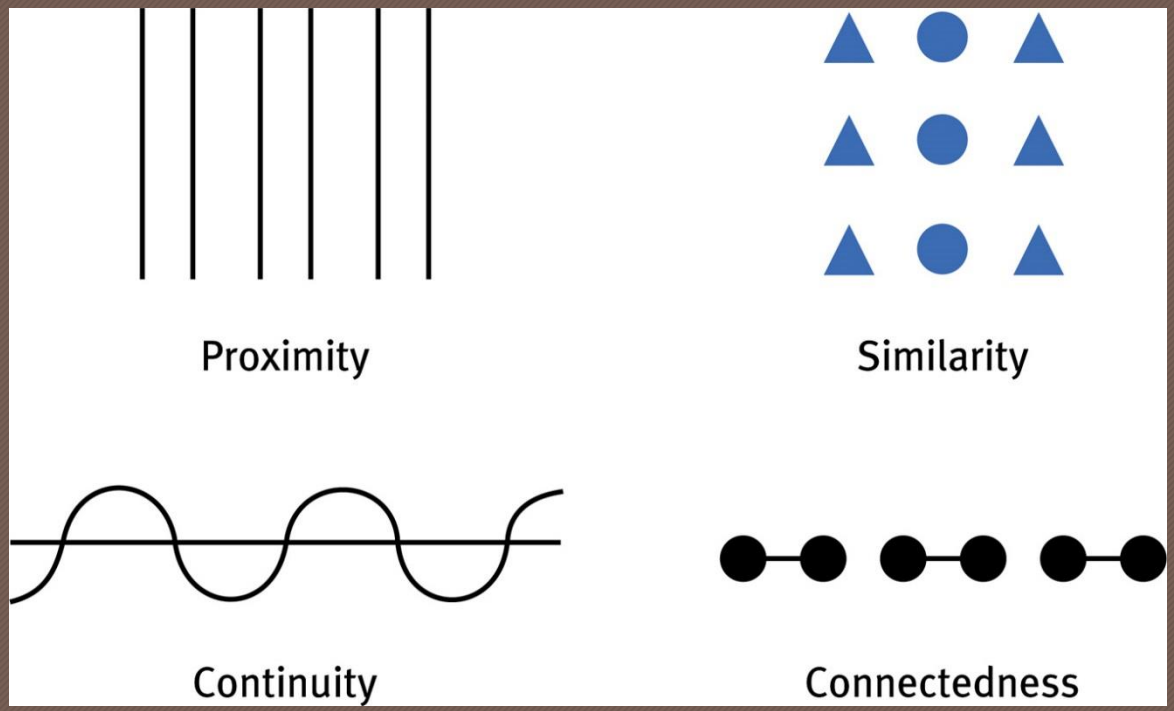
- The objects are figures.
- Their surroundings are the grounds.

The same stimulus can trigger more than one perception, and allow the figure-ground relationship to reverse.

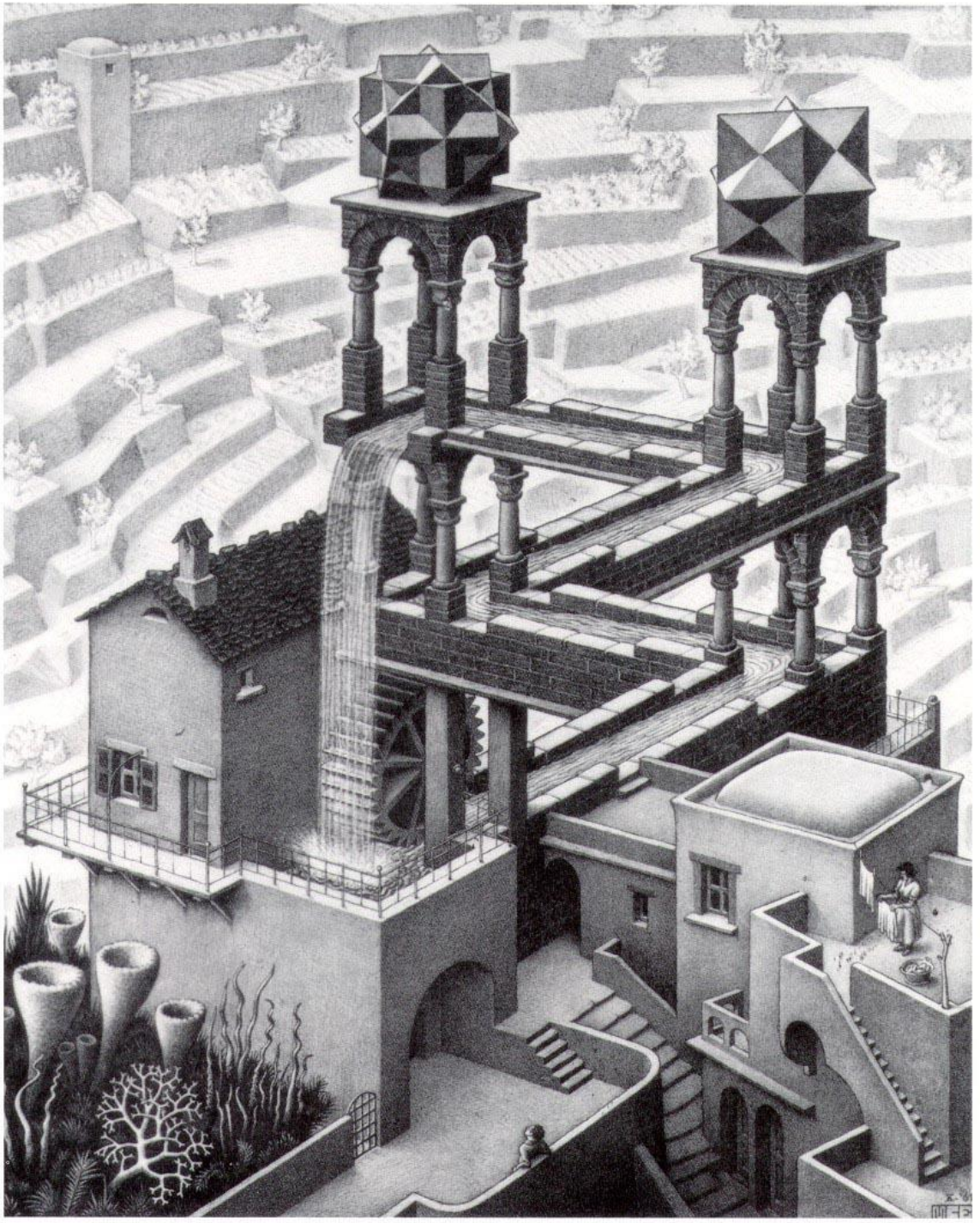


Grouping

After distinguishing the figure from the ground, our perception needs to organize the figure into a meaningful form using grouping rules.



M.C. Escher



Depth Perception

19-2

Depth Perception

Depth perception –the ability to see objects in three dimensions although the images that strike the retina are two dimensional- it enables us to judge distances.

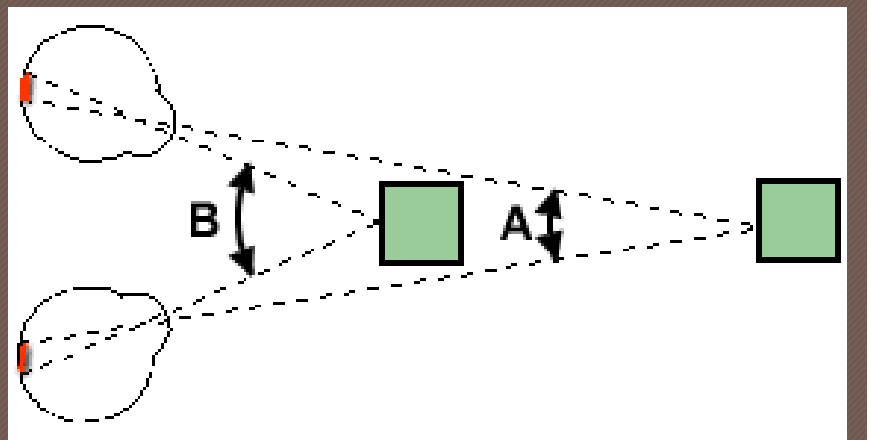
Cat with no depth perception:

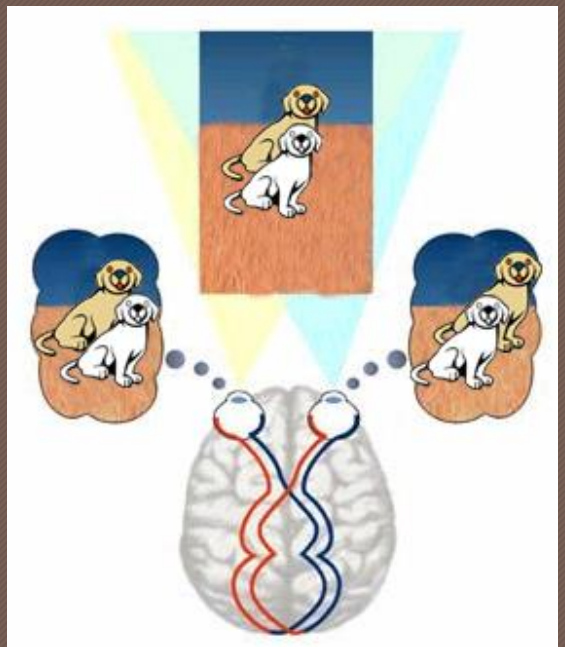
Visual Cliff

Gibson and Walk (1960) suggested that human infants (crawling age) have depth perception using the visual cliff demonstration:

Binocular Cues

- Binocular cues are depth cues that depend on two eyes.
- Retinal disparity, which is the distance between the images received from the two retinas, is a binocular cue that allows us to perceive depth. The greater the disparity between the two images, the closer the object.

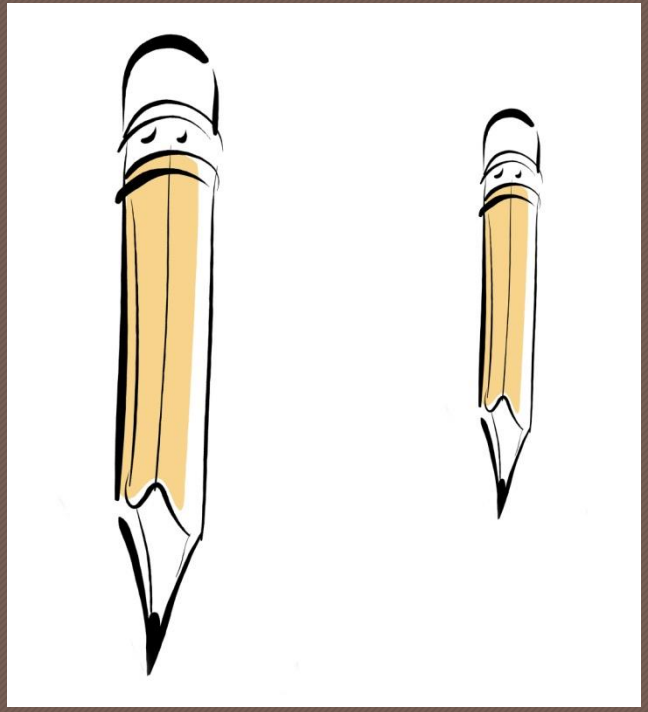




Monocular Cues

- Monocular cues are depth cues that are available to either eye alone.

- Relative Size: If two objects are similar in size, we perceive the one that casts a smaller retinal image to be farther away.

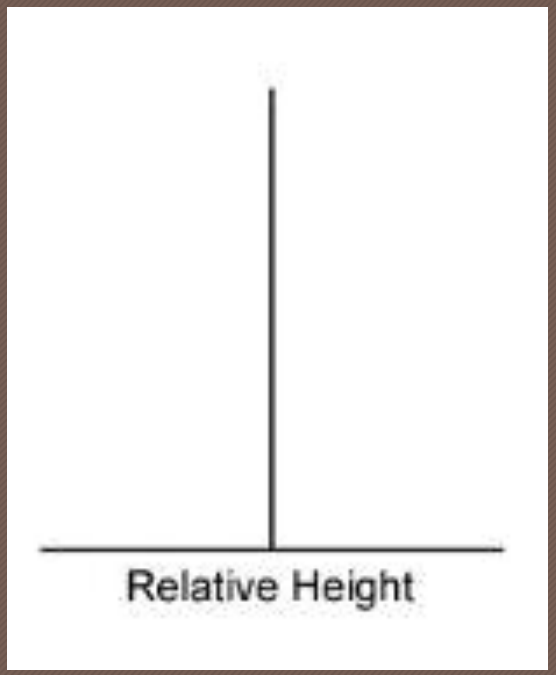


Monocular Cues

Interposition: Objects that block other objects tend to be perceived as closer.

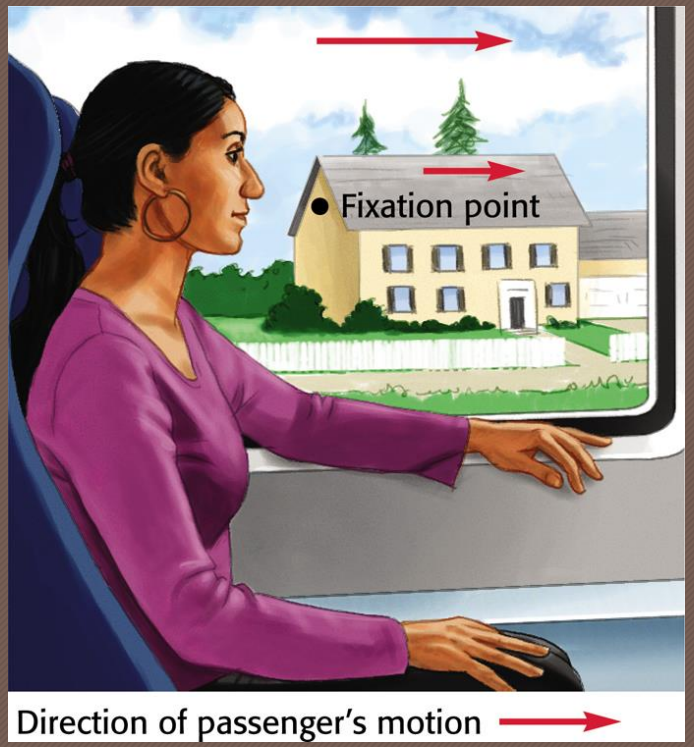
Monocular Cues

Relative Height: We perceive objects that are higher in our field of vision to be farther away than those that are lower.



Monocular Cues

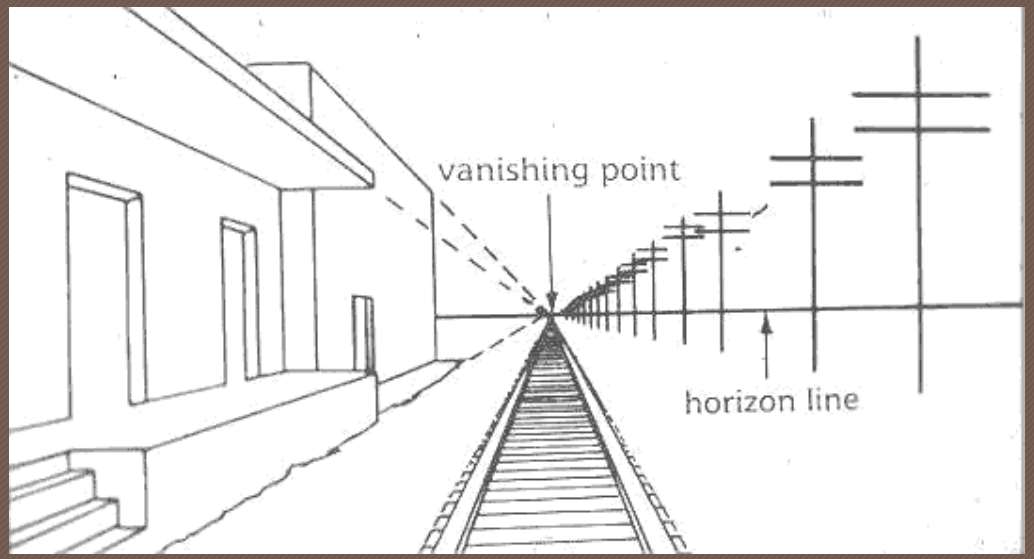
Relative motion: Objects closer to a fixation point move faster and in opposing direction to those objects that are farther away from a fixation point, moving slower and in the same direction.



Monocular Cues

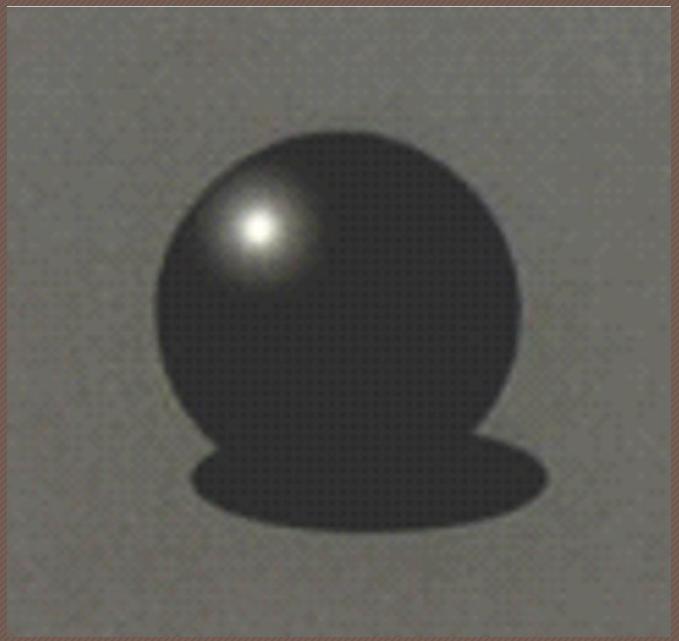
Linear Perspective: Parallel lines, such as railroad tracks, appear to converge in the distance.

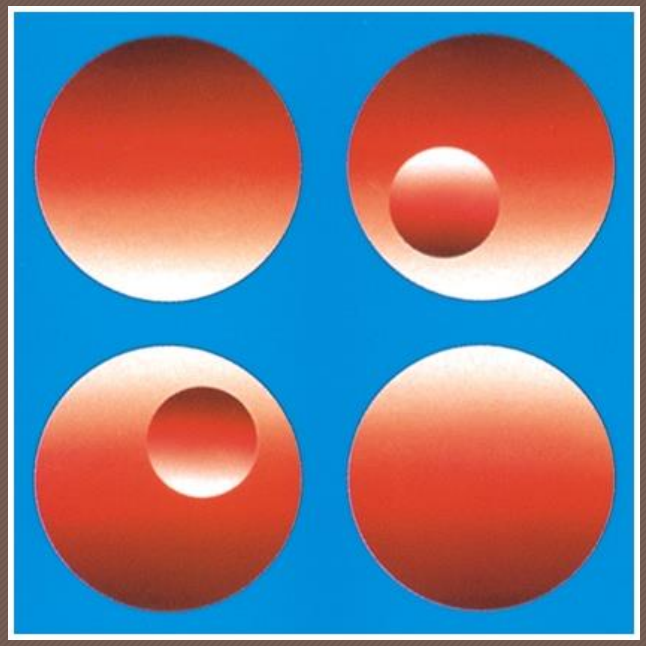
The more the lines converge, the greater their perceived distance.



Monocular Cues

Light and Shadow: Nearby objects reflect more light into our eyes than more distant objects. Given two identical objects, the dimmer one appears to be farther away.



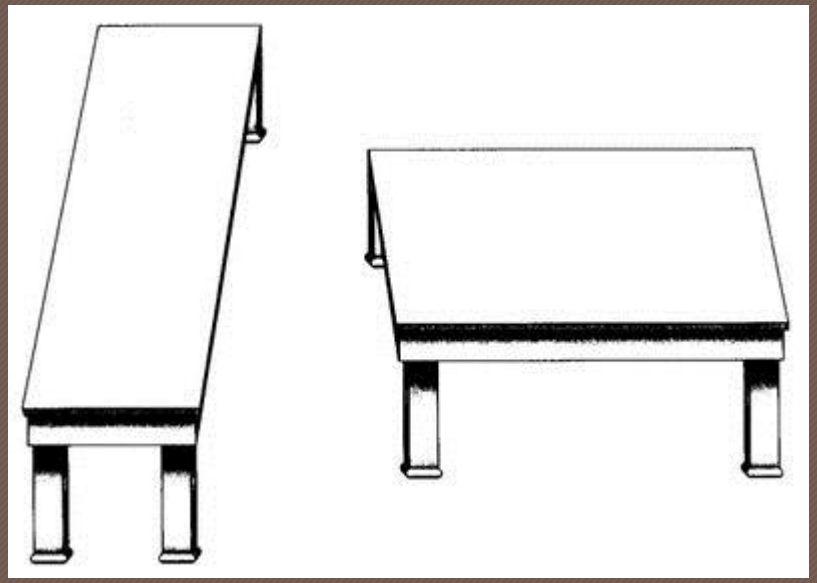


Perceptual Constancy

19-3

Perceptual Constancy

Regardless of our viewing angle, distance, and illumination, the top-down processing ability called perceptual constancy allows us to identify people and objects in less time than it takes to draw a breath.



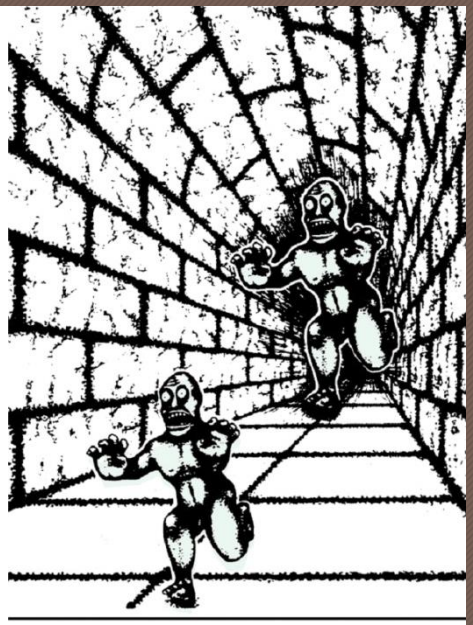
Sometimes an object whose actual shape cannot change seems to change shape with the angle of our view.

Color Constancy

19-3

Perceiving familiar objects as having consistent color even when changing illumination filters the light reflected by the object.

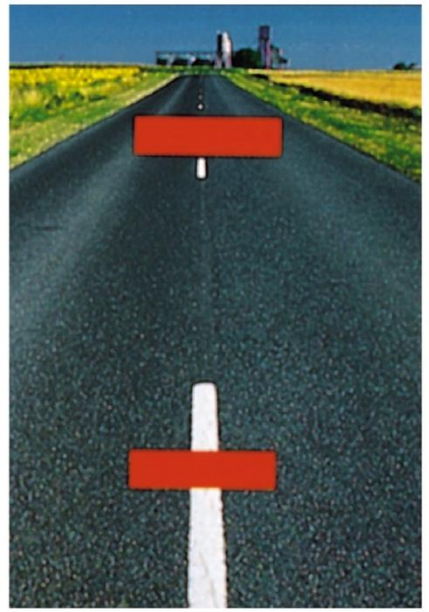
Size-Distance Relationship



(a)

Experience tells us that a more distant object can create the same size image as a nearer one only if it is actually larger.

As a result, we perceive the more distant monster and red bar as larger.



(b)

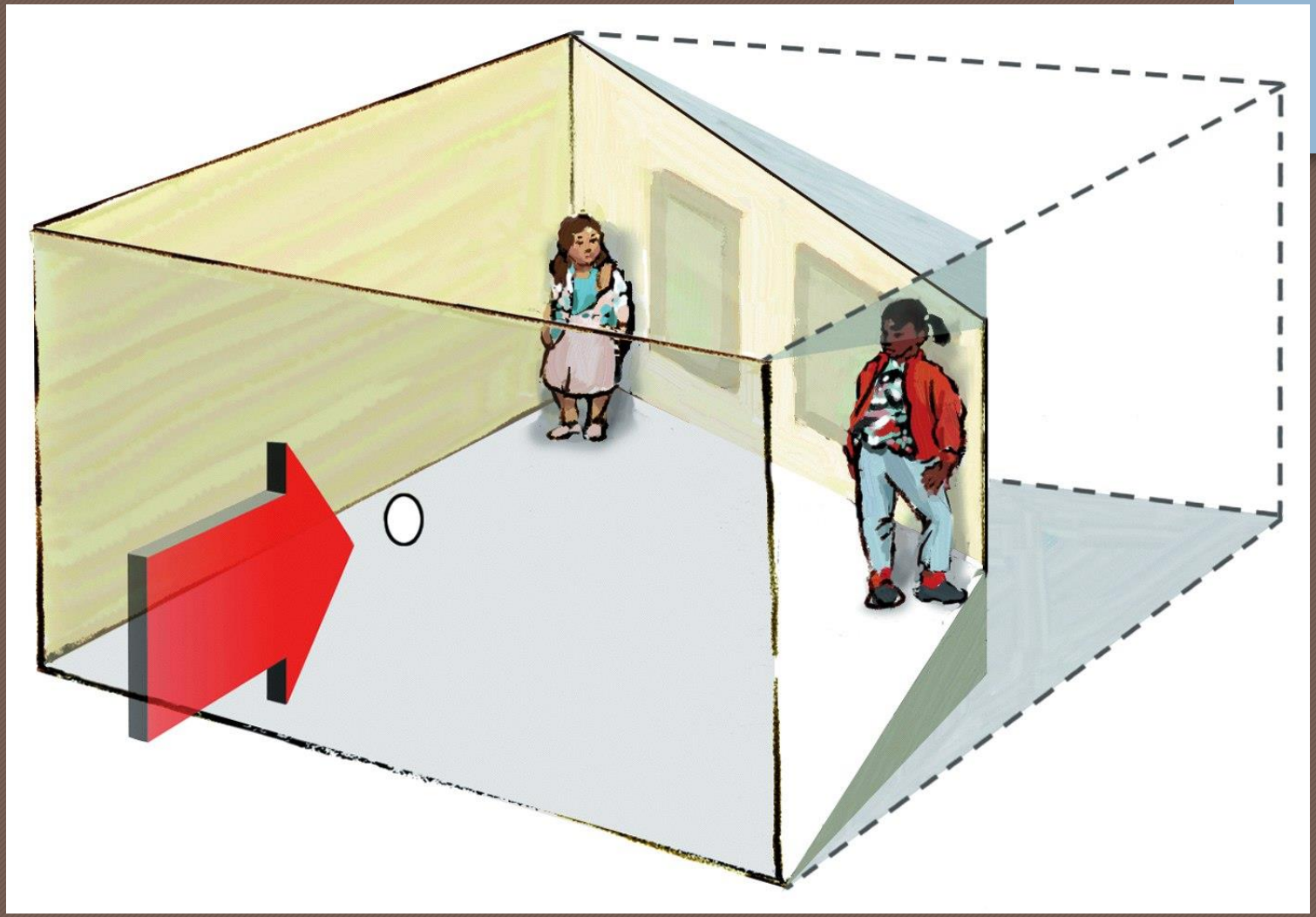
Size-Distance Relationship

Both girls in the room are of similar height.

However, we perceive them to be of different heights as they stand in the two corners of the room.

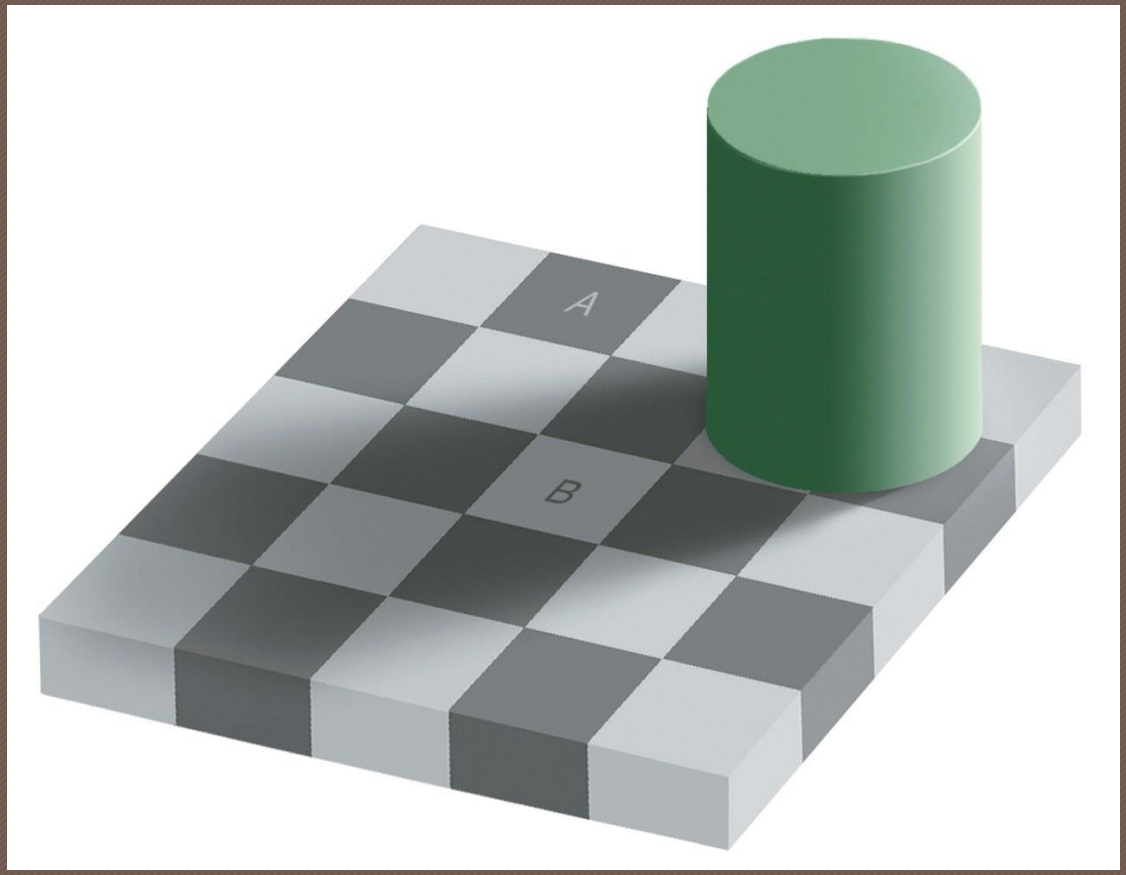
Ames Room

Ames Room

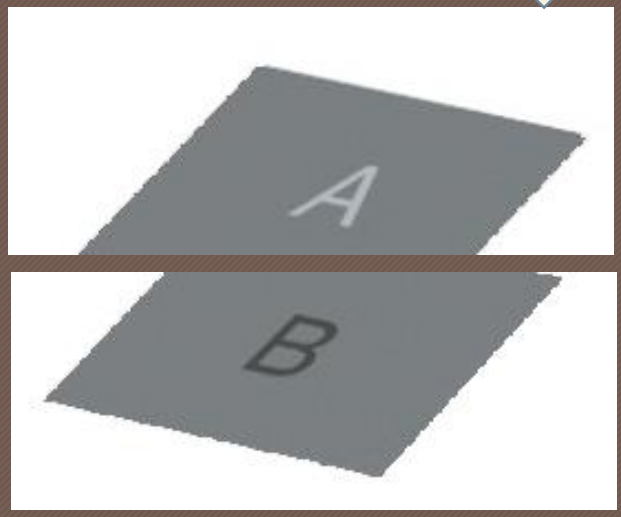


The Ames room is designed to demonstrate the size-distance illusion.

Brightness Constancy



The color and brightness of square A and B are the same.



Visual Perception

19-4

Perceptual Adaptation

19-4

Perceptual adaptation - the visual ability to adjust to an artificially displaced or inverted visual field

Experiments involving inversion glasses reveal that after about a week people can adapt to the change, and even ride a motorcycle, ski, and fly an airplane