Unit 1

FYBA

Thinking Critically with Psychological Science.

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The need for psychological science

"Those who trust in their own wits are fools."

- Science based knowledge is more accurate than those based on intuition and common sense."
- Psychology tries to establish this fact through reasoned observation and experimentation.

Biases against Science

Following 3 phenomena pose a question mark on what is pure intuition?

1) hindsight bias

2) overconfidence bias

3) perceiving order in random events

Hindsight bias (I knew it all along)

These common sense polar statements may not always be true; they have to be studied and then arrive at generalisations.

- For eg. “Out of sight, out of mind” **vs** absence makes the heart grow fonder.

Discoveries have surprised us,
Nature has surprised us;
there is so much we don’t know.
(Anything seems commonplace, once explained.)

Overconfidence

For Eg.

1) WREAT 》》 WATER
   ETRYN 》》 ENTRY
   GRABE 》》 BARGE

2) Where is Thane located?
   Ans) To the north of Raigad & south of Palghar.

Many of us would feel the answers you know, are the obvious ones but when tested the results many times are unexpected.

Perceiving order in random events

- In actual, random sequences, patterns and streaks occur more often than people expect.

Therefore, order or symmetry is imposed on events.

" The really unusual day would be one where nothing unusual happens."

•Statistics can demystify randomness.

The scientific attitude

Curiosity
“ passion to explore universe”. Interest leading to enquiry

‘Science is based on the virtue of curiosity’

Curiosity

Humility
Need to accept the changes
and new findings.
Eg. Copernicus – geocentric model

what makes science a liberal study is Humility

Skeptical
Having or expressing doubt about something.

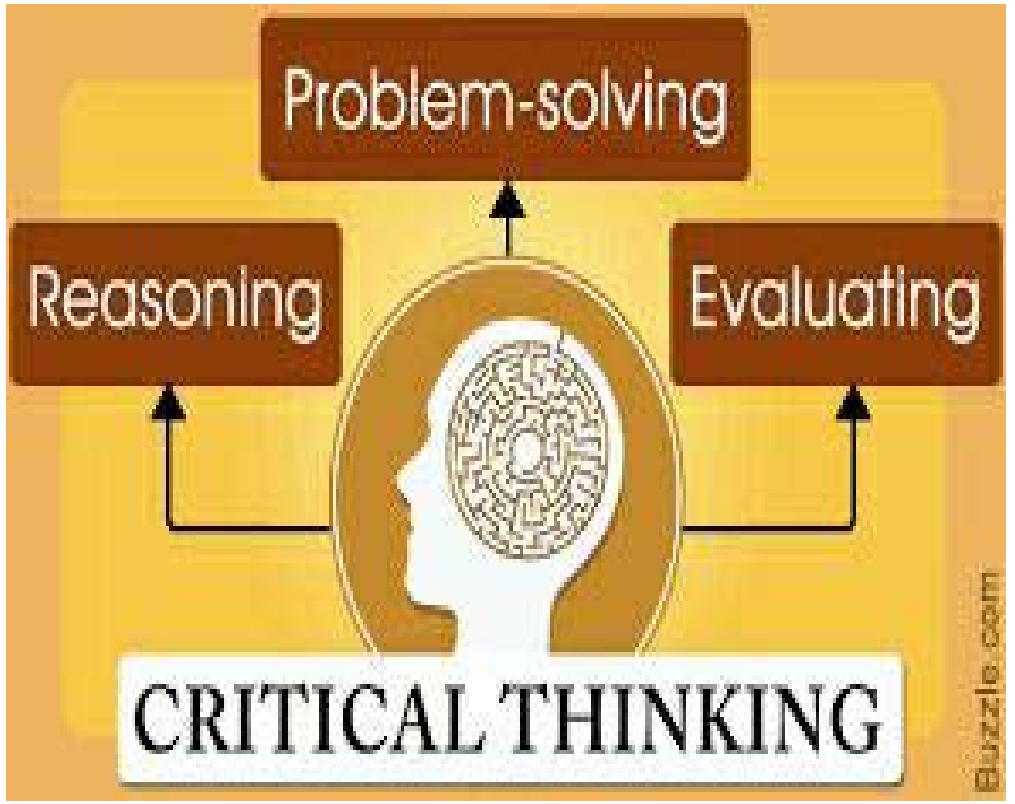
Eg. The Amazing Randi- the magician James Randi exemplifies skepticism. He has tested and debunked a variety of psychic phenomena.

The skeptical attitude is rooted in science

Critical thinking

- The real purpose of the scientific method is to make sure Nature hasn‘t misled you into thinking you know something you don’t actually know.

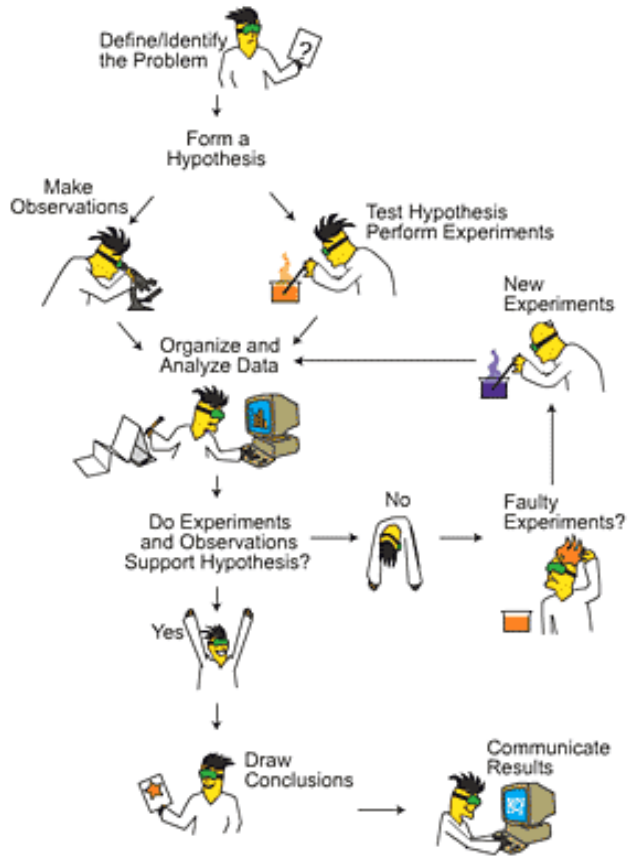
- Critical thinking examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions.



The scientific method

Theory
An explanation using an integrated set of principles that organises observations and predicts behaviour or events.

Operational definition
A statement of the procedures (operations) used to define research variables. For eg. Human intelligence may be operationally defined as – what the intelligence test measures.



Hypothesis
A testable prediction, often impedance by a theory.

Replication
Repeating the essence of a research study, usually with different participants in different situations, to see whether the basic finding extends to other participants and circumstances.

Case study
Am observation technique in which one person is studied in depth in the hope of revealing universal principles.

- Different expressions of scientific method :

1) Naturalistic observation

2) Case study

3) The Survey

4) Correlation

5) Experimentation

Naturalistic observation

Definition
Observing and recording behaviour in naturally occurring situations without trying to manipulate and control the situation.

Example
Observing people in a restaurant or airport to study social behaviour.

Advantages
• When observed naturally one might be able to track original behaviour.

• No external influence as the subject is unaware he is being studied.

Limitations
• Once aware of someone observing people can either become conscious of the actions or not really exhibit true behaviour.

• It‘s a time consuming process.

• The researcher would face difficulty in generalising one type of behaviour in one setting to the other.

Case study

Definition
An observation technique in which one person is tidied in depth in the hope of revealing universal principles.

Examples
Examining one patient suffering from a disorder to study in general symptoms and characteristics.

add example – Jean Piaget, to conduct his studies on cognitive development in children studied his own children during their growing years.

Advantages
- In depth information about a single person.
- Wide range of data across a broad spectrum but perhaps from a single perspective.

Limitations
- Individual cases may mislead us if the individual is atypical.
- Information not sufficient to generalise.

The survey

Definition
Survey is a technique for ascertaining the self reported attitudes or behaviours of a particular group, usually by questioning a representative, random sample of the group.

Example
Collecting responses of students through questionnaire to study their preferences of weekly tests over unit tests in the school curriculum.

Advantages
- Huge data collection at once – ease in generalising

Limitations
- Representative sample – if the group of participants is not diverse then it's difficult to generalise findings.
- Wording effect – the way the questions are framed can influence responses.

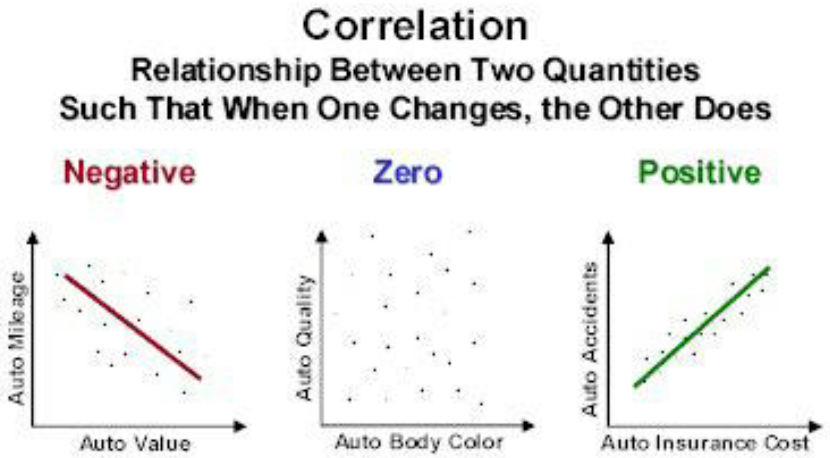
Correlation

Definition
A measure of the extent to which two factors vary together, and thus of how well either factor predicts the other.

Advantages
- Beneficial to establish relationships between two different variables.

Example
Exposure to violence increases aggression.
When exposure increases the tendency and magnitude of aggressive behaviour increases.

Attendance in lectures and scores are positively correlated; which means the more lectures attended would yield better scores.



Limitations
- The correlation and causation not necessary that one variable that is related to the other should be the cause of the latter.

Experimentation

Definition

A research methods in which an investigator manipulates one or more factors (independent variables) to observe the effect on some behaviour or mental process (the dependent variable). By random assignment of participants, the experimenter aims to control other relevant factors.

Advantages

- A more scientific method that provides reliable results that can be held true for a wide population.
- The experimenter is in charge and can nullify external influences by setting an appropriate set up.

Example

Participants are exposed to violence through media and then their aggression is studied.

Limitations

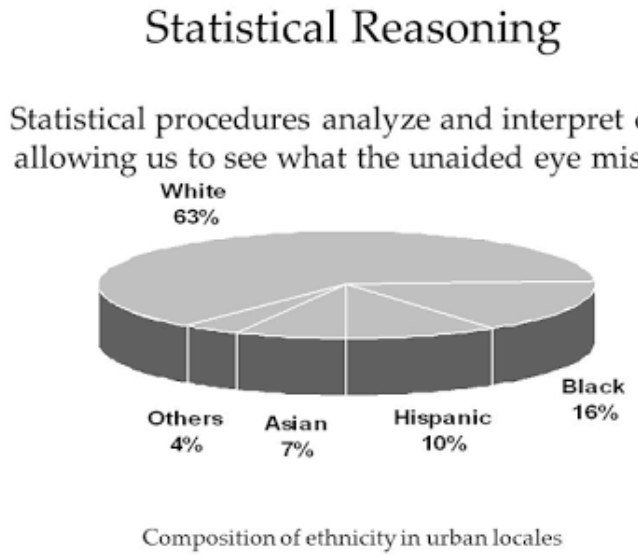
- Confounding variable – some influencing factors beyond experimenters control.
- Infrastructure required.
- Experimental group and it's random assignment.
- Placebo effect – experimental results caused by expectations alone,any effect on behaviour caused by the administration of an inert substance or condition, which the recipient assumes is is an active agent.

Statistical reasoning in everyday life

Statistics
the practice or science of collecting and analysing numerical data in large quantities, especially for the purpose of inferring proportions in a whole from those in a representative sample.

Importance of statistics
It is **important** for researchers and also consumers of research to understand **statistics** so that they can be informed, evaluate the credibility and usefulness of information, and make appropriate decisions.

Use of statistics in everyday reasoning in decision making
Statistics gives us data inferences dichroic can be implied in decision making; it makes people aware of the current trends and also provides feedback on which work can be done to arrive at proper conclusions.



Composition of ethnicity in urban locales

Example
To study ethnic population of an area statistics could be used; which could aid in the procedure of policy formulation, law making and providing social security to minorities.

Describing data

Measure of central tendency
In a distribution those values that have a tendency to fall around the centre.

Mode – the most frequently occurring score in a distribution.

Mean – the arithmetic average of a distribution, obtained by adding the scores and then dividing by the number of scores.

Median – the middle score in a distribution; half the scores are above it and half are below it.

Measures of variation
It helps to know something about the variation in the data – how similar or diverse the scores are.

Standard deviation – more useful standard of measuring how much scores deviate from one another.

Normal curve – large numbers of data – heights, weights, intelligence scores, grades often former a symmetrical, bell shaped distribution as a curve called normal curve.

FAQs about psychology (Discussion)

- How far statistical results are accurate?
- Can laboratory experiments illuminate everyday life?
- Does behaviour depend upon one's culture and gender?
- Why do psychologists study animals and what ethical guidelines safeguard human and animal research participants?
- Is psychology free of value judgements?

What you have learnt

- How do hindsight bias, overconfidence, and the tendency to perceive order in random events illustrate why science based answers are more valid than those based on intuition and common sense?
- How do the scientific attitude‘s three main components relate to critical thinking?
- How do theories advance psychological science?
- How do psychologists use case studies, naturalistic observation and surveys to observe and describe behaviour, and why is random sampling important?
- How can we describe data with measures of central tendency and variation?

Lets learn More….