

ICS Mid

Slide 1

- Cognitive Science
- Cognition

Slide 2

- Sensation
- Perception
- Nervous System
 - Central
 - Peripheral
 - Sensory
 - Motor
 - Somatic
 - Autonomic
 - Sympathetic
 - Parasympathetic
- *Afferent vs Efferent*
- *Voluntary vs Involuntary*
- Neurons
 - Unipolar, pseudo-unipolar
 - Bipolar
 - Multipolar
 - **Diagram and parts**
- Thermo-receptors, Photoreceptors, Chemo-receptors, Mechano-receptors
- Action Potential
- Electrical vs Chemical Synapse [4]
- Localised vs Distributed Processes
- Neural Code/Schema
- **Tactile** - Importance
 - Free nerve ending
 - Basket Cell Receptor
- Thermo-receptors, Photoreceptors, Chemo-receptors, Mechano-receptors, Meissner's Corpuscle, Nociceptor, Pacinian Corpuscle
 - Tactile Perception - Somatosensory Cortex
 - Homunculus

- Tactile Acuity
- Phantom Limb Phenomenon
- Neural Plasticity
- Phantom Limb Pain
- Gate Theory of Pain

Slide 3

- **Gustation** - Importance
- Sweet, Sour, Salty, Bitter, Umami
- Taste, taste buds, papillae
- Labelled line vs Across fibre models
- Supertaster Paradox
- Food pairing, orthonasal, retronasal
- **Olfaction** - Importance
- Only system that bypasses thalamus
- Long cells send input to olfactory bulb in forebrain
- Learned Associations
- Cross-modal/Multisensory Integration

Slide 4

- **Auditory System** - Importance
- Function of outer, middle, inner ear
- Incus, Stapes and Malleus - smallest bones
- Vestibular System
- Cochlea
- Cilia, tonotopic map
- Basilar Membrane
- Organ of Corti
- Auditory Nerve
- Volley Theory of Harmonics
- Primary Auditory Cortex (PAC)
- Secondary Auditory Cortex
- Dual pathway - what and where
- **Broca's Area** - Speech Production — Non-fluent Aphasia
- **Wernicke's Area** - Speech Comprehension — Fluent Aphasia
- Frequency and Pitch
- Timbre

Slide 5

- Auditory Scene Analysis
- Cocktail Party Effect
- Auditory Hallucinations
 - Schizophrenia
 - Transient — excess caffeine
 - Muscular Ear Syndrome
 - Sensory Deprivation
 - Deprivation of Social Interaction
 - Heightened Emotional State
- Tinnitus : Causes [7]
- Protection from Tinnitus: [3]
- Hearing Loss:
 - Conductive
 - Sensorineural
 - Mixed

Slide 6

- Bottom-Up Perception — Data Driven
- Top-Down Perception — Theory Driven
- Feature Detectors
- Geons
- Recognition by Components Theory
- Perceptual Consistency
 - Size
 - Shape
- Helmholtz's Theory of Unconscious Inference — Likelihood principle, Environmental Assumptions
- Gestalt Theory - - Atomism, Holistic
 - Continuation
 - Pragnanz
 - Similarity
 - Proximity
 - Closure
 - Figure-Ground
 - Common Fate
- Psychophysics
- Just Noticeable Difference (JND)
- Psychometric Function
- Weber's Law

- Mirror Neurons

Slide 8

- **Perceptual Learning** — Goldstone
 - Long Term Changes
 - To Perception, not Belief
 - Results from practice and experience
- Mechanisms:
 - **Attentional Weighting**
 - Increase attention on important
 - Categorical perception
 - **Differentiation**
 - Newfound perception of difference
 - Psychophysical Differentiation
 - **Unitization**
 - Opposite of differentiation
 - **Stimulus Imprinting**
 - Detectors developed specific to stimuli
- **Brain**
- Forebrain:
 - Cerebrum
 - Thalamus
 - Hypothalamus
- Midbrain
- Hindbrain
 - Cerebellum
 - Pons
 - Medulla Oblongata
- Cortical Maturation
- Hemisphere Specialisation
- Early and late specialisation

Slide 9

- Behavioural Methods
 - Tests, questions
 - Physical measures too, like lie detector
 - Head Turn Method
 - Auditory Preference Studies
- Lesions
 - Study of regions using brain lesion cases
 - Problems [4]

- Animals
 - As the name suggests
- Recordings from Individual Cells
 - As the name suggests
 - Problems[3]
- EEG
 - Oldest modern, most established.
 - ERP
 - Problems[3]
 - MMN
 - Memory Trace
- MEG
 - EEG similar
 - Not very affordable
 - Very precise
- PET
 - Analyses energy consumption and blood flow
 - Injection of radioactive material
 - Problems[3]
- [f]MRI
 - Picture of brain with required emphasis
 - Voxels
- ECoG, iEEG
 - Electrodes in brain
 - Risky af
- TMS
 - Short electric pulses force brain to be active
- Optical Imaging
 - Infrared light used
 - Absorption and reflection shows brain activity

Brain Slide

- Anterior, Posterior, Rostral, Caudal, Dorsal, Ventral, Medial, Ipsilateral, Contralateral, Cross Section, Frontal Section
- Sulci, Gyri, Fissure
- Lobes:
 - Frontal
 - Memory
 - Emotions
 - Decision Making
 - Personality

- Parietal
 - Integration of senses
 - Spatial Awareness
 - Tactile
 - Gustatory
- Occipital
 - Vision
- Temporal
 - Auditory
 - Language Comprehension
- Forebrain
- Hindbrain
- Medulla
- Pons
- Cerebellum
- Midbrain
- Reticular Formation
- Hypothalamus
- Thalamus
- Limbic System
-

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- Phrenology
- Localism vs Holistic