

HS 303 : Psychology

16.7.18

Instructor : Mrinmayi Kulkarni

Text : —

Grading : M.S 40m  
E.S 40m

20m H.W : 2 x H.W

H.W - 2 is a Book Report

Psychology : Unit = Individual

→ Sociologist : Divides at Comm. level

Psychologist : → Collect Data from  
people, why ?

→ Sampling needed

→ Ebbinghaus : Recent Memory ...

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## Lecture 2

- Structuralism : Lab exp.
  - ↓ Scientific
  - Trying to quantify the unquantifiable
- ~
- ~
- Behaviourism
  - Measure units of behaviour
  - Kind of from Pablo
- Psychoanalysis : Freud.
- ↳ Crossroads b/w Philosophy & Medicine  
Psychology.
- APA: American psychological Association
  - 1st Psy. body
  -

## Fields of Psychology

- Biopsychology : Measure what happens in the Brain
  - like Neuroscience.

- Clinical Psychology
- Pathology : problems in behaviour
  - Person is dysfunctional
  - Diagnosis
  - Mental Problems
- Social Psychology
- Behaviour of Individual in a Social Group
- ex. Lynching Behaviour
- Industrial / Organizational
- Hiring & Firing
  - Disputes at Workplace
  - Game Wars?
- Cognitive Psychology
- Unconscious
- Health Psychology
- Narrow view : Hospital Setting
  - Broad : Health Behaviour
  - Entire body,  
Diabetes, Asthma
- ↳ Psychologist can help

## Practitioner

- Clinical Psychologist
  - Counselling
  - Psychiatry on the other hand:  
Hormones & Chemicals
- Counselling
  - Degree = Counselling Psychologists
  - Not Education counselling  
(Agent for sending students abroad)
- Education Psychologist
  - Behaviours in schools and uni
- Social Work
  - NGOs, Human Intervention at Police Stations
  - In hospitals, courts.
  - Places where Law is being enforced

→ Sports

- How to play better
- PhD in football Psychology

→ Industrial Organization

-

## Future

~~New~~ Environmental Psychology:  
ex How Architecture can be made  
people friendly

## Methods in Psychology

• Formulating Hyp. (A priori.: Before work)

- Inspired from prev. research
- Based on personal observation



Testing hyp. How?

→ The observational Method

ex Aggression in pre-school children

→ Video Record, use Multiple Raters  
⇒ Inter Rater Rel. ↑

Archival Analysis: Use Newspapers

ex How Women were portrayed  
in Advertisements over last  
100 years.

Correlational Method



- Not causalional.
- Just Measure env.

ex CPI & Personality traits

## Surveys

Sample & (Sampling error) → can't ask whole population

- Is the sub-set representative
- 1936 US presidential poll

## Literary Digest

- Sent out 80m Questionnaire
- Got back 2.5m
- oversampled Elite predicted Franklin Roosevelt loss

Gallup → Small sample but Right prediction

## Experimental Method

Test the effect of this.

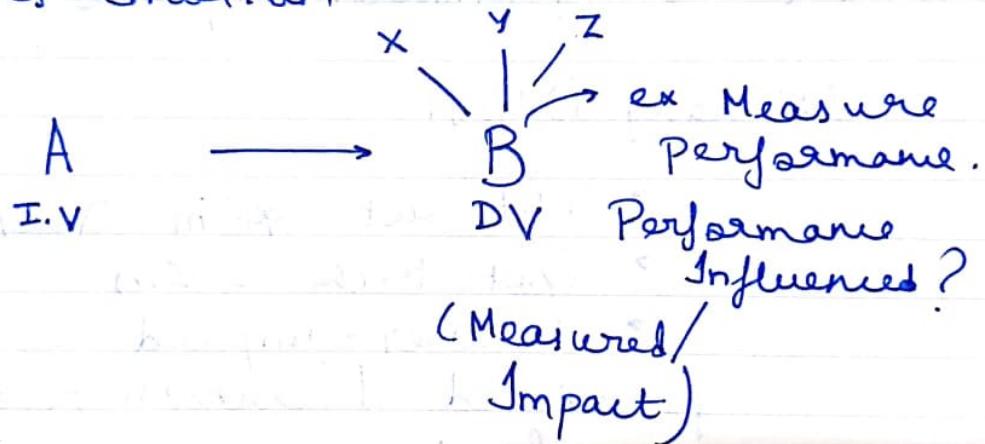
- IV → Independent Variable.
  - Sometimes Intervention not possible
- DV → Measure this

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## Lec 3

→ More on experimental method

- Trying to Establish Causality
- Lab: Control over var., Manipulating I.V
- Emotion prime used: Sit./Card that evokes emotion



- IV: Something that can be Naturally or Artificially changed
- Internal validity: Control for extraneous factors that can also affect DV
- External Validity
  - Lab setting introduces Artifacts
  - How Applicable are these exp. to

the real world.

- Before phen. added to books, must be verified numerous times.
- Cognitive Psychology more universal than Social Psych.
  - Cultural Aspect Important at Many places

### Ethics in Exp. Method

- Consent : Consent form
- Debriefing : Post Study : Tell them what study was really about
  - ex Study on Aggression : Don't tell them.
- Submit ~~Submit~~ Methodology to Review Board : They Appraise for Ethics etc.

# The Brain

→ Neuroimaging

1) PET

- ↑ Blood to a part ⇒ ↑ Activity
- Blood using radio-active Glucose

2) MRI

- proton Mag. field Alignment
- Subsequent Radio Wave emission

3) f-MRI, (4) C-T

## Imaging

→ MRI is good at localizing Activity in the Brain

• Issue : There is time lag, phenomenon gone by the time we observe.

• E.g: Electro Encephalograph is better for this.

- Brains enclosed Spinal Cord upward,

1<sup>st</sup> there was the hind brain, then the mid brain and the Cortex was the last to develop.

→ primates only

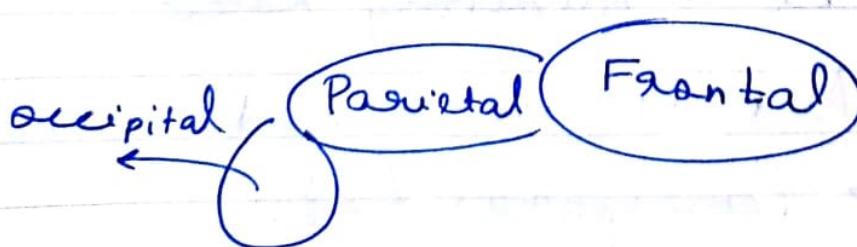
~~Hint~~

→ Cerebral Cortex: Forebrain

→ Gliaal cells form association Cortex, earlier thought to be unimportant now imp.

→ Inside the Cortex → M.B & H.B

Lobes in Cortex (Replicated in Left & Right Hemispheres)



In Motor area.

Broca's Area: Speech & language production

ex Understand language but can't speak it (Half Sided)  
→ Not symm.

- Prefrontal Cortex: Thinking, planning, executive dec., rational thinking conc. in 1 hemisphere (In Motor)
- Parietal lobe: Somato Sensory area: Sensory Area

Wernicke's Area: Language Comprehension (In sensory Area)

- Occipital lobe: Visual Cortex
- Cochlea → Auditory lobe  
→ Aud. Nerve → Aud. Cortex  
in Temporal lobe.



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- Frontal Lobe (Motor functions)
  - ↑ Representation to fingers and Mouth ( $\uparrow$  space)
  - Thumles  $\uparrow$
- Neural prosthetics: Exist as of today
- Grosser phen. in Brain, Left organs  $\rightarrow$  Right Hemisphere.
- In Schizophrenia: There is Activity in temporal lobe  $\rightarrow$  Voices heard are real to them.

→ M.B

Limbic System, Emotion

Pituitary, Hypothalamus, Hippocampus, Amyg.

b/w Cortex & hind brain

→ Cerebellum, etc pons, etc...  
.... hind brain

→ Hypothalamus: Hunger, ....  
• Rats keep coming back  
• New exp. SPY Mouse: controlled using stim.

→ Sense of smell (olfactory lobe) is located in the mid-brain.  
• logical since the sense developed early on (animals: crucial)

Midbrain = Limbic System

Amygdala: Emotional Center.

→ exp: Monkey Amygdala damaged

(case 1) Damage in this area: fearful, doubtful

(case 2) Damage here: Angry

Hippocampus: Explicit Memory

→ Memories that are being taken into storage

Pituitary Gland: Controls whole endocrine system

Hind Brain

→ Brain stem: Begins where spinal chord ends: Central core

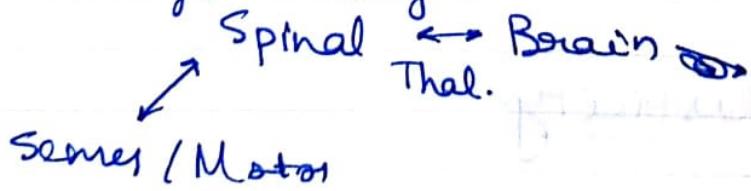
- Cerebellum : ??
- Medulla : Damaged in whiplash  
(e.g. Sudden car breaking) injuries, fatal strike on neck
- Pons : Controls movement, processes many variables, Gait, friction etc.  
Large in Rats. (Balance while walking)

- Crossover Point

- Nerves from left & Right hemispheres cross over.

Thalamus (part of hind brain, but also M. B.)

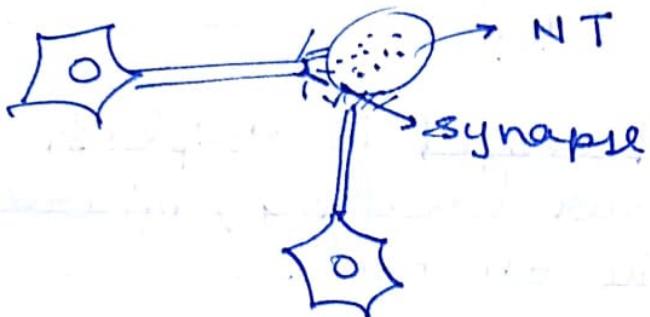
- Relays messages



### Cerebellum

ex Animals Maze Running, keeping track of movements

## Neurotransmitters



Dopamine: Lack of it causes Parkinson's Disease. Symptoms: Hand tremors, shuffling walk, face stiff

↓  
shuffling gate

Excess Dopamine: Schizophrenia ⇒ Hallucinations, psychoses  
Psychosis Patients given Dopamine suppressant: Show Parkinson's symptoms

## Brain Plasticity

→ Brain Neuron pathways / patterns / arrangements get modified every time we learn something.



Corpus Callosum : Hemisphere connecting tissue.

→ Hemispherotomies : One side Damaged

Left hemisphere damage → Right hand

Treatment : Tie up good hand,  
stimulate affected hand → Learn  
→ Other half (Undamaged parts) of  
brain may take over.

Deaf & Blind

→ For Blind people occipital lobe  
takes over touch (partly)

→ Bats : Use SONAR, have to conc.



→ Deaf people : Great ~~background~~  
peripheral vision (Auditory taking  
into on occipital).

Corpus Callosum Severing

→ Olden days (Ineffective) was used

→ Children ( $\uparrow$  Plasticity), grow normally

→ Adults Affected Permanently : hemisph can't talk.

III. Hand coordination & muscular control

→ Exercise: Draw Circle with Right hand & Square with left hand simultaneously

for 1 min & repeat again after 10 sec.

→ If it is difficult to draw circle & square simultaneously then draw circle first & then square.

→ If it is difficult to draw circle & square simultaneously then draw circle first & then square.

→ Now draw circle & square simultaneously.

2nd year

8.1.2022

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2nd year

→ Right hemisphere  
is concerned with visual field  
and visual detail

→ Left hemisphere  
is concerned with speech  
and language

→ Doesn't work well; Theory: Right  
and Left hemispheres interact

→ good at solving logic problems  
and mathematical problems

→ Shows "no adaptability"  
or "rigidness"

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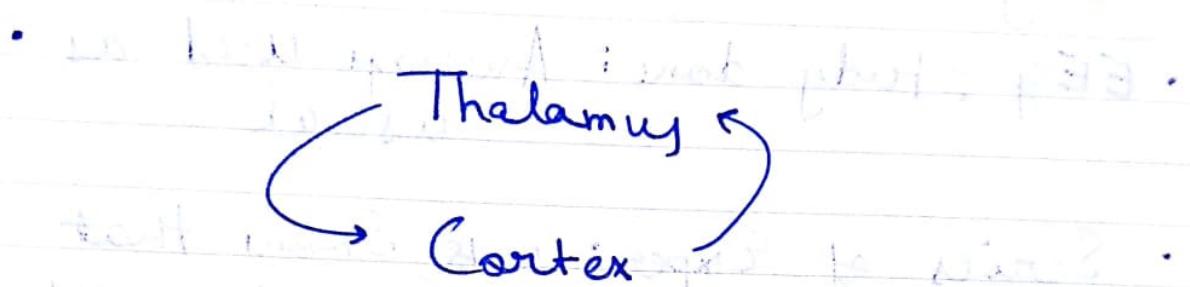
## Lecture 5

### Consciousness

- May mean Awareness
- Anæsthesia definition
- Dennet's Color phi: Awareness is like trace memory
- Hippocampus Damage
  - Hipp. Take Memories and Integrate into Storage
  - Take Present → Put this Recent past in Memory
- Hippo. Damage
  - Can't add events to long term memory → No Consciousness
  - Integration of Events ~~is~~ <sup>life</sup> is consciousness

## Visual Perception

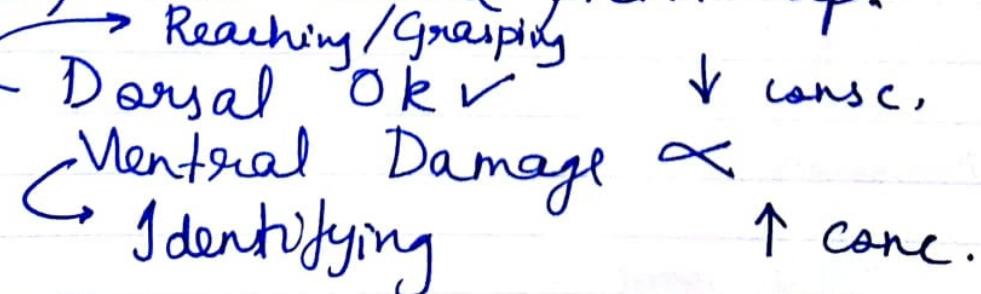
- We are capable of recognising new patterns w/o a prior template



- We need a time based short term memory trace to make sense of objects & patterns.

- Case of DF: Can See → Yes  
Can't make sense of objects using sight

ex Couldn't estimate size of Guitar pick, but could pick it up.



## Habit

- Consciousness associated with running units
- EEG study done: Average used as usual
- Series of Experiments Show that Actions may precede Consciousness  
(Or Atleast the Measure of Consciousness)
  - (Instinctive) way of Acting : Motor Cortex / Unconsc./spont.
  - Conscious way : Another pathway.

III  
notes on sleep and circadian rhythms

## Sleep: An alternate Conscience

→ U.S Navy Sleep experiment

14 hrs in bed  
Day 1: Slept 12 hrs (deficit)  
Day 2 onwards  
7.5 - 9 hrs

→ Working women: ↑ Sleep ⇒ better mood  
[Kahneman]

- Circadian Rhythms: Related to light  
→ 24 hr cycle of Sun

Wakeup in the Morning: light.

Suprachiasmatic Nucleus: Mid Brain

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Lecture 6

- Melatonin: Sleep hormone: ↑ around 9 pm
- Jet Lag: Circadian Rhythms Disrupted  
Sleepy, Hungry at odd times  
Exposure to Sunlight: Resets Clock

## Sleep Deprivation

- Dement. in Microsleep, losing conc. with eyes open

- REM sleep: Dream Stage with Brain waves similar to awake stage

### Stages of Sleep

Stage 4: Deep Sleep

Cycle through stages every 90min

Stage 1: hypnagogic → Jerky movements/ falling

2: Spikes

3: transition

4: Delta waves Deep sleep

Lucid dreaming: Brain waves don't

leave brain stem, we experience

Sleep paralysis

→ Begin

III

Psychology  
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- Deep Sleep.
- Night Terrors: Waking up in deep sleep
- Dreams: Stimuli around us become part of the dream (Inception)

Function of Dreamy → Slides

- Freed
- Sleep Dream (Symbols)
  - Allows pressure to escape in a controlled manner; Pressure Cooker Safety Valve.
- Cultural dep.

Manifest content & latent content

- Dreams express are an expression of Anxiety (exams)
- Sleep talking: common

- Sleep walking
- Electrical lighting : Reason to Stay Up.
  - Villages : Nothing to do sleep.
  - With devices & ~~light~~ their emitted light : Sleep ↓ and getting disrupted
  - Tribes in Tahiti tribe, sleep only 6 hrs
  - Hot places : Cultural Afternoon napping
  - Insomnia : fixed schedule is key
  - Use Yellow light to Relax
  - Narcolepsy : Neurological Disorders
    - Not Related to Depression

Sleep Apnea: frequent in premature born babies.

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## Lecture 7

### Reap: Sleep

→ Monozygotic twins have correlation in sleep patterns but not siblings/dizygotic

### Drugs

↓  
Depressant

→ Suppress

Symp. Nervous

↓  
Stimulants

↓  
Hallucinogen

Alcohol: Reduces self awareness/consciousness

→ Cerebellum: Drunken Gait  
: Can't coordinate to touch Nose

• Affects Hippocampus: No Recollection

## Barbituates

- Not with Alcohol, killed Presley?

## Opiates

- Overdose along with bodies natural
- Body stops producing Endorphins  
(Endorphins on Exercise)

## Stimulants

↳ Caffeine : Strong Coffee Vs Milky Coffee  
↳ Alertness ↑ then later ↓

- Nicotine : → Highly Addictive
- fast high → More so than many drugs  
⇒ Reinforcement
- Party Drugs → Meth Based

## Hallucinogens

- ⑥ → Slides
- Habituation / Drug tolerance
  - Must increase dosage for same effect → Addiction

## Addiction

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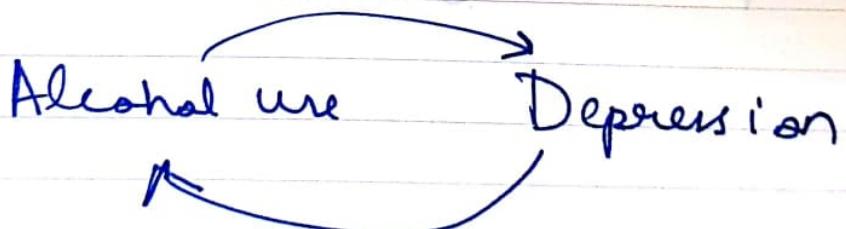
- Biological pre disposition present
  - Genes affect

DZ : Like siblings 2 sperm & 2 eggs

MZ : Identical Genome

- Genes identified that affect addiction
- Psych. Influence : Stress
  - Baby monkeys separated from Mothers. More likely to become Addicted to Alcohol

→



- Teens vulnerable to do what is considered Normal

ex Teens overestimate % of people taking Marijuana or other drugs.

- Lower Self Esteem → More likely to be influenced by peers

## Near Death Experience

(NDE)

- Common: Tunnel & Bright light at in center of visual field
- Out of body experience

- Brain Alive, HB stopped ⇒ Oxygen deprivation → May explain light in Visual Cortex