

UNIVERSITY OF QUEENSLAND
SCHOOL OF PSYCHOLOGY

Slide 1

**PSYC 1020
Sensing and Perceiving II**

Topics:

Colour
Size, Distance & Shape
Figure-Ground Perception (Gestalt Psychology).

*Westen et al. Ch 5 pp. 119-76

**Bond/McConkey Prt 3 pp. 1-39

Slide 2

**Colour Vision
Trichromacy**

H. von Helmholtz (19th century)
Thomas Young (19th century)
Visual Representation (Artists/Painters)
Red (long), Green (medium), Blue (short)

Westen et al. Ch 5 pp. 138-40

Bond/McConkey Prt 3 pp. 13-17

Slide 3

Colour Vision

Trichromacy & Colour Mixture
Primary Colours
Hue
Saturation
Brightness

Westen et al. Ch 5 pp. 138-140

Bond/McConkey Prt 3 pp. 13-17

Slide 4

**Chromatic Adaptation
Negative Colour Afterimages**

Induction Figure : Flag - green/black/yellow
Complementary Colours
Test Figure Blank, light grey field
Observe negative (complementary afterimage)

Westen et al. Ch 5 p. 129 + pp. 138-40

Bond/McConkey Prt 3 pp. 16-17

Slide 5

Colour Vision

Opponent processing
E. Hering (19th century) addressed:

The problem of perceiving yellow
The related problems of “negative afterimages”
and complementary colours.

Westen et al. Ch 5 pp. 140

Bond/McConkey Prt 3 pp. 15-16

Slide 6

**Colour Vision
Three Opponent-Colour Channels**

Chromatic: Red vs Green
Blue vs Yellow

Achromatic: Black vs White.

Westen et al. Ch 5 pp. 139-40

Bond/McConkey Prt 3 pp. 15-16

Slide 7

**Colour Vision Deficiencies
Protan-, Deutan-, Tritan-**

Abnormal Matches & Poor Discrimination:
Protanomaly (Red) Deuteranomaly (Green)

Red-Green Confusions (missing pigments):
Protanopia (Red); Deuteranopia (Green)

Blue/Green Confusions:
Tritanopia (Abnormal Red Pigment)

See Slide 20 for Population %

Westen et al. Ch 5 p. 140, Figure 4.14

Slide 8

Why Do Things Look Like They Do?

Because they are what they are
Because we are what we are
Distinguishing “Sensation” & “Perception”
Kurt Koffka 1935
“Principles of Gestalt Psychology”

Westen et al. Ch 5 pp. 155-56

Bond/McConkey Prt 3 pp. 73-77

Slide 9

Size & Distance Perception

The Proximal Stimulus (retinal images of objects)
The Distal Stimulus (external objects)
[What happens to size of retinal image as object changes distance? What happens to perceived size of object?]

Basic definitions

Bond/McConkey Prt 3 p. 65 -71

Slide 10

Size Constancy

Size-distance relationships
Monocular (Pictorial) Distance Cues

Texture & Linear Perspective
Occlusion (one object partially obscures another)
Relative Size

Westen et al. Ch 5 pp. 162-163

Bond/McConkey Prt 3 pp. 65-71

*Weston, D., Burton, L. & Kowalski, R. (2006). Psychology: Australian and New Zealand Edition. Milton: John Wiley & Sons Australia Ltd.

**Broerse, J. *Sensory Systems*. (2001) In N. Bond & K. McConkey (eds), *Psychological Science*. McGraw Hill: Sydney.

Slide 11

Size-Distance Illusions

The Ponzo Illusion

Applying size-distance relationships to sense data, inappropriately (misapplied constancy scaling).

Underlies the old idea (e.g., Helmholtz) that perception involves unconscious inferences from sense data

Westen et al. Ch 5 pp. 163-64

Bond/McConkey Prt 3 pp. 68-69

Slide 12

Binocular depth & Distance

Retinal (or binocular) Disparity

Left Eye

Right Eye

OBJECT

Compare the views of an object from the vantage point of each eye.

Westen et al. Ch 5 pp. 158-60

Bond/McConkey Prt 3 p. 67

Slide 13

Shape Constancy

A special case of size constancy

Consider the 2-dimensional shapes of an image of an object as the object rotates in the fronto-parallel plane. Question: The shape of the image changes, what happens to the perceived shape of the object. [Broerse, J. Ashton, R., Shaw, C. 1992, *Perception*, 21, 261-68]

Westen et al. Ch 5 p. 162.

Apply Bond/McConkey Prt 3 pp. 70-71

Slide 14

Shape Constancy & Motion

Object Rigidity

Consider rigidity as dynamic shape constancy: If a rotating object can be perceived as rigid, it will be.

[Broerse, J. Li, R. Ashton, R. 1994, *Perception*, 1049-62]

Westen et al. Ch NA.

Bond/McConkey Prt 3 p. 57

Slide 15

Figure-Ground Segregation

The Gestalt Alternative

In conventional theories of perception, "objects" are constructed ("unconscious inference") from sensory data (e.g., size, distance, shape, colour). In the Gestalt alternative, objects (figures) are primary (the whole is more than just the sum of the parts).

Westen et al. Ch 5 pp. 155-56

Bond/McConkey Prt 3 pp. 73-77

Slide 16

Find The Hidden Figure

At first glance, some displays give the impression of random and meaningless collections of blobs. Upon longer inspection, meaningful organisation appears to "pop-out". And once seen, it is difficult not to see the figure. (compare the idea of camouflage).

Westen et al. Ch 5 pp. 155-56

Bond/McConkey Prt 3 p. 76

Slide 17

Figure-Ground Segregation

Perceptual Grouping & Pop-out

Gestalt Laws of:

Closure, Proximity, Similarity,

Good Figure (Prägnaz)

Visual search and pop-out

Westen et al. Ch 5 pp. 155-156

Bond/McConkey Prt 3 pp. 74-77

Appendix: Slide 18.

Colour Vision Deficiencies

Population Frequencies

Protanomaly (M 1.0%; F 0.02%)

Deuteranomaly (M 4.9%; F 0.4%)

Protanopia (M 1.0%; F 0.02%)

Deuteranopia (M 1.1%; F 0.01%)

Tritanopia (very rare)

Definitions

*Weston, D., Burton, L. & Kowalski, R. (2006). *Psychology: Australian and New Zealand Edition*. Milton: John Wiley & Sons Australia Ltd.

**Broerse, J. *Sensory Systems*. (2001) In N. Bond & K. McConkey (eds), *Psychological Science*. McGraw Hill: Sydney.

UNIVERSITY OF QUEENSLAND
SCHOOL OF PSYCHOLOGY

*Weston, D., Burton, L. & Kowalski, R. (2006). Psychology: Australian and New Zealand Edition. Milton: John Wiley & Sons Australia Ltd.

**Broerse, J. *Sensory Systems*. (2001) In N. Bond & K. McConkey (eds), *Psychological Science*. McGraw Hill: Sydney.