CAMBRIDGE
International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/21**

Paper 2 Research methods **May/June 2025**

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Social Science-Specific Marking Principles
(for point-based marking)

1 Components using point-based marking:

- Point marking is often used to reward knowledge, understanding and application of skills. We give credit where the candidate's answer shows relevant knowledge, understanding and application of skills in answering the question. We do not give credit where the answer shows confusion.

From this it follows that we:

a DO credit answers which are worded differently from the mark scheme if they clearly convey the same meaning (unless the mark scheme requires a specific term)
b DO credit alternative answers/examples which are not written in the mark scheme if they are correct
c DO credit answers where candidates give more than one correct answer in one prompt/numbered/scaffolded space where extended writing is required rather than list-type answers. For example, questions that require *n* reasons (e.g. State two reasons …).
d DO NOT credit answers simply for using a 'key term' unless that is all that is required. (Check for evidence it is understood and not used wrongly.)
e DO NOT credit answers which are obviously self-contradicting or trying to cover all possibilities
f DO NOT give further credit for what is effectively repetition of a correct point already credited unless the language itself is being tested. This applies equally to 'mirror statements' (i.e. polluted/not polluted).
g DO NOT require spellings to be correct, unless this is part of the test. However spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. Corrasion/Corrosion)

2 Presentation of mark scheme:

- Slashes (/) or the word 'or' separate alternative ways of making the same point.
- Semi colons (;) bullet points (•) or figures in brackets (1) separate different points.
- Content in the answer column in brackets is for examiner information/context to clarify the marking but is not required to earn the mark (except Accounting syllabuses where they indicate negative numbers).

3 Calculation questions:

- The mark scheme will show the steps in the most likely correct method(s), the mark for each step, the correct answer(s) and the mark for each answer
- If working/explanation is considered essential for full credit, this will be indicated in the question paper and in the mark scheme. In all other instances, the correct answer to a calculation should be given full credit, even if no supporting working is shown.
- Where the candidate uses a valid method which is not covered by the mark scheme, award equivalent marks for reaching equivalent stages.
- Where an answer makes use of a candidate's own incorrect figure from previous working, the 'own figure rule' applies: full marks will be given if a correct and complete method is used. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.

4 Annotation:

- For point marking, ticks can be used to indicate correct answers and crosses can be used to indicate wrong answers. There is no direct relationship between ticks and marks. Ticks have no defined meaning for levels of response marking.
- For levels of response marking, the level awarded should be annotated on the script.
- Other annotations will be used by examiners as agreed during standardisation, and the meaning will be understood by all examiners who marked that paper.

Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Correct point
	Incorrect point
BOD	Benefit of doubt
REP	Repetition (of stem or within response)
	Unclear point
GM	Generic mark
L1 L2 L3 L4 L5	Used to show Level 1, 2, 3, 4, or 5 in the 10-mark planning Q
NAQ	Not answering question

Annotation	Meaning
SEEN	Acknowledge blank pages
^	Something is missing
a b c d	Used for each point of description of a required feature in the 10-mark planning Q

Important marking guidelines for reference
Parts of the mark scheme include instructions for marking answers to modified braille questions. These instructions are in blue and are for the Principal Examiner and Team Leaders **only**. Do **not** use the braille instructions to mark standard responses.

Question	Answer	Marks	Guidance
1(a)	**Describe what is meant by a questionnaire.** Description = 1 Detail = 1 • Self-report / questions; • Written/ on paper / online; • Written questions = 2	**2**	
1(b)	**Explain <u>one</u> practical strength of using a questionnaire.** Explanation = 1 Detail / comparison = 1 • unlikely to lie / low risk of social desirability/more likely to be honest: (explanation) • **because** not face to face / no researcher present / fill in alone: (detail) • Wider sample as can be posted/online (explanation) • which means that it will be more representative/generalisable (detail)	**2**	**Accept** fewer demand characteristics Ethical advantages = 0

Question	Answer	Marks	Guidance
2(a)	**The study by Bandura et al. (aggression) provides no information about whether or not consent was obtained from the participants** **Outline what is meant by 'consent'.** Outline = 1 Consent = agreeing to take part in a study	**1**	Answer does not require informed consent but it is correct
2(b)	**Suggest why obtaining consent would have been important <u>in this study.</u>** **Linked suggestion** = 1 **Detail** or **second** linked suggestion = 1 • The children could have been made (permanently) more aggressive; i.e. needs learn/imitate • The children could have been hurt; • The parents might not have wanted the children to **learn** aggression;	**2**	The children / parents had a choice = 0 [**not linked**] The children / parents might not have wanted to participate = 0 [**NAQ/not linked**]

Question	Answer	Marks	Guidance
3(a)	**In the study by Milgram, obedience was tested. Participants with a range of different occupations and ages were used to improve generalisability.** **Suggest <u>one</u> reason why using participants with different occupations could be important to Milgram's test of obedience. Use an example in your answer.** Linked suggestion = 1 Example = 1 **Suggestion (linked to obedience)** • because some occupations expect employees to be <u>more obedient/are more likely to be</u> <u>obedient</u> than other (linked suggestion) = 1 • As there may be a difference in levels of obedience dependent on occupation = 1 **<u>Examples</u>** • For example, managers / the police expect obedience from others; (example) • For example, workers must be (more) obedient to their employers; (example)	**2**	Generalisability = 0 as repeating the question

Question	Answer	Marks	Guidance
3(b)	**Suggest <u>one</u> reason why using participants with different ages could be important to Milgram's test of obedience. Use an example in your answer.** Linked suggestion = 1 Example = 1 These two elements **must** be separate. **<u>Linked Suggestion</u>** • younger people are expected to be more/less obedient (than older people); • *That different ages would have different levels of obedience* **<u>Examples</u>** • Parents / teachers expect children to obey; (example) • Older children give orders to younger children; (example)	**2**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>4(a)</td><td>In the study by Baron-Cohen et al. (eyes test), the ages of all participants were known. The mean and standard deviation of the ages of participants in Groups 1 and 3 are shown in Table 4.1.

<table>
<tr><td>Group</td><td>Mean</td><td>Standard deviation</td></tr>
<tr><td>Group 1 (AS/HFA adults)</td><td>29.7</td><td>14.5</td></tr>
<tr><td>Group 3 (Students)</td><td>20.8</td><td>0.8</td></tr>
</table>

State what the means show about the ages of the two groups.

Explanation = 1
• That the AS-HFA / Group 1 were older (than the Students/Group 3); ORA</td><td>1</td><td>The mean of the AS/HFA group (1) was bigger = 0 [NAQ]</td></tr>
<tr><td>4(b)</td><td>State what the standard deviations show about the ages of the two groups.

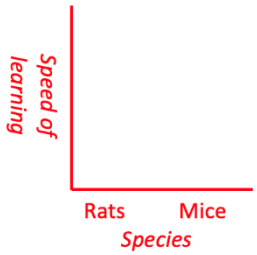
Explanation = 1
• The AS-HFA/ Group 1 ages were more spread out (than the students/3); ORA
• Larger range of ages in group 1 than group 3</td><td>1</td><td>Greater deviation / deviated more = 0 [REP]
The standard deviation of the AS/HFA group was bigger = 0 [NAQ]</td></tr>
</table>

Question	Answer	Marks	Guidance
5	**Explain <u>one</u> ethical weakness of the case study research method. Do <u>not</u> use consent in your answer.** Identification of ethical weakness = 1 Detail = 1 • The participant might find it difficult to **withdraw**; (weakness) • because they have built up a relationship with the researcher; (detail) • There may be an invasion of **privacy**; (weakness) • the researcher cannot know in advance what they will ask/find; (detail) • **Confidentiality** may be at risk; (weakness) • because details about the P may make them identifiable; (detail) • **Distress** might be caused by the intensity; (weakness) • e.g. the depth of enquiry might bring up trauma; (detail) • e.g. Saavedra & Silverman were studying fear; (detail)	**2**	

Question	Answer	Marks	Guidance
6	**Describe opportunity sampling and random sampling, using any example(s).** 1 mark for each definition/point of detail, up to a maximum of 2 for each term/concept. 1 mark for each example, max 2 for each term/concept. Examples can include examples from any studies (core studies, other studies, candidate's own studies). Max 4 if no examples or if only about one term/concept. Only 1 example needed to access 6 marks. **Definition of 'sampling technique'=1 MAX** ***Opportunity sampling:*** • Using participants who are **available at the time**; (description) • Passers-by/students in the researcher's class; (detail) • **Baron-Cohen et al**. found participants in adult community education class (in Exeter)/(public) library (in Cambridge); (detail) • **Saavedra & Silverman** child (& mother) in treatment (at Florida International University); (detail) • **Piliavin et al.** subway passengers; (detail) ***Random sampling:*** • Each individual in the population has an equal chance of being selected; • getting a numbered list of people/your target population (1) and putting the numbers in a hat and drawing the number required / using a random number generator **to select the sample size required; (1) (= 2 for detailed example here)** • a study might use the list of all students in a school and select 30 from them **(=1 for brief example)**	**6**	**No** marks for **evaluation** e.g. more /less representative **No** marks for **Bandura et al, Holzel et al., Perry** et al. as no information on sampling in the original paper. **Pozzulo** – adults volunteered for pool but not known if there were opportunity or volunteer for sample, nor about child participants.

Question	Answer	Marks	Guidance
6	**Other examples** • **Andrade** – accept opportunity as although they had originally volunteered for a different study, they were recruited by opportunity after leaving it. • **Dement & Kleitman** accept opportunity. • **Baron-Cohen** used random sampling (allegedly) = 1 mark		
7(a)(i)	**Dr Smith wants to compare how easily two species of animal learn to press a lever to receive food.** **Suggest one way that Dr Smith could produce a quantitative measure of how easily the animals learn.** Identification of way = 1 Detail = 1 Accept any reasonable measure of **ease/speed** of learning Learning can be operant or classical conditioning or social learning • Skinner **box**; (way) =1 • **Time** how long before they press the lever / get food; (way or detail) =1 • **Count** the number of lever presses / get food; (way or detail) =1 • The **quicker** the pressing of the lever achieves food the **quicker they learn;** (detail) =1 • Time how long before they press a lever/get food (way); the quicker they press the lever/get food the quicker they learn =2	**2**	**Count** number of bar presses; in a **Skinner box**; = 2

Question	Answer	Marks	Guidance
7(a)(ii)	**The two species are very similar, but one is bigger than the other.** **For the way that you suggested for measuring how easily the animals learn in part (a)(i):** **Explain whether this would be valid for both species.** Explanation (of why valid *or* invalid) = 1 Detail = 1 ***Valid because**:* • Both can operate the lever; (explanation) • As they are similar /both probably have paws; (detail) • The learning task would be equally easy; (explanation) • The task is measuring cognitive abilities to learn and not size so not relevant (explanation) ***Not valid because:*** • One is bigger so could reach the lever easily/more quickly; (explanation) • So they would look like they learned more easily; ORA (detail) • A bigger animal (with bigger paws) may struggle to press a small lever properly (explanation) • So they would struggle to get the food even when trying to press the lever (detail)	**2**	

Question	Answer	Marks	Guidance
7(b)	**Draw the axes for a graph that could be used to show the results of Dr Smith's study using the measure of learning that you suggested in part (a)(i). You must label the axes.**  For full marks **must** have 1 mark for x-axis label **and** 1 mark for y-axis label [i.e. x and y units but only 1 label = 2 marks max, not 3] ***x*-axis label**: '*Species'*; *x*-axis units: *two named species/ species 1 and 2;* ***y*-axis label**: *'Ease of learning' (e.g. speed, number correct);* y-axis units: numbers; **For PE and TLs only:** For the braille paper the question is: **Describe the axes for a graph that could be used to show the results of Dr Smith's study using the measure of learning that you suggested in part (a)(i). You must include the labels for the axes.**	**3**	

Question	Answer	Marks	Guidance
7(b)	Marks are allocated: 1 mark for label for x axis 1 mark for label for y axis 1 mark for either x axis units (two named species/species 1 and 2) OR Y axis units (numbers)		Use BOD when marking this Q on a braille script.
7(c)	**Suggest how Dr Smith could follow <u>one</u> ethical guideline in relation to animals, other than 'species'.** Identification of animal guideline = 1 (does not need to be defined) Link = 1 • Distress; (guideline) • Make sure the animals are not **frightened in the Skinner box**; (link) • Housing; (guideline) • **Rats and mice are social**, they should not be housed alone; (link) • Deprivation; (guideline) • They must not be hungry just to make them **learn**; (link)	**2**	

Question	Answer	Marks	Guidance
8(a)(i)	**Josie is collecting data from other students in her class to test the hypothesis 'There is a relationship between tidiness of classwork and enjoyment of lessons'.** **Josie will use one of these measures of tidiness:** • **look at the work herself and decide whether each student's work is tidy or not** • **ask the student to rate the tidiness of their work on a scale of 0 (untidy) to 5 (very tidy).** **Explain <u>one</u> problem about validity or reliability that Josie could have with <u>one</u> of her measures of tidiness.** Linked problem = 1 Correct link to validity OR reliability = 1 ***Josie looks:*** • The student may have a system of working that Josie does not understand (like putting newest notes at the front, but Josie expects them at back), so thinks work is untidy; (linked problem) • This is a problem of **validity**; (correct validity) ***Students rate:*** • Different students might interpret the numbers differently, e.g. '3' for one student might be much tidier than for another; (linked problem) • This is a problem of **reliability**; (correct reliability) • validity is limited because only 2-point data if Josie rates so doesn't discriminate between different levels of tidiness = 2	**2**	

Question	Answer	Marks	Guidance
8(a)(ii)	**Explain <u>one</u> problem about ethics that Josie could have with <u>one</u> of her measures of tidiness.** Linked problem = 1 Correct link to guideline = 1 Looking at their work might be embarrassing; (linked problem) (Intrusion into) **privacy** / **harm** / **distress**; (correct guideline/issue)	**2**	
8(b)	**The hypothesis that Josie is testing is correlational. Explain which <u>one</u> of the measures of tidiness in part <u>(a)</u> is <u>not</u> suitable for Josie to use in her correlation.** No mark for selection of measure (e.g. 'look at the work herself) Explanation = 1 Link = 1 • Only **continuous** / **scale** / **linear** data can be correlated; (explanation) • Because it contains only nominal data / discrete / the data needs to be at least ordinal; (explanation) • And **tidy or not tidy is not** continuous / is only in categories; (link)	**2**	Being **quantitative** (or qualitative) is irrelevant = 0 [**NAQ**]

Question	Answer	Marks	Guidance
8(c)(i)	**Josie's data shows that students who enjoy lessons more have tidier work.** **Explain what Josie will conclude about her correlation.** Explanation first mark Link second mark Positive (correlation); (explanation) As both variables go up together; (explanation) When tidiness increases/is more, lesson enjoyment increases/is more; (link) ORA	**2**	Causal relationships = 0 e.g. One variable **causes** the other one increase = **0** e.g. Having a tidy work **makes** students enjoy lessons more = **0**
8(c)(ii)	**Explain whether Josie can conclude that having tidier classwork influences students' enjoyment of lessons.** Explanation = 1 Detail (generic or linked) = 1 **Explanation** • No, a correlation does not mean causation; **(explanation)** • No, correlations do not test for causal effects; **(explanation)** **Detail** • She would not know which of the two variables was the cause; **(detail)** • A third factor could be causing the correlation; (**detail)** **Linked detail** • (Tidiness and enjoyment) could be due to parents; **(linked detail)** • The tidy work might make students get better grades or students who get better grades might happen to keep their files tidy; **(linked detail)**	**2**	

Question	Answer	Marks	Guidance
9(a)(i)	**Dr Gao is planning a longitudinal study about changes in reading habits. She will study the same group of participants from childhood, through adolescence and into adulthood.** **Dr Gao will need to contact her participants at regular intervals.** **Dr Gao is deciding how often to test her participants, and is considering:** • **weekly** • **yearly.** **Explain which of these intervals is the most suitable for Dr Gao's study.** Explanation of yearly = 1 • Children's reading does not change fast enough to be visible over a week; • Changes in reading ability are slow, so could take a year to show • testing children every week would be unkind/intense/a lot of pressure/stressful.	**1**	•
9(a)(ii)	**Suggest how Dr Gao could contact her participants during the study.** Suggesting how to recontact = 1 Send **letter/email** (to address collected at the start of study); **phone** (with number collected as start of study);	**1**	

Question	Answer	Marks	Guidance
9(a)(iii)	**Suggest <u>two</u> problems that Dr Gao may have when trying to contact her participants at regular intervals.** Problem = 1 ×**2** • They might not reply; • They may have changed address/phone number; • They may have died/become too ill to participate; • They may no longer want to participate; • They may not be available (at that time for a call); • They may have gone on holiday so cannot reply; • They may have withdrawn	**2**	

Question	Answer	Marks	Guidance
9(b)	**A colleague, Dr Roberts, says that the study could be conducted by comparing participants of different ages at one point in time.** **Suggest <u>one</u> advantage of Dr Robert's idea compared to Dr Gao's plan for a longitudinal study.** **Do <u>not</u> refer to contacting participants in your answer.** Advantage of Dr Roberts' idea/disadvantage of longitudinal = 1 Link = 1 **Advantage (or disadvantage of longitudinal)** • Differences may be due to society not age/ (disadvantage) • Dr Roberts' idea would mean that you do not have a third variable of culture/societal changes which may affect reading habits (advantage) • You would be less likely to have participants drop out (subject attrition) when doing the study at one-point int time (advantage) **Link** • Time available for reading changes with society; (link) • People now have less time for reading than they did; (link) • People read more on the internet now rather than books; (link) • Reading materials change over time; (link) • The results more representative of reading habits than a longitudinal study (where people have dropped out) (link)	**2**	References to changes in reading over the lifespan = 0 [**NAQ**] Children read comics but adults read newspapers = 0 [**NAQ**]

10(a)	**Dr Miller is researching factors that affect how well people sleep. He wants to know whether creative activities (such as art, music or dance) help people to sleep well.** **Describe how Dr Miller could conduct an experiment using an independent measures design to investigate whether creative activities help people to sleep well.** **Do <u>not</u> describe sample/sampling technique or ethical issues/guidelines in your answer.** To mark Q10a, create four 'imaginary columns' down one margin, using one column for each of the four required features. Tick each feature (**tick-a, tick-b, tick-c, tick-d**) when it appears, then underline the letter ( ) for **detail**. Use L1, L2, L3, L4, L5 at the end of the response to indicate the **level**. Use the table opposite to mark candidate responses to this question. The four required features for this experiment are: (a) **independent variable**: (different creative activities: e.g. art, music, dance – any two, **<u>operationalised</u>**) (b) **dependent variable**: (sleep 'well', e.g. quality, time asleep, depth of sleep, feeling in the morning/use of an EEG to measure sleep) (c) **controls/standardisation**; (sleep location, time to bed, comfort of bed etc. At least **two**, must be **explicit**) (d) **experimental design**: (**independent measures**, how allocated i.e. random) **And/OR** (d) **location if conducted as a field experiment:** (creative activities in classes etc.) Other appropriate responses should also be credited.	**10**	

Level	The response:
Level 5 9–10 marks	• has **all** the required features, **all** with <u>detail</u>, with mostly appropriate terminology. AND • *clearly applies* knowledge of methodology involved in planning this investigation.
Level 4 7–8 marks	• has **all** the required features, but only **some** of these with <u>detail</u>, with some appropriate terminology. AND • *applies* knowledge of methodology involved in planning this investigation.
Level 3 5–6 marks	• has **some** of the required features with <u>detail</u> / **all** of the required features with **<u>no</u>** <u>detail</u>, and some appropriate terminology. AND • *applies a basic* knowledge of methodology involved in planning this investigation**.**
Level 2 3–4 marks	• has at least **two** of the required features, with little appropriate terminology. AND • *attempts* to use knowledge of methodology involved in planning this investigation.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>10(a)</td><td></td><td></td><td>
<table>
<tr><th>Level</th><th>The response:</th></tr>
<tr><td>Level 1
1–2 marks</td><td>• has one of the required features and uses little appropriate terminology.
AND
• makes a limited attempt to use knowledge of methodology involved in planning this investigation, e.g. may not use the method required by the question.</td></tr>
<tr><td>0 marks</td><td>No creditable response.</td></tr>
</table>
</td></tr>
<tr><td>10(b)(i)</td><td>Explain <u>one</u> advantage of using an independent measures design in this study compared to using a repeated measures design.

Do <u>not</u> refer to ethics in your answer.

Identification of advantage (can be generic) = 1
explanation (linked) = 1

(no) order effects; (generic advantage)
participants only experienced one IV level so would not get bored sleeping at a lab / better at getting to sleep in an unfamiliar place; (link)

(fewer) demand characteristics / participants only see one condition so would have less idea about the aim of the study; (generic advantage)
If they had dance and art classes, they would guess it would affect sleep so would try to sleep / report better sleep (for one condition); (link)</td><td>2</td><td>No marks for ethics</td></tr>
</table>

Question	Answer	Marks	Guidance
10(b)(ii)	**Explain <u>one</u> disadvantage of using an independent measures design in this study compared to using a repeated measures design.** **Do <u>not</u> refer to ethics in your answer.** Identification of disadvantage (can be generic) = 1 **explanation** (linked) = 1 (higher risk of) participant variables / individual differences; (generic disadvantage) the people in one group may all have been better sleepers anyway; (link) sample size needs to be bigger; (generic disadvantage) so, need to get more people who are willing to report their sleep / start or do different creative activities / stop doing creative activities; (link)	**2**	**No marks for ethics**