Chapter 6 Perceiving the World

"Seeing" by R.L. Gregory
Gestalt- reference, says that an "object could not be reduced to its separate elements alone, it's over all configuration is what mattered most- "the whole is greater than the parts."
Relationships are important
All perception requires figure and ground
The eye actively selects and filters what is perceived

Eye transforms visual energy into coded – neural impulses that reflect patterns of brain activity- that represents objects.

There is a tendency to group things into units.
There is a tendency to organize into patterns

We see using more than just visual stimulation
We use previous experience
We use knowledge and expectation

Underlying processes:
2 kinds of ambiguous figures
1. Object = figure or
   Ground
2. Spontaneous depth change
   Necker cube- shows perception is not just stimulus patterns
   It is dynamic searching for the best interpretation of the available data

   The data is sensory info that and knowledge helps us understand and perceive characteristics of objects.

Perception goes beyond the immediate evidence of the senses.
Senses provide evidence for checking hypotheses about info
The perceived object is a hypothesis

Image = hypothesis
Necker Cube for example, we have 2 hypotheses and no perceptual clues to help identify correct hypothesis.

(Perception is an active process)
What is the role of Experience in Perception?
What is the role of Culture in perception?

Perceptual Constancies (need experience)
Must be familiar with objects to use their size to judge distance

Size Constancy =
Perceived size of object remains the same even though size on retina changes

Perception is empirical= experiential

Shape Constancy
Shape of an object remains constant
(Alcohol impairs)

Brightness Constancy (by associational)
Brightness of objects appears same
If surrounding objects are illuminated

Perceptual Organization

Perception (defined)
Making sense of visual stiumuli

Organization of Perception:
Contrasts are perceived easily
Similar to sensory analysis “Pop out”

Figure Ground Organization:
Figure ground perception first

Reversible-Figure Ground
Perception is reversed
Background is more visible

Gestalt Principles
‘The whole is greater than its parts’
We have tendency to complete shapes
To see patterns
To make sense of the whole verses just the small pieces.

Factors of Perception: (factors that bring order to perceptions)

Nearness:
- Items near are grouped together
- Seen in groups or outsiders

Similarity:
- "They look alike"
- Perceived size/shape, color, form
- Tend to be grouped together

Continuation or Continuity:
- Simplicity or continuity is easier to perceive
- It's easier to visualize wavy lines than complex rows

Closures:
- Tendency to complete figures so that they have an overall form
- Illusory figures implied complete shapes

Contiguity:
- Nearness in time and space
- Relates to perception of cause and effect

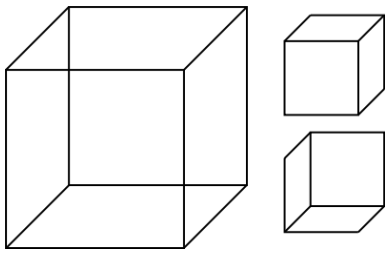
Common Region
- Stimuli found in a common region or area
- Have tendency to be seen as a group
- Used in everyday patterns
    - Camouflage- breaks up figure ground images/contrasts

How do we design things to be perceptually efficient?

We create **Perceptual Hypotheses**

We tend to expect and find meaning in organized visual perceptions
From a distance we create hypotheses and as we get closer we prove or disprove the hypothesis

Problem- we expect and understand based on experience (preexisting ideas)



Ambiguous Stimuli: (Spontaneous Depth Change)

Patterns that allow more than one interpretation = Necker's Cube
Necker's Cube

Spontaneous Depth Change
Show's perception is not just stimulus patterns
It is dynamic searching for the best interpretation of the available data
The brain interprets two orientations of the cube…

Idea is we are not passive but actively construct meaningful perceptions

Problem- we have conflicting information and this prevents a stable perception.
Lines are easily perceived

Depth Perception:

The ability to perceive 3 dimensional space
Without – the world would be flat

Depth Perception is both

Nativist= inborn
Empiricists = Experienced based

Visual Cliff

Concept that tests depth perception in babies

Depth Cues:

Are features of the environment and messages from the body that supply info- about distance

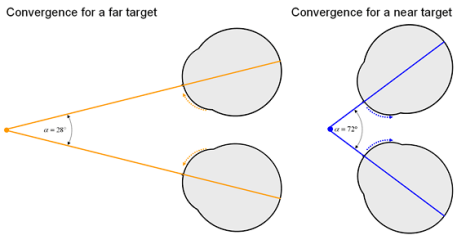
Cues can be monocular or binocular

Muscular Cues-

Accommodation= bending of lens to focus on nearby objects = changes focal point distance on retina

Mono or Bino cues

"Sensations from muscles attached to each lens flow back to the brain."



Convergence- (binocular cue)

Distant vision = parallel with in eyes
50' eye convergence
Controlled by muscles attached to eyeball
Feed info to the brain helps judge distance

Stereoscopic Vision:

The focusing of images by two eyes

3 dimensional sight

Retinal Disparity (Binocular Cue)

Two eyes

See world slightly differently

"Discrepancy in images that reach the right and left eye"

Produces depth

3-D movies 

Two cameras filming

Separated by inches

Glasses filter out one image to each eye (stereoscopic vision duplicated)

Random Dot Stereogram-

Patterns of dots that produce an illusion of depth

Shows the brain is very sensitive to any mismatch

One eyed Vision:

Is limited in depth

We can learn depth through

Bird's Eye View:

Wide field of view

Limited binocular views = depth

Pictoral Cues for Depth:

Linear Perspective: (Railroad Tracks)
- Appear to converge
- Convergence- implies great distance

Relative Size:
- Distant objects look smaller

Height in picture plane:
- Objects placed higher in a drawing are perceived in distance

Light and Shadow:
- Patterns can appear 3D (Escher)

Texture Gradients:
- Contribute to perception

Overlap:
- Interposition
- One object partially blocks another

Areal Perspective:
- Distant objects appear hazy and washed out color

Relative Motion:
- Objects appear motion = motion parallax

Moon Illusion:

We constantly use:
- Pictoral cues
- Bodily cues

Perceiving the moon as larger when low in the sky
- Reality- moon is closer when directly over head
- We perceive the moon as closer to the earth because of depth clues
- Moon appears larger on the horizon because of the depth cues

We are engaging in the Apparent Distance Hypothesis
- Existence of depth cues causes us to make distance objects seem closer

Perceptual Learning:

Refers to changes in the brain that alter how we process sensory information

We learn to focus on one part of stimuli

We learn to tell the difference between stimuli

Perceptual Habits:

Experience

Ingrained patterns of organization and attention

We build habits of perception

Magazines rely on perceptual habits

Other Race Effect:

Facial recognition

People are much better at recognizing faces of their own race

Because of experience

Inverted Vision:

Goggles turned world upside down

Reversed objects from left to right

People adapted

The world seemed normal because of experience and active movement

People need to be active to adapt

Adaptation Level:

External context = info surrounding stimulus

Factor affecting perception

Frame of Reference:

Internal standards for judging stimuli

Illusions:

Result from constantly misjudging

Length
Motion
Position
Curvature
Direction

Stroboscopic Movement

Illusion showing motion
When objects are shown in rapidly changing positions
Strobe light reverses this by freezing movement visually

Size Distance Variance:

The size of an object is precisely related to its distance from the eyes
2 objects make image the same size
The more distant object must be larger.

Ames Room 

Appears square from one specific perspective
Distorts proportions

Perceptual Features:

Brain is sensitive and naturally finds lines, shapes, edges, spots and colors
Features are also learned

Motives and Perception:

We are surrounded by stimuli

Selective Attention

We give some messages priority <bottleneck/narrowing of info>

Divided Attention

Dividing mental effort among tasks

Each requires more or less attention

Intense Stimuli <Advertising>

Commands attention

Brighter

Louder

Larger

Repetitious Stimuli

Grabs attention

Contrast or change in stimulation gets attention

Attention and Perception:

Definition- "the process of directing and focusing certain psychological resources to enhance perception, performance, and mental experience"

We use attention to direct our sensory and perceptual systems toward certain stimuli,

to select specific information for further processing

to ignore or screen out unwanted stimuli

to allocate the mental energy to process selected

to regulate the flow of resources

Perception cannot occur without attention

3 important characteristics of attention

Improves mental processing- concentration is important

Attention takes effort- difficult to pay attention when tired

Attention resources are limited-

Control Over Attention:

Can be voluntary or involuntary

Voluntary= goal directed, in order to perform a task

Top Down processing

Attention is guided by intentions, beliefs… knowledge based factors

Involuntary= loud noise diverts attention

Attentional control is Bottom Up = Stimulus Driven

Inattentional Blindness Click first
The occurrence where when focused on a specific item we miss other information and items
"Failure to detect or identify normally noticeable stimuli

Habituation
Boredom
Responds less to unchanging stimuli
To not be stimulated
Connected to adaptation-
Decreases the actual number of sensory messages sent to brain

Orientation Response (biological)
Prepare us to receive info from stimulus
Pupils enlarge
Brain patterns shift
Breathing stops
Blood flow to head increases
Turn toward stimulus
"Double Take"

Motives have role in attention
Motive for one stimulus will make perception of that stimulus more sensitive

Perceptual Expectancies:
Expecting stimuli in a certain manner
"Past experience motives, context"
Prepares you to perceive in a certain way
"We see what we expect to see"
Are also created by suggestion

Bottom Up Processing
A puzzle in pieces
Feature Analysis (Form, Color, Motion, lines, shapes, colors)
Analysis of info with sensory units
Build upwards to a complete picture

Top Down
A complete picture (a known puzzle)
Preexisting knowledge used to organize feature s to a whole Gestalt
Influenced by expectancy and motivation
Schemas- based on past experience can create a **perceptual set** (**Perceptual Set** = the readiness to perceive stimuli in certain ways.)

Bottom Up = Stimulus Driven

Relying on specific details information from sensory receptors that are assembled into a whole.

Stimulus characteristics:

Sudden Changes in light or color,

Movement

Appearance of Unusual shapes

(dominik Polese

Knowldege and beliefs create expectations- that give meaning to the features. Interpretations that are suggested can be recognized

Perceptual Categories

Classes, types, groups, experiences are sorted into categories

Labels impact the way people perceive others

Perceptual Awareness:

Maslow & Perception

Some people perceive themselves and other with great accuracy

These people are especially alive

Characteristic-

Lack of self consciousness

Not critical

Not evaluating

Examples:

Mother and infant

Children @ Christmas

Two people in love

Dishabituation

Reversal of habituation

You are paying more attention

Interested