PSYC10004 Mind, Brain and Behaviour 2

SCHOOL OF PSYCHOLOGICAL SCIENCES · THE UNIVERSITY OF MELBOURNE · UNDERGRADUATE LEVEL 1

Full guide + ask Sia about PSYC10004

SIDE 1/2 EXAM REVISION SHEET · DEFINITIONS → DECISIONS → BOUNDED CONCLUSIONS

FINAL EXAMINATION · 55% · 120 MCQ

S2 2026 · **What the final rewards**

0 · Exam Map

COURSE DATA · BRIEF

Lab Report 40% | Final Examination 55% | 5%

Lab Report 40% · Final Examination 55% · Research Experience Program 5%

Permitted materials: not confirmed for this offering in the course materials we hold — check the exam instructions on the LMS.

FINAL FORMAT	OPERATION
Up to 3 h; 120 MCQ; all 5 topic areas	On campus; invigilated; Canvas quiz with Respondus LockDown Browser

★ **Highest-transfer move:** research question → operational definition → defensible design → correct analysis → qualified conclusion. Keep construct validity, statistical inference and causal inference separate.

0A · Assessment Controls

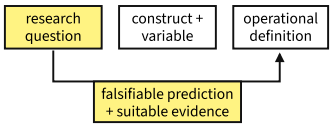
COURSE DATA

REQUIREMENT	SOURCE-GROUNDED CONTROL
Assessment Literacy Module	Must be completed.
Practical attendance	At least 80%, operationalised as 9 of 11 classes.
Completion wording	Captured assessment material is internally inconsistent about whether every marked task must also be completed; confirm the separate rule in the current course site.

SOURCE RULE → *Do not convert either side of the captured contradiction into a categorical completion rule.*

1 · Question → Evidence

C1 · C6



Redrawn from the guide: name the object, make it measurable, then state what evidence could change the claim.

TERM	EXACT JOB
Research question	Focuses population, variables or phenomenon and the relationship investigated.
Construct	Abstract psychological idea.
Variable	Measurable or manipulable representation.
Operational definition	Procedure used to manipulate, observe or quantify the construct in this study.

MCQ BOUNDARY

An operational definition makes a construct testable; it does not exhaust every meaning of that construct.

2 · Design, Variables, Ethics

C7

Independent variable = manipulated or used as a predictor. *Dependent variable* = measured outcome. *Experimental control* holds alternatives constant or distributes them across conditions so the target effect can be isolated.

IV / predictor starting condition	DV / outcome what is measured
control test alternatives	ethics autonomy · welfare privacy · fairness

Guide comparison: a design must answer the question and protect participants while exposing confounds.

CHECK	WHAT A DEFENSIBLE OPTION SHOWS
Design fit	The sampling structure and variables match the question.
Control	A plausible alternative is held constant, distributed or measured.
Ethics	Autonomy, welfare, privacy, fairness and integrity from recruitment through reporting.
Boundary	Confounds, measurement and bias still qualify interpretation.

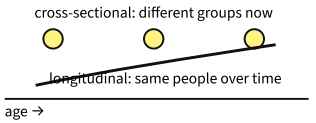
RULE WHERE IT BITES

Ethical approval does not remove the need to evaluate measurement, bias and interpretive limits.

FAILURE PATH → *A design can protect participants yet still fail to isolate the target relation; ethics, control and measurement each need their own evidence.*

3 · Developmental Designs

C3



Research design by age: distinguish observed age differences from within-person developmental change.

EVIDENCE	CAN SUPPORT	CANNOT ESTABLISH ALONE
Cross-sectional age difference	Groups of different ages differ at measurement.	That the same individuals changed over time.
Longitudinal comparison	Change or continuity in linked people.	Freedom from measurement, sampling or context limits.

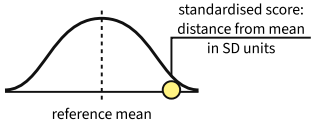
Cohort and context are historical, social and environmental conditions shared by a group that can be mistaken for effects of age. The correct conclusion names which explanation the design can separate and which remains plausible.

TRAP → *"Older group scored differently" is a group contrast, not direct evidence of individual development.*

4 · Distributions & Position

C8

Centre and variability describe typical location and how observations differ. *Distribution shape* includes symmetry, skew, modality, gaps and unusually extreme observations. Report all three jobs: where, how spread, what shape.



Guide route: centre + variability + shape → locate an observation relative to its mean and standard deviation.

CUE	INTERPRETATION
Positive standardised score	Observation lies above the reference mean.
Negative standardised score	Observation lies below the reference mean.
Larger absolute distance	Farther from the reference mean in SD units.
Change reference distribution	Relative position can change because the mean/SD context changed.

MCQ BOUNDARY

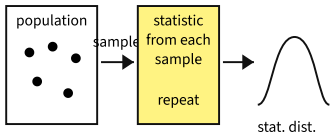
A z-score reports relative position within the specified distribution; it is not a probability by itself.

DESCRIBE BEFORE LOCATING → *Centre without variability hides spread; a standardised position without its reference distribution is incomplete.*

5 · Samples & Standard Error

C9

Probability model assigns probabilities to possible outcomes under stated assumptions. A *random sample* uses a chance mechanism giving population members known opportunities to be included.



Sampling distribution = distribution of repeated statistics, not the spread of individual observations.

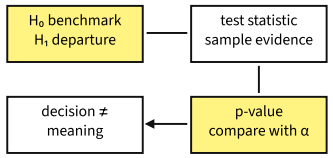
STANDARD ERROR

Estimated SD of a statistic's sampling distribution = expected sample-to-sample variation. Connect sample size + population variability to stability; do not substitute the raw-score spread.

WHICH IS TRUE? → *"A wider sampling distribution means the statistic varies more across repeated samples" fits the definition; "individual scores are more dispersed" answers a different question.*

6 · NHST: Four Separate Jobs

C10



Redrawn from the guide: hypotheses → statistic → p-value/decision → substantive conclusion.

OBJECT	DEFINITION / DECISION JOB
H_0 / H_1	Competing statistical claims: benchmark effect versus departure.
Test statistic	Sample-based quantity standardised under the null model.
p-value	Extremeness under H_0; compared with a pre-specified significance level.
Conclusion	States what the result supports, with direction, magnitude, uncertainty and design boundary.

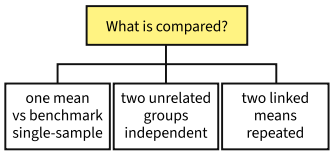
CLASSIC FALSE OPTIONS

p is not the probability H_0 is true. p is not an effect size. A statistical decision is not automatically a substantive or causal conclusion.

Make the exact task visible before detail: state hypotheses, calculate or read the result, compare p with the decision rule, then interpret without crossing measurement or design limits.

7 · T-Test Classifier

C11 · C12



sampling structure chooses the test

Decision rule: benchmark, unrelated groups, or linked observations—not the topic's wording—selects the comparison.

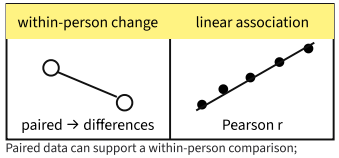
TEST	REQUIRED STRUCTURE	UNCERTAINTY OBJECT
Single-sample	One sample mean vs specified benchmark; population variance unknown.	Observed mean relative to benchmark.
Independent-samples	Different, unrelated participants/units.	Standard error of the difference.
Repeated-measures	Same participants or meaningfully matched observations.	Difference scores preserve dependence.

WITHDRAWAL RULE

Independent-samples logic requires separate observations; it does not fit repeated measurements of the same participants.

8 · Repeated Measures vs r

C12



Paired data can support a within-person comparison; correlation answers whether two quantitative variables vary linearly together.

FEATURE	REPEATED COMPARISON	PEARSON CORRELATION
Object	Two related means.	Two quantitative variables.
Core quantity	Each unit's difference score.	Standardised direction/strength of linear relationship.
Question	Did linked measurements differ?	Do values move together linearly?
Boundary	Dependence must be preserved.	No causal direction; third variables remain.

Paired observations are linked within the same person, matched pair or unit. *Difference scores* subtract one paired measurement from the other for each linked unit. In JASP, first identify the analysis family; then extract the result that answers that family's question.

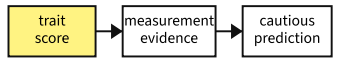
WHICH-IS-TRUE CONTRAST

A strong correlation can coexist with little mean change; a mean change can coexist with a weak correlation. Association is not comparison.

9 · Measurement Validity

C5

Trait description summarises relatively stable recurring patterns in thoughts, feelings and behaviour. *Person–situation consistency* asks how similar or different characteristic behaviour remains across settings. *Measurement validity* asks whether evidence supports interpreting the score as the intended construct.



situation limits every arrow

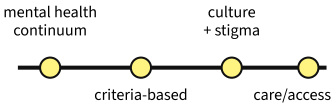
Trait evidence supports bounded prediction only after measurement and situation checks.

BOUNDARY

A trait score is an estimate from a measure, not a complete or immutable account of the person.

10 · Clinical Classification

C2



Redrawn source path: continuum and classification answer different questions; culture and stigma can alter consequences.

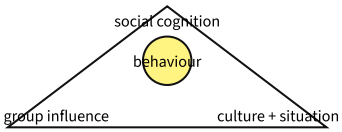
LENS	WHAT IT CONTRIBUTES	LIMIT
Mental health continuum	Degrees of wellbeing, distress and functioning rather than a healthy–ill binary.	Position on a continuum is not itself a diagnosis.
Diagnostic classification	Criteria-based grouping supports communication, research and clinical decisions.	Does not itself explain cause or define a person.
Culture + stigma	Social meanings shape interpretation, disclosure and treatment across communities.	One context cannot be assumed for all people.

MCQ DISCRIMINATOR

Classification may organise care while also shaping identity, access and stigma. Reject any option that turns a label into cause, essence or whole person.

11 · Social Explanation

C4



Person–situation explanation: social cognition, group influence and context jointly constrain the claim.

Social cognition covers how people perceive, interpret, remember and judge social information. *Group influence* covers changes in judgement or behaviour produced by norms, conformity, roles, authority or interaction. *Culture and situation* alter how events are interpreted and answered.

WEAK OPTION	BETTER ANSWER
Names a motive from a group pattern.	States the narrow behaviour pattern, a person–situation mechanism and a plausible alternative.
Assigns the average to every member.	Preserves individual variation and tests whether context changes the pattern.

BOUNDARY

One group-level pattern cannot be assigned to every member or treated as proof of an individual motive.

12 · Answer Skeleton

C13

1. Define the construct/category and name the evidence or sampling structure.

Check your exam instructions on the LMS for what you may bring; use this sheet to revise and self-test.

AskSia

FORWARD THIS TO YOUR TUTORIAL GROUP · SHARED BY _____

asksia.ai/cheatsheet/unimelb-psyc10004

v2 · 2026-10-25 · Semester 2 examination period, 2–20 November 2026.

PSYC10004 Mind, Brain and Behaviour 2

SELF-TEST DRILLS · ANSWER PATHS · JUDGEMENT CARDS · CLASSIC TRAPS

Full guide + ask Sia about PSYC10004

SIDE 2/2 RETRIEVE → TRANSFER → COUNTER-CASE → REVISE

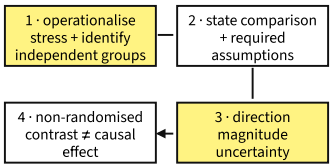
COVER ANSWERS · SAY THE PATH ALOUD

S2 2026 · **Drills for the last week**

13 · Worked 1: Stress Groups

COURSE WORKED EXAMPLE · 4 MARKS

Prompt: A class compares stress scores for two independent groups. Draft the four moves that turn the question into a reportable result without claiming causation.



Answer path from the source example; every move has a separate inference job.

MODEL PATH

```
Define the measured construct → use an independent-samples comparison → interpret the observed difference with uncertainty → state that a non-randomised group contrast cannot by itself identify a causal effect.
```

IF THE OPTION...	VERDICT
Names "stress" but not how measured	Construct named; operational definition missing.
Uses paired logic for unrelated groups	Wrong sampling structure.
Reports significance without direction or limitation	Decision present; meaning incomplete.
Claims the group membership caused stress	Crosses the design boundary.

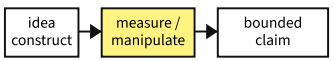
SAY ALOUD → *"The result answers the measured comparison, under its assumptions; it does not automatically validate the construct or identify causation."*

One mark belongs to each move in the source path. Do not spend all four moves restating the group difference: definition, test choice, interpretation and boundary are separately checkable.

14 · Construct Judgement Cards

C6 · C7

If you see an abstract idea → ask how it was measured/manipulated. If you see a measure → ask what construct interpretation its validity evidence supports. If you see "effect" → ask whether alternatives were controlled. If you see ethical approval → still inspect measurement, bias and interpretation.



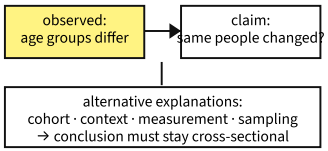
validity evidence controls the last arrow

Fast filter: familiarity of the construct name never substitutes for operational or validity evidence.

15 · Worked 2: Age Difference

C3 WORKED EXAMPLE · 4 MARKS

Prompt: A cross-sectional comparison finds an age-group difference. Does that demonstrate developmental change in the same individuals?



The discriminator is cohort/context: the observation and the developmental claim are not equivalent.

1. Define ***developmental change***: systematic change or continuity across the lifespan.
2. Identify ***research design by age***: cross-sectional, longitudinal or sequential.
3. Ask whether the same people were followed; if not, age and cohort are entangled.
4. Conclude only that groups differed at measurement; name cohort, measurement and sampling alternatives.

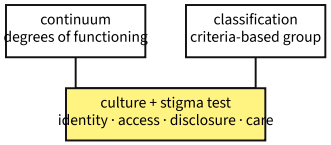
ANSWER

```
No. A cross-sectional age difference is not direct evidence that the same individuals changed over time.
```

16 · Worked 3: Diagnosis & Context

C2 WORKED EXAMPLE · 4 MARKS

Prompt: A draft treats the mental health continuum and diagnostic classification as equivalent. Repair it using culture and stigma as a discriminator.



Separate the categories first; then apply the same context evidence to support, narrow or reverse the initial interpretation.

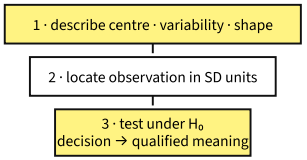
REPAIR MOVE	ANSWER PATH
1 · Compare	State exactly how continuum and classification differ.
2 · Evidence	Place the observation under the correct lens.
3 · Discriminate	Use culture/stigma to test access, meaning, disclosure or treatment.
4 · Bound	A label classifies by criteria; it does not explain cause or define a person.

TRAP → *"Meets criteria, therefore the label explains why" converts classification into an unsupported causal account.*

17 · Worked 4: Statistic → Decision

C8 · C10 WORKED PATHS

Prompt: An observation is described relative to a distribution, then a test result is used to make a statistical decision. Which statements remain valid?



Do not collapse descriptive position, statistical decision and psychological meaning into one claim.

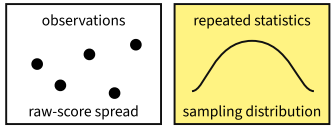
STATEMENT	VERDICT
"The z-score gives relative position in this distribution."	True by definition.
"The z-score is the probability of observing the score."	False: relative position ≠ probability.
"The p-value measures extremeness under H_0."	True under the stated model.
"The p-value is the probability H_0 is true."	False.
"A decision also proves practical importance or causation."	False: effect meaning and design boundary are separate.

FOUR-SENTENCE SHORT-ANSWER FRAME

```
H0/H1 → statistic/result → p versus pre-specified level → conclusion in context, including direction, magnitude, uncertainty and design limit.
```

18 · Sampling Traps

C9



Two spreads, two denominators: individuals in one sample versus a statistic across possible samples.

If you see "across repeated samples" → sampling distribution / standard error. If you see "individual observations in one sample" → distribution variability. If you see "chance mechanism with known opportunities" → random sample. If an option promises certainty from one statistic → reject; report expected sample-to-sample variation.

COUNTER-CASE → *A representative-looking sample does not prove every possible sample would give the same statistic.*

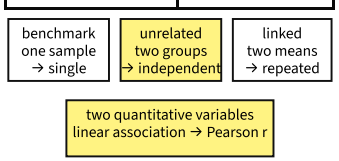
When two options mention "spread", locate the noun being spread: **observations** belong to the data distribution; **statistics** belong to the sampling distribution.

19 · Test-Choice Sprint

C11 · C12

Cover the right column. Classify by sampling structure first; only then read the requested result.

STEM CUE	CHOOSE / REJECT
One sample mean versus a specified benchmark; population variance unknown	**Single-sample t-test.**
Two groups of different, unrelated participants	**Independent-samples t-test.** Interpret difference and uncertainty.
Same participants measured twice	**Repeated-measures t-test.** Form and analyse linked difference scores.
Matched observational units	**Repeated-measures logic.** Preserve pairing.
Direction and strength of a linear relationship between two quantitative variables	**Pearson correlation.**
Repeated measurements analysed as unrelated groups	**Reject:** dependence discarded.
Association used to claim causal direction	**Reject:** third-variable and direction explanations remain.



Fast sorting visual redrawn from the guide's comparison figures.

JASP EXTRACTION ORDER

```
Analysis family → variables/structure → direction and magnitude → uncertainty/decision → bounded interpretation.
```

SPEED RULE → *Read the relationship between observations before reading the test name; the participant structure is the discriminator.*

20 · Worked 5: Correlation Audit

C12 WORKED EXAMPLE · 4 MARKS

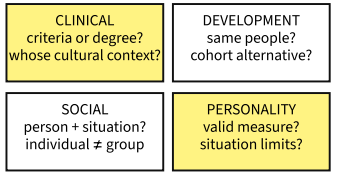
Prompt: A draft calls paired observations, difference scores and Pearson correlation equivalent. Repair it.

1. State whether the task asks about *within-person difference* or *association*.
2. For a comparison, preserve pairing and calculate each linked unit's difference score.
3. For association, use Pearson correlation to describe linear direction and strength.
4. State the limit: correlation does not establish causal direction or remove third-variable explanations.

21 · Substantive Contrast Grid

C2–C5

PROMPT	CORRECT CONTRAST	CLASSIC OVERCLAIM
Clinical	Continuum (degrees) ≠ classification (criteria); culture/stigma alter meaning, disclosure, access and treatment.	Label explains cause or defines the person.
Development	Age-group difference ≠ within-person change; test cohort/context, measurement and sampling.	Cross-sectional difference proves development.
Social	Person cognition + group influence + culture/situation; test a plausible alternative.	Group pattern proves each member's motive.
Personality	Trait score + person–situation consistency + measurement validity.	Score is complete, immutable identity.

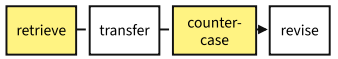


Before choosing an option, identify the chapter's discriminator and the claim it forbids.

22 · Which-Is-True Traps

ALL STRANDS

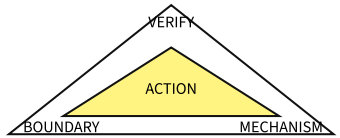
FALSE SHORTCUT	TRUE REPLACEMENT
Operational definition = the whole construct	It is the study-specific procedure making the construct testable.
Ethics approval = unbiased design	Ethics and validity are both necessary checks with different jobs.
Sampling distribution = raw-score distribution	It describes repeated statistics.
p-value = effect size or P(H_0 true)	It is extremeness under H_0, conditional on the model.
Independent groups can contain repeated measures	Independent observations come from separate units.
Correlation establishes causation	It describes linear association only.
Trait score fixes behaviour across settings	Prediction is bounded by situation and measurement validity.



Source practice cycle: do not reread; retrieve, change the case, test the boundary, repair the first failed move.

23 · Exam-Morning Plan

C13 · COURSE STRATEGY



Final control: verify the object, state the mechanism, preserve the boundary, then choose the action.

PASS 1 · FIVE TOPIC STRANDS

STRAND	RECITE WITHOUT NOTES
Clinical	Continuum / classification / culture-stigma / label boundary.
Developmental	Design by age / cohort-context / cross-sectional limit.
Social	Cognition / group influence / culture-situation / level-of-analysis limit.
Personality	Trait / person-situation / validity / score boundary.
Methods	Question → operation → design → distribution → inference → qualified conclusion.

PASS 2 · TEST SELECTION

Say the sampling cue before the test: benchmark → single; unrelated groups → independent; linked means → repeated; linear association → Pearson r. Then name direction, magnitude, uncertainty and the design boundary.

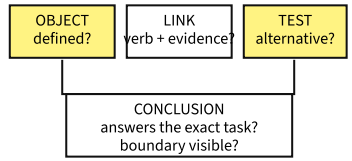
PASS 3 · TRAP SWEEP

Reject: label = cause; age difference = individual change; group mean = every member; trait = immutable identity; z = probability; sampling distribution = raw spread; p = P(H_0); association = causation.

CONTROL → *Stop revising an answer only when you can define the terms, apply them to a changed case and state the first condition that would change the conclusion.*

24 · Fast Answer Audit

C13



A complete response assigns separate jobs to object, mechanism, discriminator and limit.

1. **Object:** What is being analysed—construct, population, comparison or statistic?
2. **Evidence:** Which observation, sampling structure or output bears on it?
3. **Link:** What changes what? Use a verb, not a list of terms.
4. **Counter-case:** What plausible alternative or failed assumption changes the choice?

Check your exam instructions on the LMS for what you may bring; use this sheet to revise and self-test.

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