Complex perceptual development

IIE 366: Developmental Psychology

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Lecture 12

Chapter 5: Perceptual and Motor Development

Module 5.2 Complex Perceptual Processes

Children and Their Development, 4/e by Robert Kail

5.1 Integrating Sensory Information

- Infants can recognize visually an object that they have only touched previously
- Infants can detect relations between visual and auditory information
- Infants' sensory systems are attuned to intersensory redundancy: They learn best when information is presented simultaneously to more than one sensory system.

5.2 Complex Perceptual and Attentional Processes

Perceiving Objects

Faces

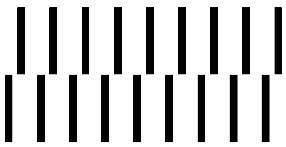
Modal / Amodal perception

- There are at least two different "types" of visual perception
- Modal perception: visual awareness of a surface
  - Color
  - Brightness
  - Usually referred to as "seeing"
- Amodal perception: visual awareness of an arrangement of visual information
  - Without a direct experience of color or brightness
  - Sometimes confused with "seeing"
  - More aptly called "knowing" without "seeing"

Kanizsa, 1979

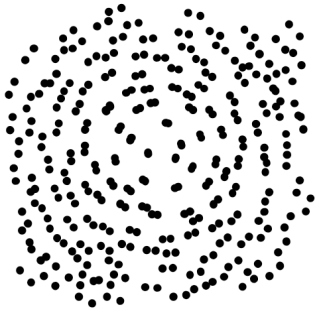
Perception

- In this image you have a *modal* percept of the vertical lines
  - Black color
- You also have an *amodal* percept of a horizontal contour
  - It has no color



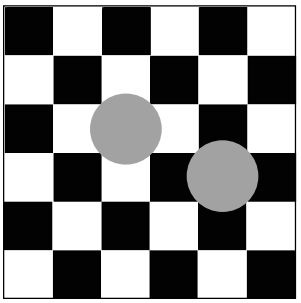
Perception

- In this image you have a *modal* percept of the black dots
- You also have an *amodal* percept of the dots being organized in a circular arrangement
  - It has no color
  - You do not *see* the big circles, but you *know* of them



Amodal percepts

- Is amodal perception just *inference*?
- NO!
- Statistical inference implies the occluded checks should be different from their neighbors
- But it "looks" (amodally) to be the same color



Kanizsa, 1979

Amodal percepts

- Amodal percepts often come about from occlusion
- But occlusion is not always bad for detection
- It is difficult to identify these elements

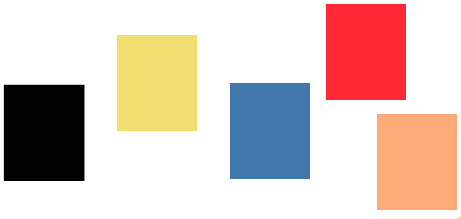
Bregman, 1981

Amodal percepts

- Identification is *easier* with an occluding ink blot
- The occluder allows for amodal percepts to be constructed
- Which aid recognition in this case by connecting disparate elements of the fractured letters

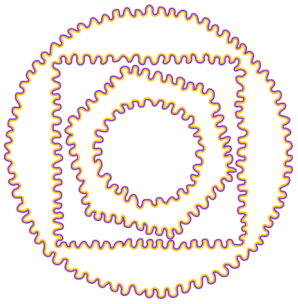
Seeing

- Seeing is knowledge about *surface* properties
  - Brightness
  - Color



Seeing surfaces

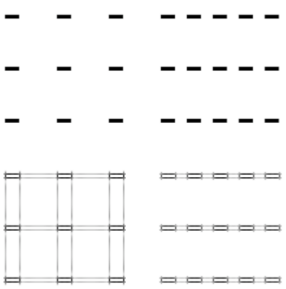
- Color spreads across a defined surface



Pinna et al., 2001

Amodal perception

- Gestalt grouping principles
- Elements are connected without connection being "seen"



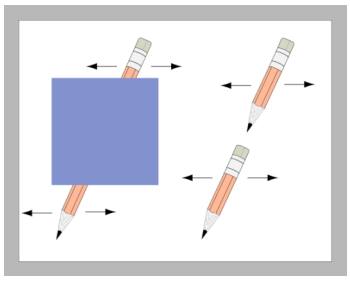
Horizontal and vertical are roughly balanced

Horizontal wins

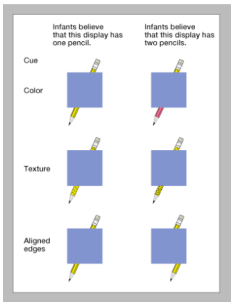
5.2 Perceiving Objects

- Motion, color, texture, and aligned edges are used to perceive objects

Use of Motion to Perceive Objects



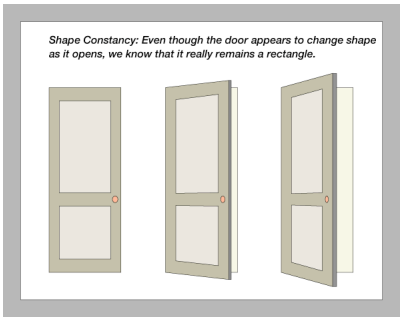
Perceiving Objects Using Color, Texture, and Aligned Edges



5.2 Perceiving Objects

- Motion, color, texture, and aligned edges are used to perceive objects
- Infants master perceptual constancies early: By 4 months, infants have size, shape, brightness, and color constancy

Shape Constancy



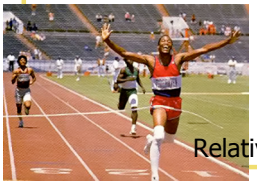
5.2 Perceiving Objects

- Motion, color, texture, and aligned edges are used to perceive objects
- Infants master perceptual constancies early: By 4 months, infants have size, shape, brightness, and color constancy
- Many cues are used to infer depth

Perceiving depth: the visual cliff paradigm

Cues that infants used to judge depth

Interposition

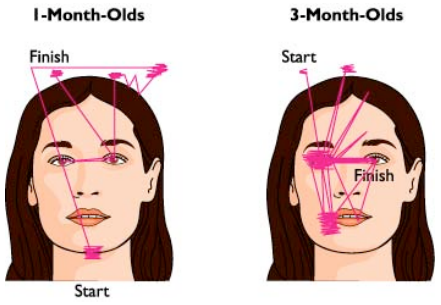


Relative size

5.2 Perceiving Objects

- Motion, color, texture, and aligned edges are used to perceive objects
- Infants master perceptual constancies early: By 4 months, infants have size, shape, brightness, and color constancy
- Many cues are used to infer depth
- Infants like to look at human faces

Infants' Scanning of Faces



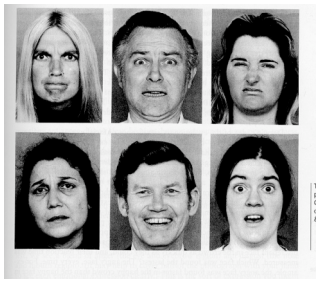
5.2: Perceiving Objects

Universal facial expressions

- There is evidence that humans have some universal facial expressions
- Happiness
- Surprise
- Sadness
- Anger
- Disgust
- Fear

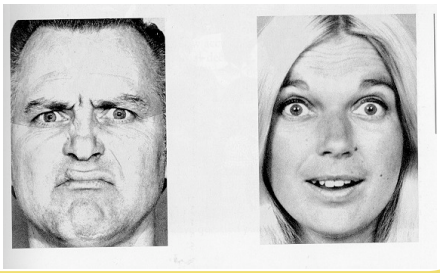
Universal facial expressions

- There is evidence that humans have some universal facial expressions
- Everyone judges these expressions in nearly the same way
- Across people
- Across cultures



Universal facial expressions

- Moreover, blended facial expressions do not look like much of anything



Infant facial expressions

- Infants exhibit many of the universal expressions

Infant directed expressions

- Mothers use particular faces when addressing infants
- They can be described by their muscle combinations

Oochie expression

- Lip pucker, lip pull, lips part/jaw drop
- Unlike any adult emotion (fish mouth face)
- Emotion judged as:
  - » Undergraduates: Comfort & caring, Interest & attention
  - » Mothers: Comfort & caring

Joy expression

- Inner/outer eyebrow raise, lip corner pull, mouth stretch
- Similar to adult expression of happy
- Emotion judged as:
  - » Undergraduates: Happiness, Love & warmth
  - » Mothers: Happiness, praise & admiration

Wow expression

- Cheek raise, lip corner pull, lips part/jaw drop
- Similar to an adult expression of surprise (mock surprise)
- Emotion judged as:
  - » Undergraduates: Surprise
  - » Mothers: Interest & attention, excitement & enjoyment, surprise

Facial expressions

- These faces were made by both English speaking mothers and Chinese-speaking mothers
- Presumably, there would not be this common pattern of faces unless infants (4-7 months) could detect them and discriminate between them
  - » Often the faces go with words that convey comfort, surprise, praise

Next time

- Attentional development
- Motor development