Attention Perception and Performance

Introduction to the Human Sciences
Lecture 4
12 April 2019

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Today's Topic

Introduction

How we do study mental processes

Perception

Personality and **Social Psychology**

Recap

- Things to be taken care of when we perform experiment
- How do we perceive reality
- What is Perception?
  - Sensation to Perception
  - Binding Problem, Illusory Conjunction and its relation with attention and perception
  - Role of attention in perception

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Activity 1

- Can we perceive invisible stimuli?
  Subliminal Processing
- Can we "read" someone else's thoughts?
  Extra-Sensory Perception
- Can certain blind people still "see" some of their surroundings?
  Partial *vs.* Complete Visual Impairment
- Do some people "taste" shapes or "hear" colours?
  Synaesthesia

Reality

Virtual Reality

Experience through our senses !
How this conscious experience is different?

Things that we do not / can't sense are not real?
eg. visual impairment, Agnosia

Things that we do sense in absence of real stimulus, is reality?
Like hallucination?

Is its umwelt ?

What is PERCEPTION ?

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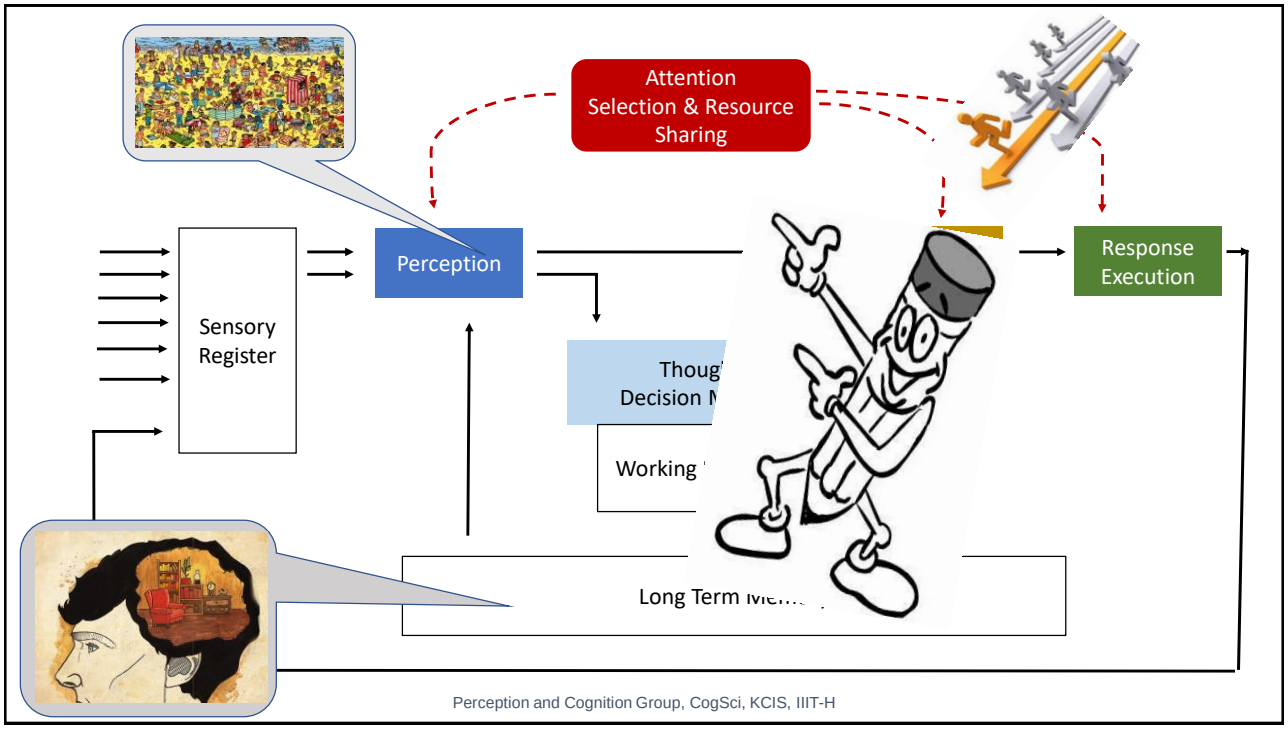
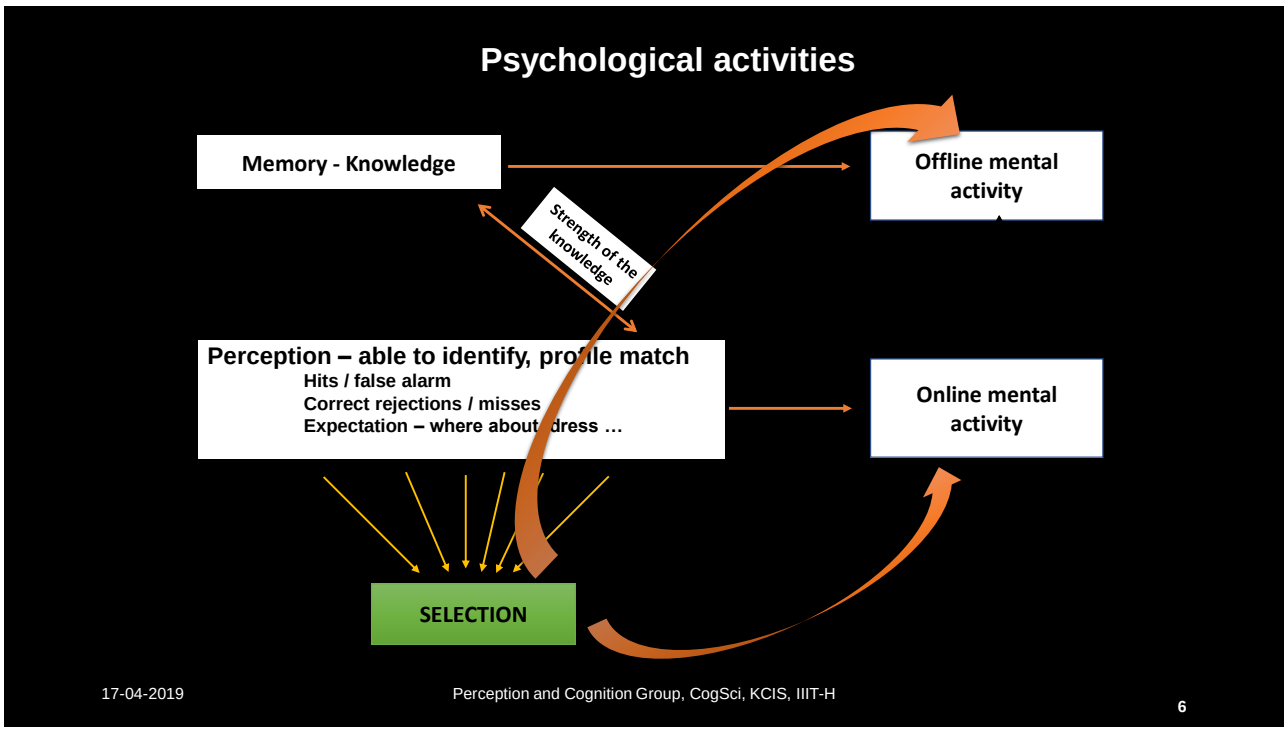

Attention
Selection & Resource
Sharing
Perception
Sensory
Register
Response
Execution
Working
Long Term
Perception and Cognition Group, CogSci, KCIS, IIIT-H


Psychological activities
Memory - Knowledge
Offline mental
activity
Strength of the
knowledge
Perception – able to identify, profile match
Hits / false alarm
Correct rejections / misses
Expectation – where about dress …
Online mental
activity
SELECTION
17-04-2019
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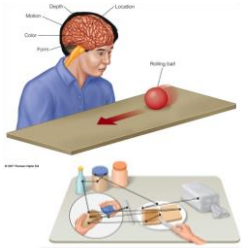
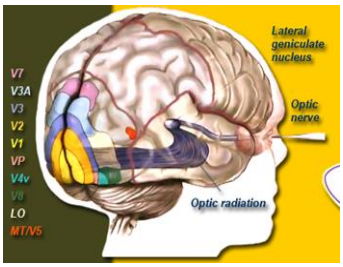
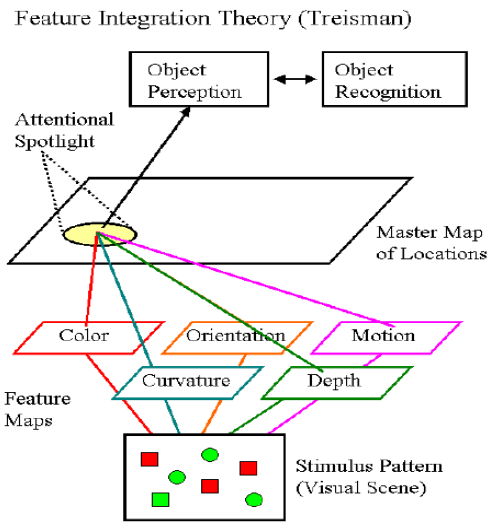
Attention and Perception

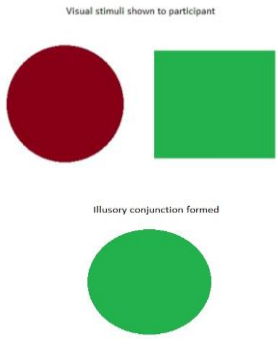


The BINDING PROBLEM





Attention work as a GLUE



Illusory Conjunction

Do we always need Attention?

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- **Inattention Blindness – Failure to perceive the object that are not the focus of attention**

- **Change Blindness – failure to detect changes to the visual details of a scene**

- **Subliminal Perception – Thought or behaviour that is influenced by a stimuli that a person cannot consciously report perceiving**

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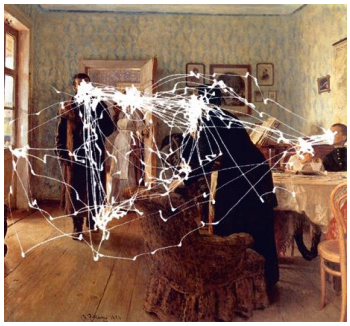
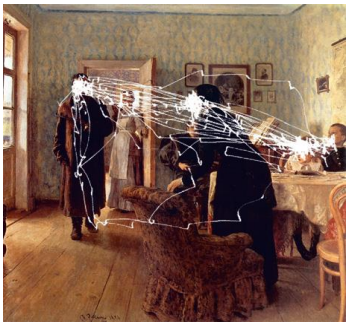
Ilya Repin, *An Unexpected Visitor*, (1884)

Yarbus, 1967



Free Examination

Clothes they are wearing



Ages of the People

Activity prior to the visitor

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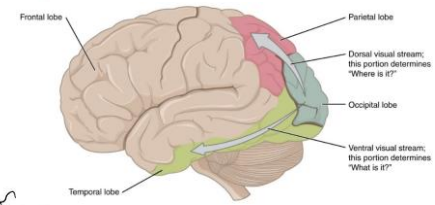
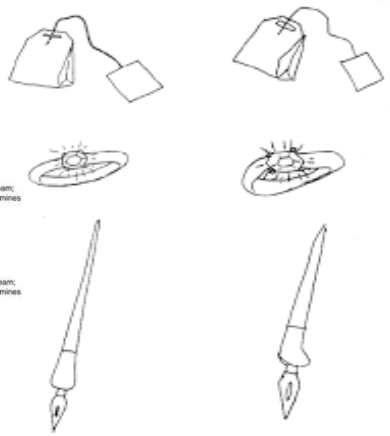
Visual Agnosia





Apperceptive

(Benson & Greenberg, 1969)

Associative

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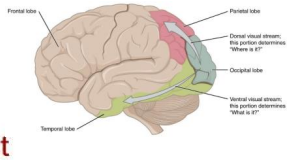
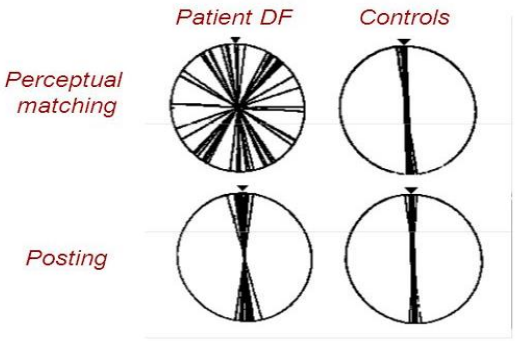
Visual Agnosia – large occipital cortex and a region in ventral stream



- DF has ventral damage
  - Profound agnosia :: can not even tell orientation of object
  - Motor control accurate :: motor system functions accurately.



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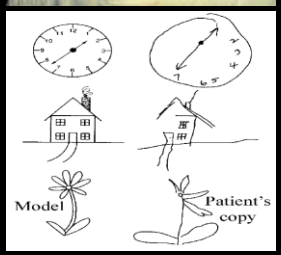
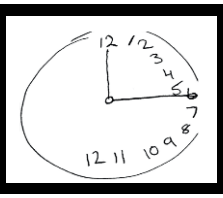
Visual Neglect





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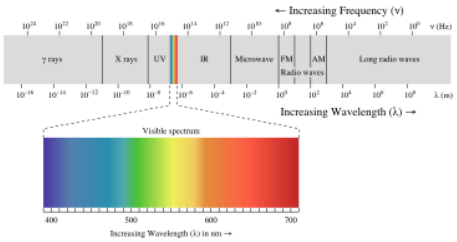
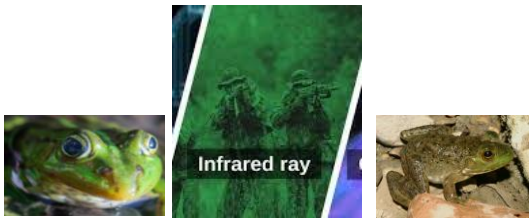
What about Colours?

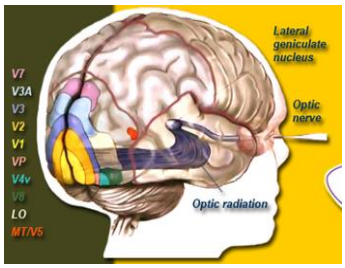
human vision (R+G+B), UV vision (bright = UV), tetrachromatcic: UV+R+G+B



Where the Sense of COLOR comes from?



https://www.youtube.com/watch?v=9CpEV9_JOv8



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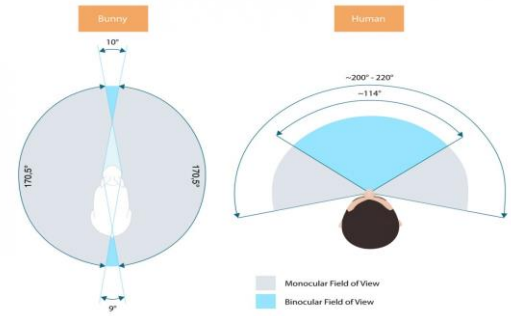
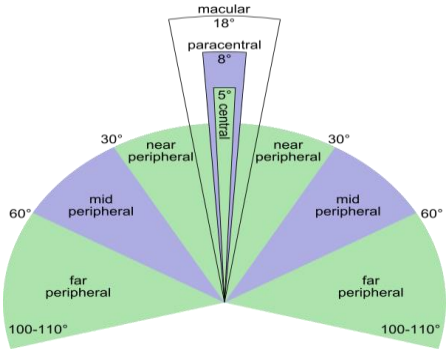
Mary's room Problem





Upright to Upside down Reality !

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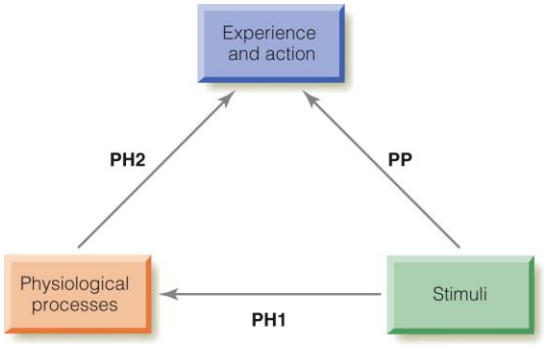
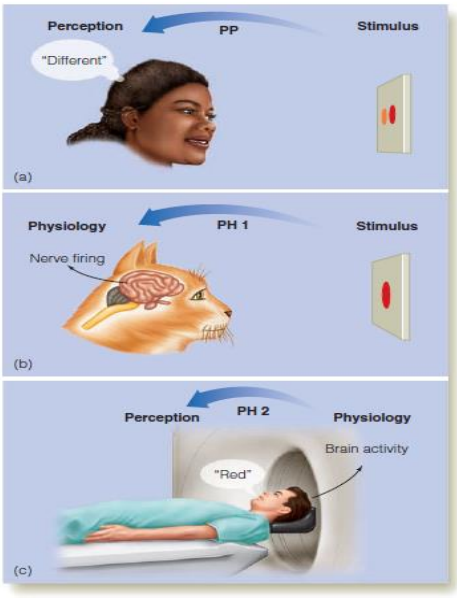
How **Reality differs in absence / regain of modality ? – Mike May Story**

How do we study Perceptual Processes?

•**Self report**, looking at introspection method (Wilhelm Wundt and Edward Titchener) but then it is not reliable

• **Objective-subjective measure** of observers' sensitivity to a given stimulus with respect to its varying strength – Psychophysics (Gustav Fechner , mid 1800)





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Measuring Perception

- **Recognition** – categorizing, naming
- **Detection** - methods of limits / adjustment etc.
- **Perceiving Magnitude** – awareness of size/ intensity
- **Searching** - looking for target amidst other irrelevant stimuli

Difference threshold: the smallest difference between two stimuli that can be detected half the time, a/k **just noticeable difference – Weber's Law**

- The stronger the initial stimulus is , the larger the difference is required to be noticed

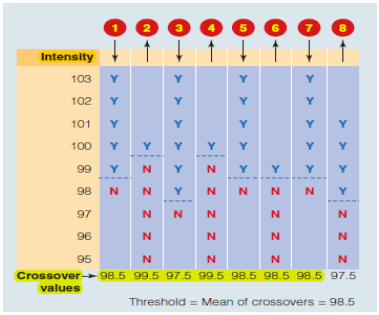
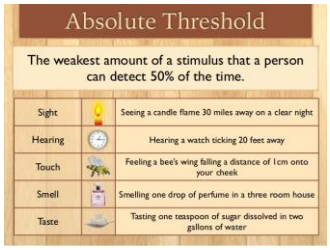
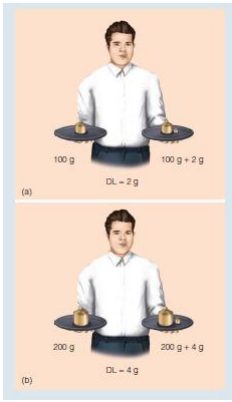


Figure 1.12 The results of an experiment to determine the threshold using the method of limits. The dashed lines indicate the crossover point for each sequence of stimuli. The threshold—the average of the crossover values—is 98.5 in this experiment.



Methods of Limits (Absolute threshold)



Difference Threshold

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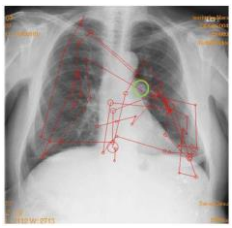
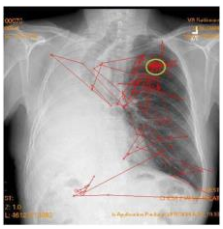
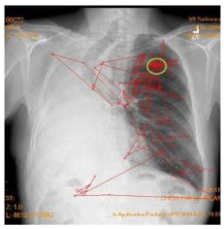
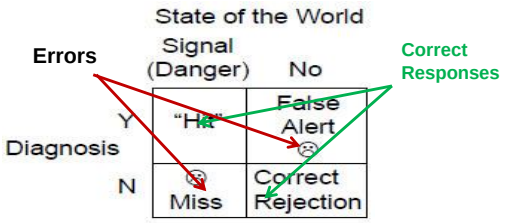
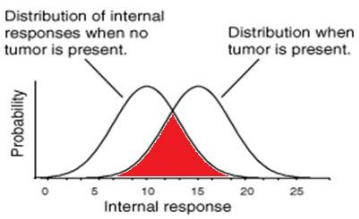
Signal Detection Theory – Perceptual Sensitivity

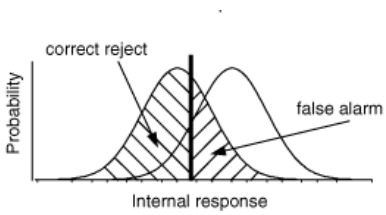


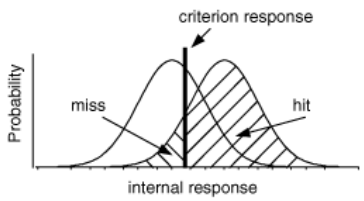












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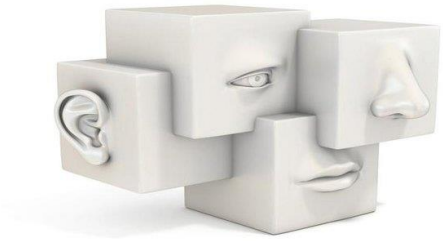
Sensory Branding



1946-1966 1966-1996 1996-2008 2008-now

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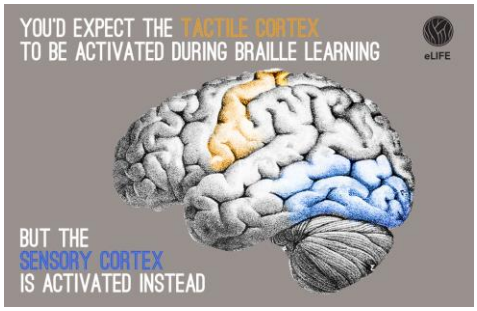
Sensory Cross Talk: Sensory system stick to one sense – or Do they?



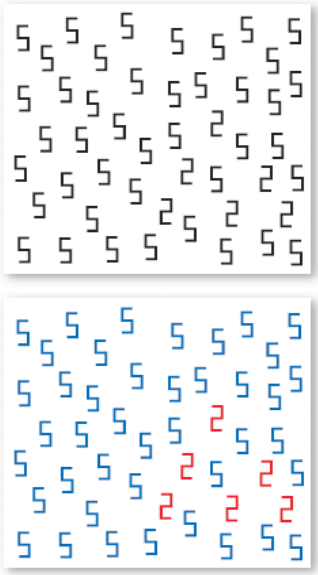
Visually impaired visual cortex

https://www.youtube.com/watch?v=G-IN8vWm3m0

McGurk Effect

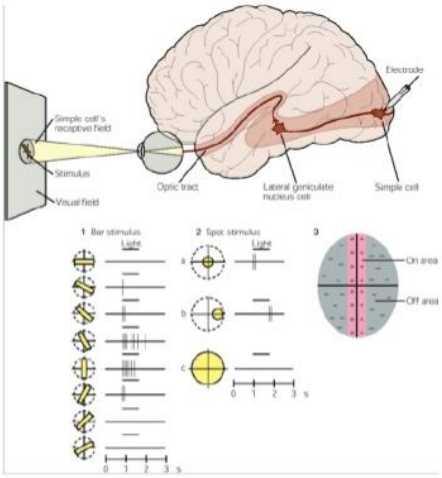
https://www.youtube.com/watch?v=sxwn1w7MJvk

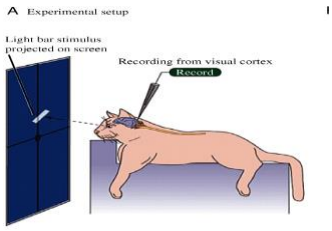
Rubber hand Illusion



Synaesthesia: grapheme-color syn.

Simple Cells

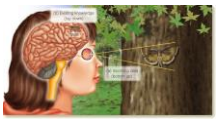




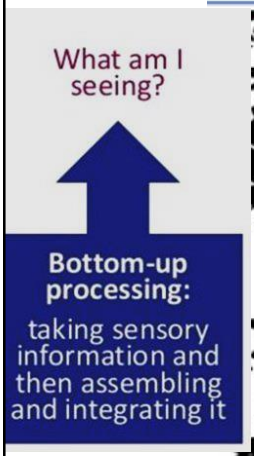
Hubel & Wiesel, 1959, 1962, 1965,1968

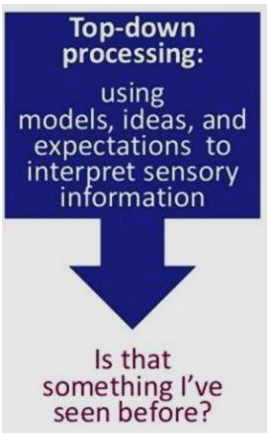
https://www.youtube.com/watch?v=4nwpU7GFYe8

Top-down and bottom-up processing



What's in this picture?





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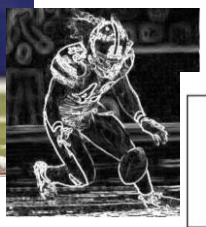
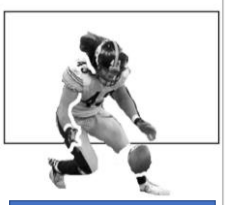
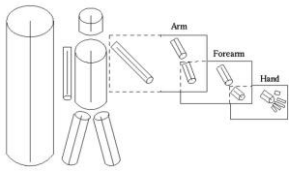
Three levels of description *(David Marr, 1982)*



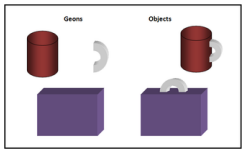
Stage 1- Primal Sketch



Stage 2 and 3- complete primal sketch + 2 ½ D sketch



Stage 4 – view independent sketch



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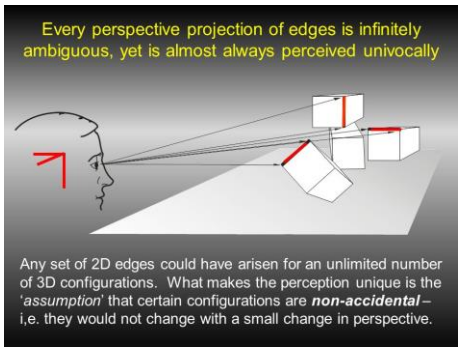
Modular *vs.* Distributed views of perception



Perceptual Constancy

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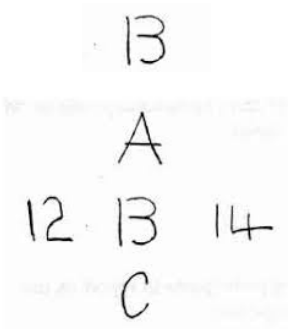
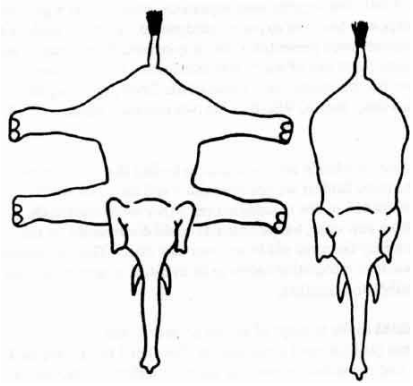
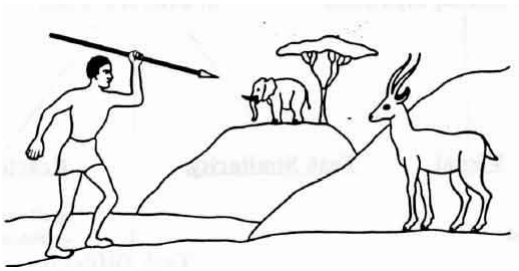
Perceptual Set







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A Sunday Afternoon on the Island of La Grande Jatte, George Seurat a French Impressionist

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Closure

https://www.youtube.com/watch?v=ummScwWcroI – Figure Ground Segregation

https://www.youtube.com/watch?v=Up5Fm4xLr8M – Common Fate

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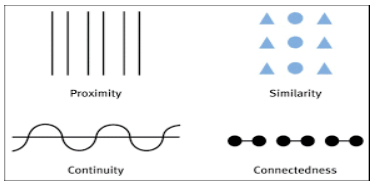
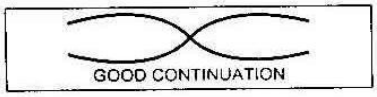
Gestalt Psychology – "Pregnanz" – simple , totality, whole percept

Principles and Segregation





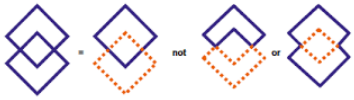


FIGURE 2.13
Symmetry: The human visual system tries to resolve complex scenes into combinations of simple, symmetrical shapes.

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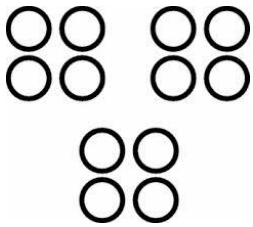
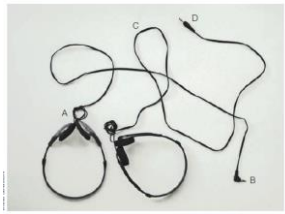
Gestalt Principles

Proximity



Continuation



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closure

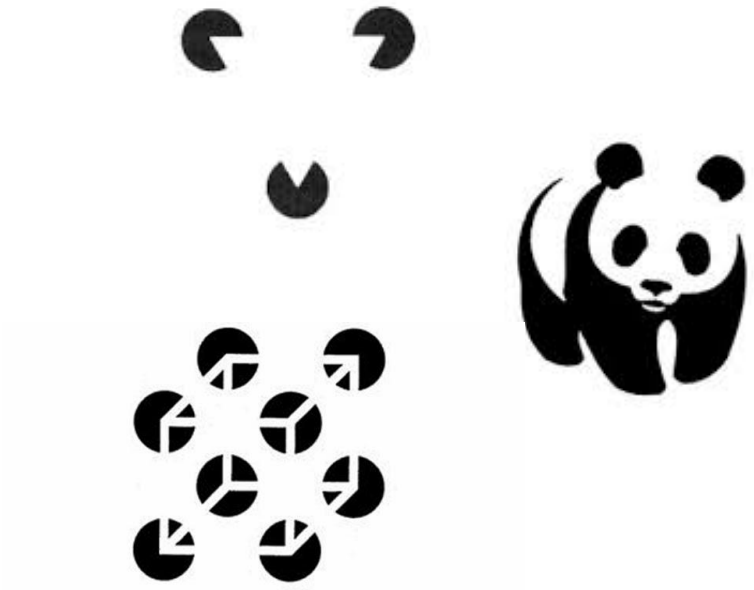

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Figure Ground Segregation

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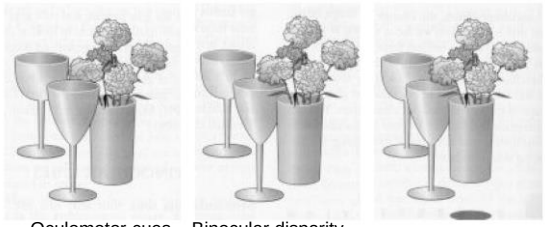


Oculomotor cues – Binocular disparity

Texture Gradient- Monocular

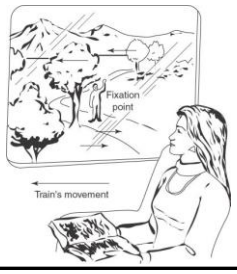
Occlusion

Atmospheric

Linear Perspective

Monocular – Relative cues

Motion Parallax



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From Individual to Group

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If such grouping leads to bad decision, why don't we quit?

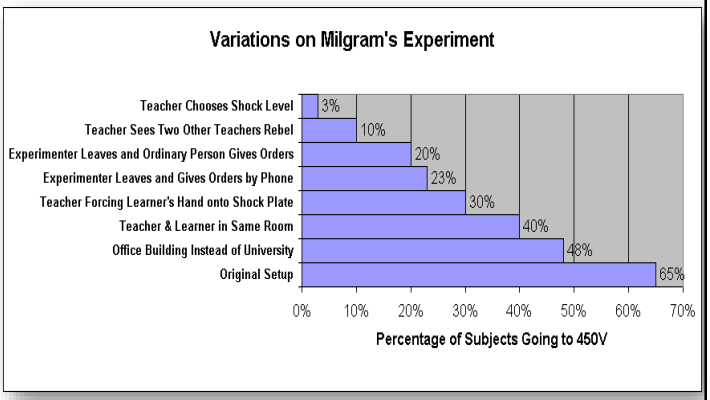
Conformity, but is always bad?

Asch Experiment

Stanford Prison Experiment

To some observers, some of the behaviors documented at Abu Ghraib prison in Iraq (photos at right) are eerily similar to those of Zimbardo's prison study (photos at left). Were the same processes of deindividuation at work?

Stanley Milgram Experiment – 1961 Stanford University



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Stereotyping: Automaticity than Controlled

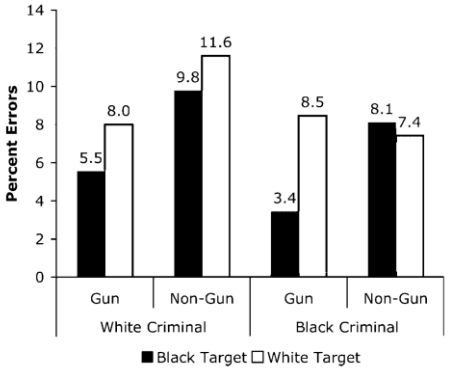

Figure 1. Frequency of errors as a function of Article Condition, Object Type, and Target Race, Study 1

Correll et al., 2002

- Implicit Association Tests shows 70% of white Americans find it easier to associate white faces with positive concepts such as “peace” and black faces with negative concepts such as “Bomb” than the other way around
- Surprisingly, 40% of African American show the same pattern

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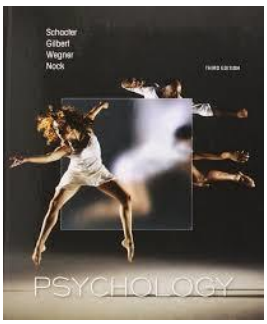
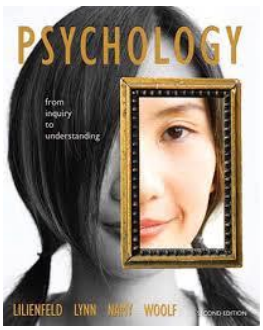
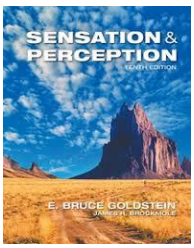

Schacter
Gilbert
Wegner
Nock
PSYCHOLOGY


PSYCHOLOGY
from
inquiry
to
understanding
LILIENFELD LYNN NAMY WOOLF


SENSATION &
PERCEPTION
E. BRUCE GOLDSTEIN

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