

MPC-005

Research Methods in Psychology

BLOCK 1 — Crash Course (Exam-Focused)

Introduction to Research Methods in Psychology

Units: Basic Concepts | Reliability & Validity | Variables & Constructs | Hypothesis & Sampling

UNIT 1**Basic Process / Concepts in Research**

What is research? • Criteria & qualities • Biases • Steps in research process

UNIT 2**Reliability & Validity**

5 methods of reliability • 6 types of validity • Threats (Internal & External)

UNIT 3**Variables & Constructs**

Types of variables • IV vs DV • Extraneous vs Confounding • Constructs

UNIT 4**Hypothesis Formulation & Sampling**

Null vs Alt hypothesis • Type I / II errors • Probability vs Non-probability sampling

More stars = more often asked. Master the 5-star topics first.

Topic	Unit	Times Asked	Marks (typical)	Priority
Steps in Research Process	1	7+	10	★★★★★
Methods of Estimating Reliability	2	7	6 – 10	★★★★★
Sampling Methods	4	7	8 – 10	★★★★★
Criteria / Qualities of Good Research	1	10 (mostly short note)	3 – 8	★★★★★
Threats to Internal Validity	2	6	4 – 6	★★★★★
Types of Variables	3	5	6 – 10	★★★★★
Types of Hypothesis + Errors	4	5	3 – 6	★★★★
Types of Validity	2	3	6 – 8	★★★★
Variables vs Constructs / Types of Constructs	3	3 each	3 – 6	★★★★
Research Biases Difficulties in Hypothesis	1, 4	2 – 3	3	★★★

Definition (PYQ favorite)

Research = Re + Search
= searching again and again, systematically.

A systematic, controlled, empirical investigation of relationships between variables (Kerlinger, 1973).

Simple Example

Buying a phone?
You read reviews, compare features, ask friends.

That is informal research.
Scientific research = same logic + systematic + objective + replicable.

Why Research in Psychology?

- Replaces opinion with FACTS
 - Claim: 'Reels weaken babies' — true or false? Test it.
- Solves real problems
 - Mental health, learning difficulties, addiction
- Improves treatments & therapies
- Predicts & explains behaviour
- Builds the science of psychology

Think of research like a recipe — clear, replicable, well-planned.

1

Purpose clearly defined

Every concept used must be operationally defined.

2

Procedure precisely planned

So others can replicate the study.

3

Research design carefully planned

To maintain objectivity in results.

4

Frank, transparent reporting

Limitations and biases openly stated.

5

Adequate data analysis

Method matches the data type.

6

Validity & reliability examined

Always check the measuring tool.

Asked together with 'criteria' — easy 8-mark answer if you know all six.

Systematic

Follows a set sequence of steps; no guessing or intuition.

Valid & Verifiable

Uses reliable instruments; results can be checked by others.

Theory-developing

Generalises findings into theories and principles.

Empirical

Conclusions based on real-world evidence and observation.

Logical

Guided by rules of reasoning — induction & deduction.

Replicable

Procedures and results can be repeated by other researchers.

Context of DISCOVERY

Phase 1 — Getting an idea.

Observation, beliefs, intuition, reading,
general knowledge → leads to a NEW idea
or a different way of thinking.

Example: A psychologist notices that students
who sleep less seem to forget more.
→ Idea is born here.

Context of JUSTIFICATION

Phase 2 — Testing the idea.

Use the SCIENTIFIC METHOD to test:
design study, collect data, analyse, conclude.

Example: Run an experiment — give one group
8 hrs sleep, another 4 hrs, test their memory.
→ Idea is proved or disproved here.

Tip: Hypothesis & Paradigm sit in BOTH contexts.

THEORY

A body of inter-related principles that explains and predicts a phenomenon.

Example

Example: 'Regular exercise improves mental health.'

HYPOTHESIS

A tentative, testable statement about the relationship between two or more variables.

Example

Example: 'Students who exercise 30 min/day have lower anxiety scores.'

Theory = the book you read | Hypothesis = one page you want to verify

Bias = personal preference, belief, or expectation that distorts results.

PERSONAL Bias

Researcher's own beliefs/values colour the interpretation.

e.g. A coffee-lover may unconsciously highlight only positive effects of caffeine.

OBSERVER Bias

Researcher's culture/expectations shape what they notice.

e.g. A teacher who 'expects' Section A to do better rates them more leniently.

EXPECTANCY Bias

participant reacts to what they expect to find.

e.g. Hawthorne effect — workers improve simply because they know they're being watched.

PLACEBO Bias

People feel better just because they believe they got treatment.

e.g. Patients given a sugar pill report less pain when told it's a real painkiller.

Per IGNOU Block 1: 4 main safeguards. Memorise them as PSO+B.

PROCEDURAL SAFEGUARDS

Keep complete records of all observations & analyses so others can verify.

e.g. video-record sessions, log every step.

STANDARDISATION

Use uniform, consistent procedures for ALL participants.

e.g. read the same instructions to every subject.

OPERATIONAL DEFINITIONS

Define abstract concepts in measurable, observable terms.

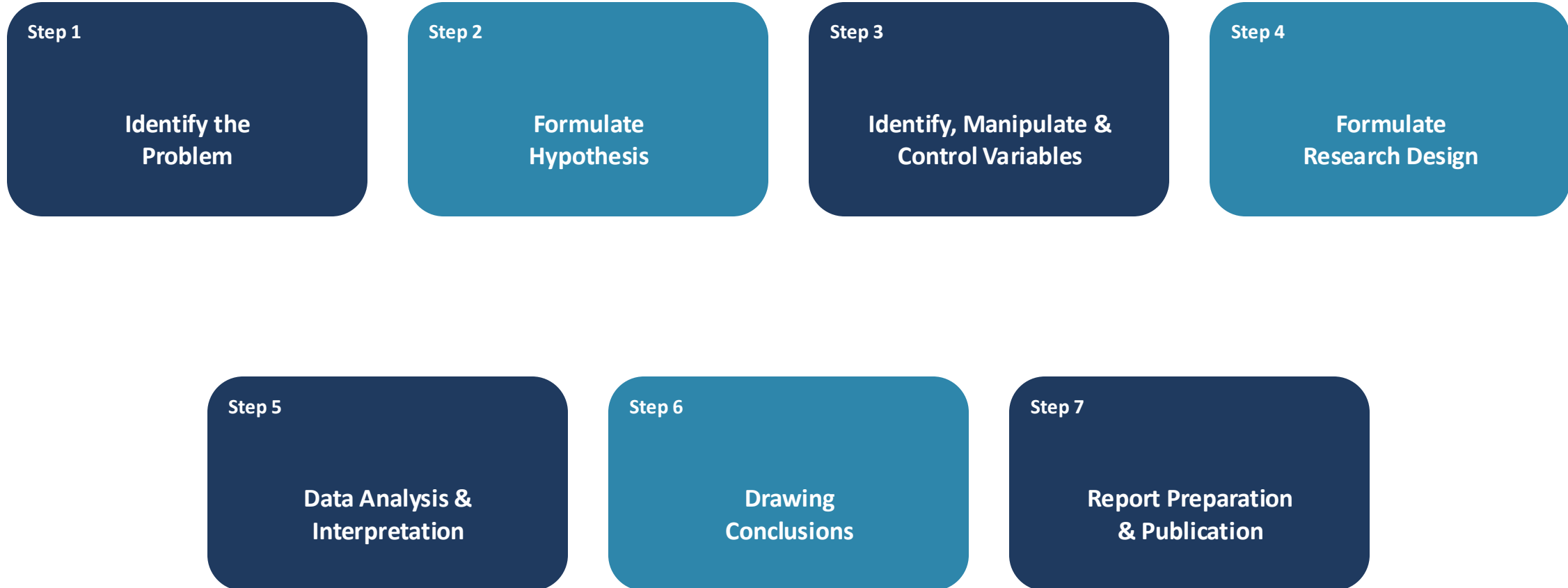
Don't say 'anxiety' — say 'score on Hamilton Anxiety Scale.'

AVOIDING BIAS (Control + Blind)

Use control groups and blind / double-blind procedures.

Neither participant nor researcher knows who got the drug.

Most-asked 10-mark question across 11 years. Memorise the order!



Memory hook: Problem → Hypothesis → Variables → Design → Analysis → Conclusion → Report

Step 1 — Identify the Problem

- Sources: personal experience, observation, prior research, theories, social issues.
- Use literature review to find a 'gap' worth researching.
- Question must be FINER:
 - Feasible | Interesting | Novel | Ethical | Relevant
- Bad: 'Why do students fail?' (too vague)
- Good: 'Does sleep deprivation affect memory in college students?'

Step 2 — Formulate Hypothesis

- A tentative, testable statement of relationship between variables.
- Derived from: prior research, theory, observation.
- Must be: testable, specific, falsifiable, theory-grounded.
- MUST be formulated BEFORE data collection.
- Example: 'Students sleeping 8 hrs score higher on memory tests than those sleeping <5 hrs.'

Step 3 — Identify, Manipulate & Control Variables

- IV (independent) — what you manipulate / select.
- DV (dependent) — what you measure as outcome.
- Extraneous — uncontrolled, can mask the IV→DV link.
- Operationalise every variable in measurable terms.
- Example: Q. Does noise affect concentration?
 - IV = noise level | DV = concentration score
 - Extraneous = temperature, mood, time of day

Step 4 — Formulate Research Design

- The blueprint of HOW you'll answer the question.
- Includes 3 sub-tasks:
 - Construct measurement tools (tests, questionnaires)
 - Sample selection — who, how many, how chosen
 - Data collection procedure — when, where, how standardised
- Goal: maximise control of extraneous variables.
- Analogy: planning a wedding — venue, guests, budget, timeline.

Step 5 — Data Analysis & Interpretation

- Make sense of collected data.
- Quantitative — stats (mean, t-test, correlation).
- Qualitative — themes, patterns from interviews/observations.
- Choose parametric vs non-parametric depending on data type.
- Goal: usually to REJECT the null hypothesis.

Step 6 — Drawing Conclusions

- Accept or reject the hypothesis.
- Interpret what the findings mean.
- Relate back to existing theories.
- Acknowledge LIMITATIONS honestly.
- Suggest directions for FUTURE research.

Step 7 — Report Preparation & Publication

- Allows replication and accountability.
- Format: Title • Abstract • Introduction • Method • Results • Discussion • References.
- Published in: journals, books, conferences, theses.
- Makes science PUBLIC — others can build on it.

Definition

Reliability = the DEGREE to which an instrument gives the SAME result when used REPEATEDLY under the SAME conditions on the SAME subjects.
(Anastasi, 1957: 'consistency of scores on different occasions.')

Why It Matters — Bathroom Scale Example

RELIABLE scale

Shows 65 kg every time you step on it.
Day 1: 65 kg | Day 2: 65 kg | Day 3: 65 kg

Result is CONSISTENT.
→ This is reliability.

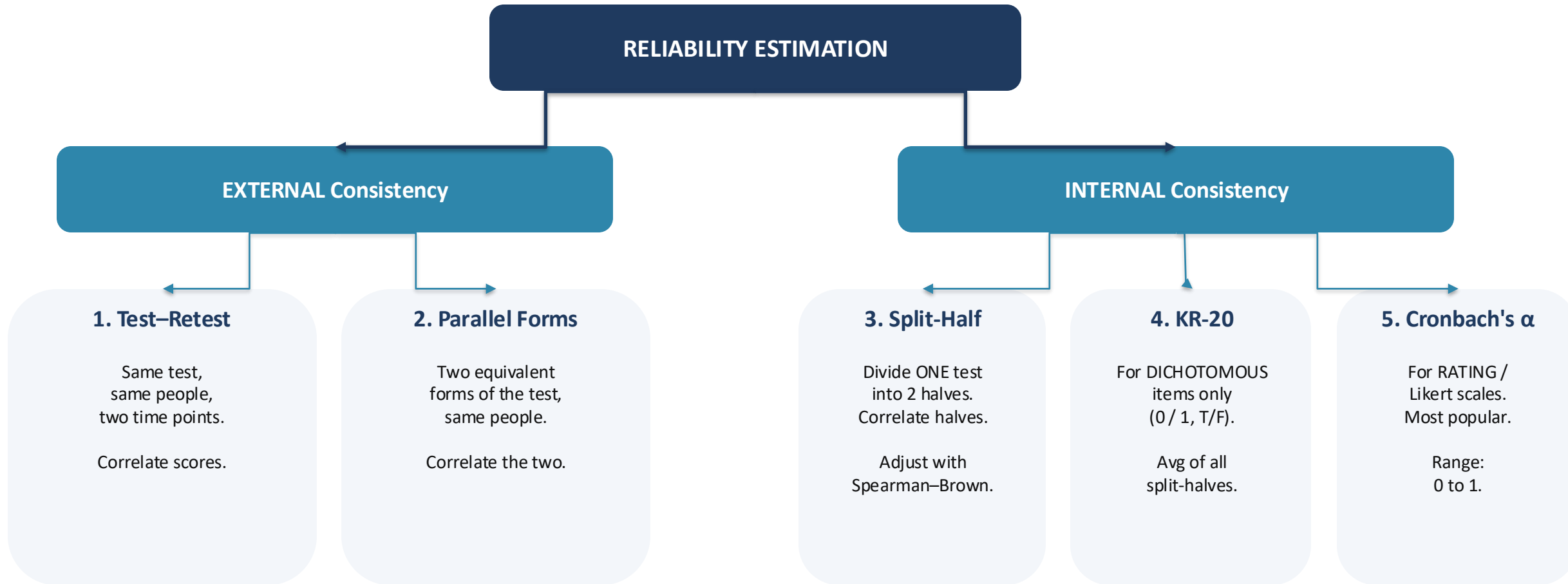
UNRELIABLE scale

Shows different weight each time.
Day 1: 65 | Day 2: 71 | Day 3: 60

Cannot trust any reading.
→ Useless for research.

Key rule: Reliability is NECESSARY but NOT SUFFICIENT for validity.

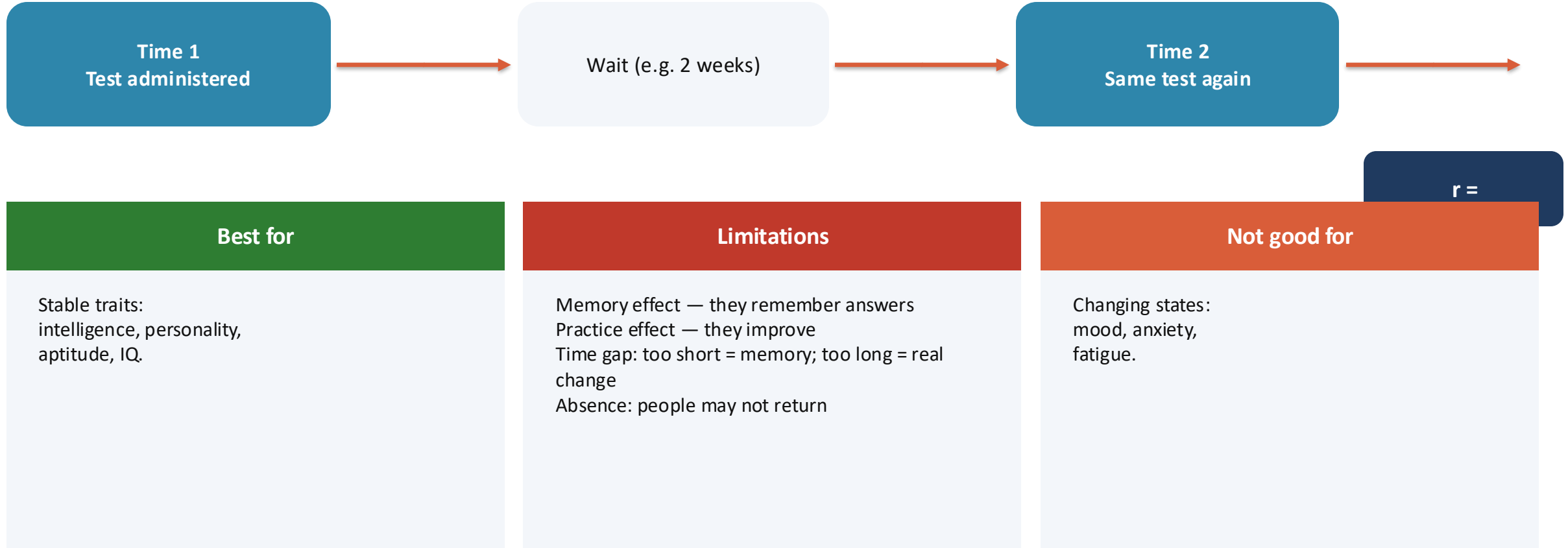
Asked 7 times in PYQs (2011–22). Memorise this tree exactly.



Tip: External = different occasions. Internal = within the same test.

1. Test–Retest Reliability

Same test → Same people → Two different time points → Correlate the scores.



Real-life analogy: taking your blood pressure twice in a row — both readings should match.

2. Parallel-Forms Reliability

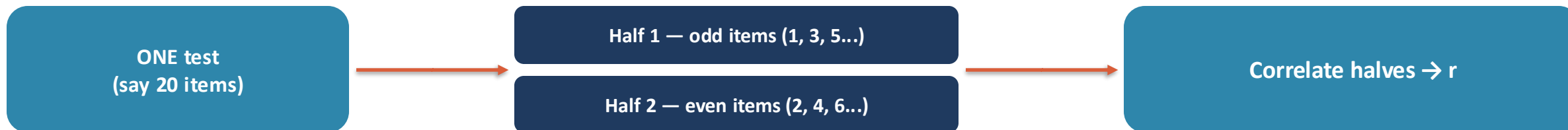
TWO equivalent forms of the same test → same people → correlate scores.



- Both forms measure the SAME attribute (different items, same difficulty).
- Pearson correlation between scores on Form A & Form B = reliability coefficient.
- Solves the memory/practice problem of test–retest.
- Considered ONE OF THE MOST RIGOROUS reliability measures.
- Limitation: building two equivalent forms is hard and expensive.
- Other names: Alternate forms, Equivalent forms, Comparable forms.

3. Split-Half Reliability + Spearman–Brown Formula

Divide ONE test into two halves → correlate the halves → adjust with Spearman–Brown.



Spearman–Brown Adjustment

$r(\text{adjusted}) = (2 \times r) / (1 + r)$ — corrects for the fact that we used only HALF the test.

Advantages

- Only ONE test administration needed.
- No memory effect issue (one sitting).
- Quick and economical.

Limitations

- Different ways of splitting → different results.
- Less reliable for SHORT tests.
- Best used on long tests.

KR-20 (Kuder-Richardson)**When to use**

Items scored DICHOTOMOUSLY (0/1).

→ True/False, Yes/No, Right/Wrong.

How it works

Computes the AVERAGE of all possible split-half coefficients.
Considers item difficulty ($p \cdot q$).

Use case

Multiple-choice tests, achievement tests, dichotomous questionnaires.

Cronbach's Alpha (α)**When to use**

RATING / Likert scales (multiple options).

→ 'Strongly Agree → Strongly Disagree' (1–5).

How it works

Extension of KR-20 for non-dichotomous items.
Mean of ALL possible split-half coefficients.
Range: 0.00 to 1.00 (≥ 0.70 = acceptable).

Use case

Personality scales, attitude scales, satisfaction surveys — most common in psychology.

Reliability Methods at a Glance — Comparison Table

Method	Category	How	Best For	Watch Out For
Test-Retest	External	Same test, twice	Stable traits (IQ, personality)	Memory & practice effects
Parallel Forms	External	Two equivalent forms	When two forms exist	Hard to build equivalent forms
Split-Half	Internal	Halve the test, correlate	Long tests	Different splits → different r
KR-20	Internal	Avg of all splits (0/1 items)	T/F, MCQ tests	Only dichotomous items
Cronbach's α	Internal	Avg of all splits (any scale)	Likert / rating scales	Sensitive to item count

Memory hook for the 5 methods: TR – PF – SH – KR – C α
(Test-Retest, Parallel Forms, Split-Half, KR-20, Cronbach's Alpha)

Definition

Validity = the degree to which a test measures WHAT IT CLAIMS to measure.
(Cronbach, 1951)

Reliability vs Validity

	RELIABILITY	VALIDITY
Meaning	Consistency of measurement	Accuracy of measurement
Question it answers	Does it give the SAME result?	Does it measure the RIGHT thing?
Bathroom scale showing 65 kg every time, but you actually weigh 70 kg	Reliable ✓	NOT Valid ✗
Relationship	Reliability ≠ Validity	Reliability is necessary BUT not sufficient for validity

VALIDITY

CONTENT

Does the test cover ALL aspects of the construct?

e.g. Driving test must cover signs, rules, parking, highway.

CRITERION-RELATED

Test predicts/relates to an external criterion.

Concurrent (now) | Predictive (future)

CONSTRUCT

Does it actually measure the theoretical construct?

Convergent (similar tests agree) | Discriminant (different tests don't)

FACE

Does it LOOK like it measures what it should?
(weakest)

e.g. Math test full of math problems.

INTERNAL

Are observed effects truly due to the IV?

Cause-effect logic. Watch for confounding.

EXTERNAL

Can findings be GENERALISED to other people,
settings, times?

Lab study → real classroom.

Internal validity = confidence that DV changes are caused by the IV (and nothing else).

1. Confounding

Two variables intertwined; can't tell which caused the effect.

3. History

External event during study (e.g. lockdown) changes participants.

5. Repeated Testing

Practice / familiarity from taking tests multiple times.

7. Regression to Mean

Extreme scorers move toward average on retest.

9. Diffusion

Treatment 'leaks' from experimental to control group.

11. Experimenter Bias

Researcher unconsciously treats groups differently.

2. Selection Bias

Groups were already different at the start.

4. Maturation

Participants naturally change with time (growth, fatigue).

6. Instrument Change

Measurement tool changed mid-study.

8. Mortality

Participants drop out — unequal between groups.

10. Compensatory Rivalry / Resentful Demoralisation

Control group works extra hard — or gives up — when they realise they're 'losing.'

External validity = can findings be GENERALISED beyond the study? (other people, settings, times)

McBurney & White (2007): External validity concerns whether the results can be generalised to other situations, subjects, settings, and times.

5 Threats (per IGNOU Block 1)

Aptitude–Treatment Interaction (ATI)

Sample has unique features (e.g. only volunteers, only highly depressed) — limits generalisation.

Situations

Study-specific factors: light, noise, location, experimenter, time.

Pre-Test Effects

Effect found only because participants were tested before the treatment.

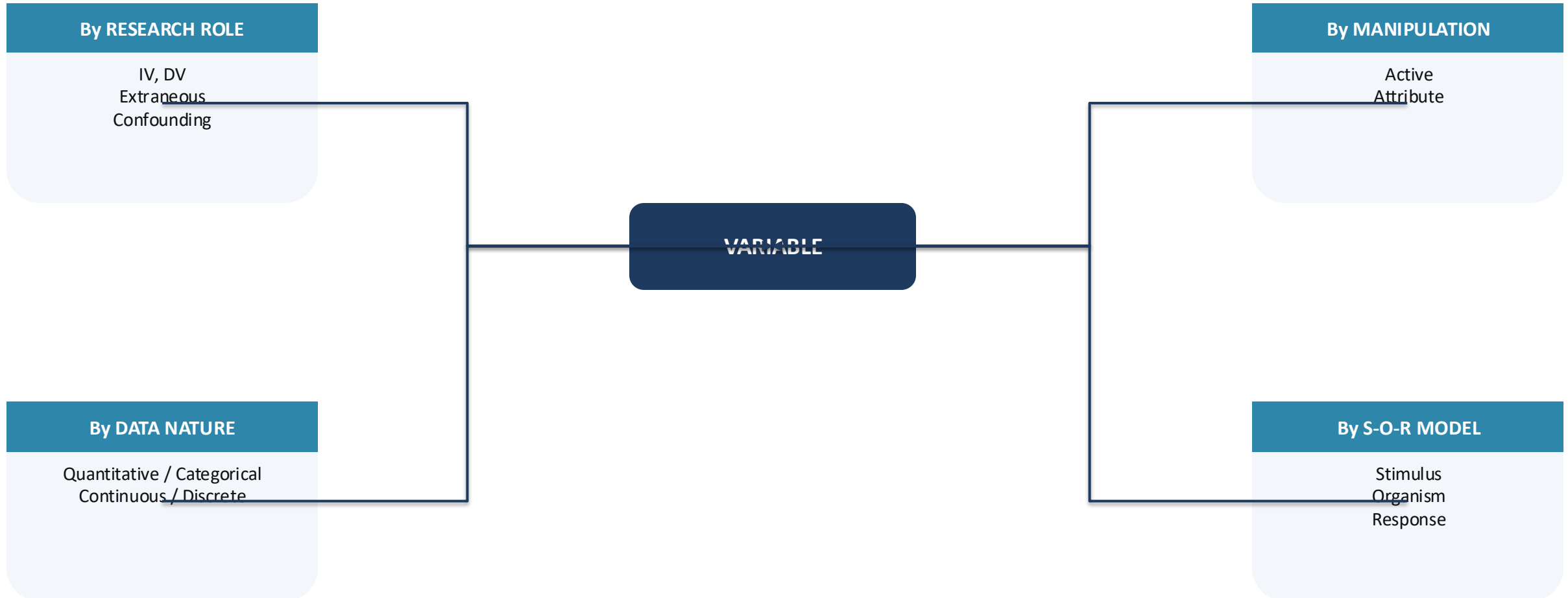
Post-Test Effects

Effect found only because of the post-test process itself.

Rosenthal Effects

Findings can't be generalised to other investigators / experimenters.

Variable = a property that can take DIFFERENT VALUES (Kerlinger). E.g. age, mood, IQ, height.



Independent (IV) vs Dependent (DV) Variables

Independent Variable (IV)

- The CAUSE / input.
- Manipulated or selected by the researcher.
- Examples: teaching method, drug dose, noise level, hours of sleep.

Dependent Variable (DV)

- The EFFECT / outcome.
- Measured by the researcher.
- Examples: test score, anxiety level, reaction time, memory recall.

Quick Practice — Identify the IV and DV

Research Question	IV	DV
Does exercise improve mood?	Exercise (yes/no, amount)	Mood score
Does class size affect learning?	Class size (20 / 40 / 60)	Test score
Does coffee improve alertness?	Coffee (cup/no cup)	Alertness score
Does noise affect concentration?	Noise level (dB)	Concentration score

Memory hook: 'I VARY (IV) → see the DIFFERENCE (DV).' Graph rule: IV on X-axis, DV on Y-axis.

Any variable OTHER than the IV that may affect the DV — and 'mask' the true IV→DV relationship.

3 Major Types (per IGNOU Block 1)

Organismic Variables

Subject-related characteristics.

e.g. Age, sex, intelligence, personality, motivation.

Situational Variables

Environmental factors in the experimental setting.

e.g. Noise, temperature, humidity, lighting, time of day.

Sequential Variables

Order/sequence effects when participants take multiple conditions.

e.g. fatigue, practice from earlier trials.

	EXTRANEOUS	CONFOUNDING
What it is	Any 'other' variable that COULD affect the DV	An extraneous that ACTUALLY varied with the IV
Effect on DV	May or may not affect DV	Has affected the DV — distorts the result
Detection	Often suspected in advance	Discovered after the fact — wrecks the conclusion
Control	Can be controlled (random assignment, matching)	Hard to fix once it has occurred
Relationship	ALL confounding variables are extraneous	But not all extraneous are confounding

Example

Study: Effect of EXERCISE (IV) on STRESS (DV).

But participants who exercised more also slept better.

→ Sleep is now CONFOUNDED with exercise.

Result: We can't tell if stress dropped due to exercise OR due to better sleep.

ACTIVE Variables

Variables researchers can MANIPULATE.

Examples:

- Teaching method (assign to method A or B)
- Drug dosage (assign 5 mg / 10 mg / 15 mg)
- Type of therapy (CBT vs psychodynamic)
- Reward / punishment (give or withhold)
- Amount of practice (1 hr vs 3 hrs)

Researcher **CREATES** the groups.

ATTRIBUTE Variables

Variables researchers can only MEASURE.

Examples (inherent traits — can't change):

- Gender
- Age
- Intelligence (IQ)
- Socio-economic status
- Personality type

Researcher **SELECTS** existing groups.

Quantitative = varies in AMOUNT (how much). Categorical = varies in KIND (what type).

QUANTITATIVE

Examples:

- Age (25 yrs)
- Height (170 cm)
- Income (₹50 000)
- IQ score (120)
- Reaction time (2.5 sec)

Math operations work — you can take an average.

CATEGORICAL

Examples:

- Gender (M / F / Other)
- Religion (Hindu, Muslim, Christian...)
- Blood type (A / B / AB / O)
- Diagnosis (Depressed / Anxious / Healthy)

Math doesn't work — average of M+F = ?

Categorical Variables — 3 Sub-types (per IGNOU Block 1)

CONSTANT — only ONE category

e.g. taxi, tree

DICHOTOMOUS — TWO categories

e.g. Yes/No, Good/Bad

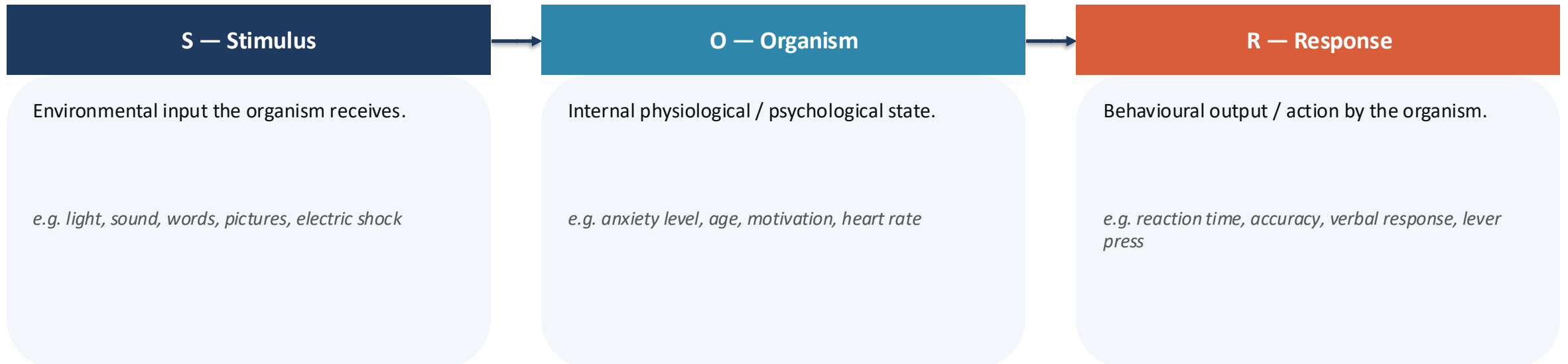
POLYTOMOUS — MORE than two categories

e.g. Religion, Attitude scale

Continuous vs Discrete (sub-types of Quantitative variables)

	CONTINUOUS	DISCRETE
Definition	Can take ANY value within a range	Only SPECIFIC, countable values
Decimals?	Yes (170.5, 65.32 kg)	No (whole numbers only)
Examples	Height, weight, time, temperature	No. of children, no. of correct answers, no. of students

S-O-R Model (Stimulus → Organism → Response)



Construct = a CONCEPT specially invented for scientific use (Kerlinger).
Constructs are abstract — we can't see them; we infer them from behaviour.

	VARIABLE	CONSTRUCT
Nature	Tangible, observable	Abstract, theoretical
Measurability	Directly measurable	Cannot be directly observed
Examples	Height, weight, reaction time, age	Intelligence, anxiety, motivation, self-esteem
Use	Building block of the study	Part of theoretical framework
Operationalisation	Already in measurable form	Must be operationalised before measurement

Example: 'INTELLIGENCE' is a CONSTRUCT — you can't see it.
 But you can MEASURE it through variables: IQ test scores, problem-solving accuracy, academic grades.

Concept	Quick Definition	Memory Hook
IV	What you change	I VARY
DV	What you measure	DIFFERENCE
Extraneous	Other factors that COULD affect DV	Could mess things up
Confounding	Extraneous that DID affect DV	Did mess things up
Active	Manipulable	Researcher creates groups
Attribute	Measurable only	Researcher selects groups
Quantitative	Numbers	How much
Categorical	Categories	What kind
Continuous	Any value (decimals OK)	Smooth scale
Discrete	Only specific values	Whole numbers
Construct	Abstract concept (e.g. anxiety)	Can't see it

What is a Hypothesis? + Its 6 Characteristics

A tentative, testable statement of the relationship between two or more variables.
(Kerlinger, 1973: 'A conjectural statement of the relation between variables.')

6 Characteristics of a GOOD Hypothesis (per IGNOU Block 1)

1. Conceptually Clear

Use precise terms; no vague language.

2. Testable

Can be empirically verified or rejected.

3. Related to Existing Theory

Grounded in prior research / knowledge.

4. Logical Unity & Comprehensive

Internally consistent and complete.

5. Capable of Verification

Stated in falsifiable form.

6. Operationisable

Variables can be measured with clear definitions.

NULL Hypothesis (H_0)

States: NO relationship / NO difference exists.

Symbol: H_0

Researcher tries to REJECT it.

Example:

H_0 : Coffee has NO effect on alertness.

(Mean alertness with coffee = without coffee)

If rejected → result is statistically significant.

ALTERNATIVE Hypothesis (H_1 / H_a)

States: There IS a relationship / difference.

Symbol: H_1 or H_a

What the researcher actually believes.

Example:

H_1 : Coffee improves alertness.

(Mean alertness with coffee > without coffee)

If H_0 is rejected → H_1 is supported.

Directional vs Non-Directional Alternative Hypothesis

	DIRECTIONAL (one-tailed)	NON-DIRECTIONAL (two-tailed)
Predicts	A specific DIRECTION of difference	Only THAT a difference exists, not direction
Key words	greater than, less than, increases, decreases	different, not equal, affects, related
Symbol	$\mu_1 > \mu_2$ or $\mu_1 < \mu_2$	$\mu_1 \neq \mu_2$
Example	'Exercise REDUCES anxiety.'	'Gender AFFECTS aggression.'
When to use	When prior research suggests a direction	When direction is unknown / exploratory

Memory hook:

Directional = you BET on a direction (one-tailed test).

Non-directional = you only say 'something will happen' (two-tailed test).

Type I and Type II Errors — The 2×2 Decision Matrix

	REALITY: H_0 is TRUE	REALITY: H_0 is FALSE
DECISION: Reject H_0	<p>TYPE I ERROR (α) FALSE POSITIVE Saying there IS an effect when there ISN'T.</p>	<p>CORRECT DECISION (Power of the test)</p>
DECISION: Accept (do not reject) H_0	<p>CORRECT DECISION ✓</p>	<p>TYPE II ERROR FALSE NEGATIVE Saying there ISN'T an effect when there IS.</p>

Memory hook: Type I = 'Crying WOLF' (false alarm). Type II = 'Missing the WOLF' (real threat ignored).

Sampling = the process of selecting a **SUBSET (sample)** from a larger group (**population**) to study.

POPULATION (N)

Everyone you're interested in.
e.g. ALL college students in India
(too many to study directly!)



SAMPLE (n)

A representative subset.
e.g. 500 students from 5 cities
(realistic to study)

Why NOT study everyone?

- Studying the whole population is too expensive.
- Takes too much time.
- Population is dynamic — births, deaths, migration.
- Sometimes destructive (e.g. drug side-effect testing).
- Often geographically scattered.

Term	Symbol / Notation	Meaning
Population	N	The whole group of interest
Sample	n	Subset selected from the population
Sampling Unit	—	Each individual / case in the sample
Sampling Frame	—	List of all members of the population (e.g. voter list)
Sampling Design	—	The PLAN / strategy for selecting the sample
Parameter	μ, σ	Numerical characteristic of the POPULATION
Statistic	\bar{X}, s	Numerical characteristic of the SAMPLE
Sampling Error	—	Difference between sample value and population value

Example: Population = 10 000 IGNOU MAPC students (N).

Sampling frame = IGNOU student database. Sample = 500 randomly chosen (n). Sampling unit = each student.

Aspect	PROBABILITY (Random)	NON-PROBABILITY (Non-Random)
Selection chance	Each unit has KNOWN, equal chance	Selection chance is UNKNOWN
Representativeness	Highly representative ✓	Less representative X
Sampling error	Can be ESTIMATED	Cannot be estimated
Cost & Time	Higher cost & time	Quick and cheap
Bias control	Free from selection bias	Subject to bias
When to use	Generalisation needed	Exploratory or hard-to-reach groups
Methods (per IGNOU)	SRS, Stratified, Cluster	Convenience, Quota, Purposive, Snowball, Systematic

IGNOU note: Systematic sampling is classified under NON-probability in Block 1.

1

1. Simple Random Sampling (SRS)

Every unit has an equal & known chance of selection.

How: list all members → use lottery / random number table.

e.g. Lucky-draw — every name in a box, pick blindly.

2

2. Stratified Random Sampling

Divide population into STRATA (homogeneous groups) → randomly sample from each.

How: first stratify (by age/gender/year) → then SRS in each.

e.g. 1000 students: 1st yr 400 → 40, 2nd yr 300 → 30, etc.

3

3. Cluster / Multi-stage Sampling

Population is divided into CLUSTERS (often geographic) → random clusters chosen → all/sample within.

How: random states → random districts → random schools → random students.

e.g. Good for nationwide studies; cheaper than SRS for wide geography.

Non-Probability Sampling Methods (5 types per IGNOU)

1. Convenience (Haphazard / Accidental)

Pick whoever is easiest to reach.

e.g. 'Person on the street' TV interview.

2. Quota

Fix CATEGORIES & numbers first → then pick conveniently.

e.g. 5 male / 5 female under 30; 10 male / 10 female 30-60.

3. Purposive (Judgmental)

Researcher's expert JUDGMENT picks specific cases.

e.g. interview only journalists & legislators on a national issue.

4. Snowball (Chain referral)

Start with a few contacts → they refer more → chain grows.

e.g. studying drug users / hidden populations.

5. Systematic

Pick EVERY Nth person from a list (after random start).

e.g. every 8th name from a telephone directory.

Aspect	PURPOSIVE	SNOWBALL
Selection logic	Researcher's expert JUDGMENT	Existing contacts REFER more contacts
Sample built by	Researcher chooses each unit	Sample grows by chain referral
When useful	When the relevant people are known & accessible	When the population is hidden, hard to find, or unknown
Example	Studying national policy → interview legislators, journalists, teachers	Studying drug users → one user introduces another
Other names	Judgmental sampling	Network / Chain-referral / Reputation sampling
Limitation	Heavy reliance on researcher's bias	Cumbersome with > 100; bias by initial contacts

Cost

LOWEST — cheaper than studying entire population.

Speed

Data collection is FASTER.

Accuracy

Smaller dataset → easier to ensure homogeneity & quality.

Practicality

Census often impossible (population too big or scattered).

Reliability

Modern sampling methods give acceptably accurate results.

Bias control

Random sampling = sampling error can be ESTIMATED.

**10-MARK Essay
(Section A)**

- Discuss steps in the research process.
- Define reliability. Discuss methods of estimating reliability.
- Define validity. Explain types of validity / threats.
- Discuss various sampling methods.
- Define variable. Discuss types of variables.
- What is hypothesis? Discuss its formulation.

**6-MARK Question
(Section B)**

- Differentiate reliability vs validity.
- Threats to internal / external validity.
- Variables vs Constructs.
- Types of constructs.
- Difficulties in formulating hypothesis.
- Type I vs Type II errors.
- Probability vs Non-probability sampling.

**3-MARK Short Note
(Section C)**

- Research biases.
- Active vs Attribute variables.
- Extraneous & Confounding variables.
- Convergent vs Discriminant validity.
- Snowball sampling.
- Concept vs Construct.
- Types of hypothesis.

Research

Re + Search = systematic, controlled, empirical investigation (Kerlinger).

7 Steps

Problem → Hypothesis → Variables → Design → Analysis → Conclusion → Report.

Reliability

= CONSISTENCY. Methods: TR, PF, SH, KR-20, $C\alpha$.

Validity

= ACCURACY. 6 types: Content, Criterion, Construct, Face, Internal, External.

Reliability vs Validity

Reliable BUT not Valid is possible. Valid → MUST be Reliable.

IV vs DV

I VARY (IV) → see DIFFERENCE (DV).

Confounding

An extraneous that ALREADY varied with the IV.

Constructs

Concept + special scientific use. Two types: Intervening, Hypothetical.

Hypothesis

H_0 = 'no difference' | H_1 = 'there is a difference.'

Type I error

Reject TRUE H_0 → false alarm (α).

Type II error

Accept FALSE H_0 → missed effect (β).

Sampling

Probability → SRS, Stratified, Cluster. Non-prob → Convenience, Quota, Purposive, Snowball, Systematic.

Thank You

Questions? Doubts? Practice Problems?

Master these 4 units → you'll comfortably handle any MPC-005 paper.

Remember: R + V + V + H + S

Research basics + Reliability/Validity + Variables + Hypothesis + Sampling