



Oxford Cambridge and RSA

Monday 12 May 2025 – Afternoon

AS Level Psychology

H167/01 Research methods

Time allowed: 1 hour 30 minutes



You must have:

- a ruler (cm/mm)
- a scientific or graphical calculator



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s) StemUp Model Solution

Last name _____

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.

INFORMATION

- The total mark for this paper is **75**.
- The marks for each question are shown in brackets [].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **20** pages.

ADVICE

- Read each question carefully before you start your answer.

Section A

Multiple choice

For each question write the letter in the box.

1 Which experimental design has participants with similar features or abilities in each condition?

- A independent measures design
- B matched participants design
- C repeated measures design
- D selective measures design

Your answer

B

[1]

2 Which question would produce ordinal data?

- A How do you like to sleep? ☐ on your back ☐ on your front ☐ on your side
- B My favourite food is ☐ spicy ☐ savoury ☐ bitter ☐ sweet
- C Rate how much you like football on a scale 0 ('not at all') to 5 ('very much so')
- D What is your favourite type of movie? ☐ romance ☐ comedy ☐ horror

Your answer

C

[1]

3 Which measure of central tendency involves adding all the scores together and dividing by the number of scores?

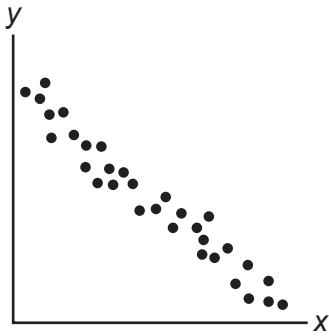
- A mean
- B median
- C mode
- D none of the above

Your answer

A

[1]

- 4 Which option is the best estimation of the correlation coefficient shown in the scatter diagram below?



A -0.9

B -0.1

C +0.1

D +0.9

Your answer

A

[1]

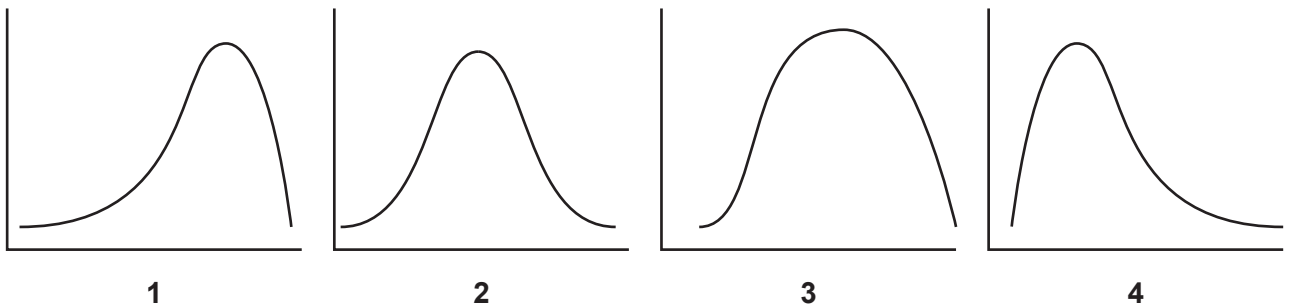
- 5 Which graph shows a positively skewed distribution curve?

A 1

B 2

C 3

D 4



Your answer

D

[1]

6 If the standard deviation of a set of data is 3, what is the variance?

- A 1.5
- B 3
- C 6
- D 9

Your answer

D

[1]

7 In research using the observation method, what does 'non-participant observation' mean?

- A when participants do not do anything that gets recorded
- B when stooges are used
- C when the researcher is not part of the group being observed
- D when there are no participants

Your answer

C

[1]

8 In an observation study, which of these describes event sampling?

- A recording specific behaviours at an event
- B recording specific behaviours at some times but not others
- C recording specific behaviours every time they occur during an uninterrupted period of time
- D recording specific behaviours from selected individuals

Your answer

C

[1]

9 Which of these best describes what a tally chart is?

- A a way of displaying the relationship between two variables in a correlation
- B a way of interpreting data from a self-report
- C a way of presenting a summary of the data in an experiment
- D a way of recording raw data in an observation

Your answer

D

[1]

10 Which of these is **not** a criterion for using parametric inferential statistical tests?

- A data in each condition should be from the same participants
- B data in each condition should have similar variances
- C data should be at least interval level
- D data should be from a normally distributed population

Your answer

A

[1]

11 Which of these research methods best describes what was used in Loftus and Palmer's (1974) study into eyewitness testimony?

- A independent measures design laboratory experiment
- B independent measures design laboratory experiment and self-report
- C repeated measures design laboratory experiment
- D repeated measures design laboratory experiment and self-report

Your answer

B

[1]

12 Which of these is a weakness of the research method used in Grant et al.'s (1998) study into context-dependent memory?

- A individual differences in memory ability in general between participants in the different conditions
- B participants performing better in one condition due to having taken part in another condition already
- C the article being more difficult to read in one condition than another condition
- D the memory tests being more difficult in one condition than another condition

Your answer

A

[1]

13 For how long was visual material presented to the participants in Sperry's (1968) split brain study?

- A $\frac{1}{2}$ second
- B $\frac{1}{5}$ second
- C $\frac{1}{10}$ second
- D $\frac{1}{20}$ second

Your answer

C

[1]

14 Which of these could **not** be the result of a Chi-square inferential statistical test?

- A -0.05
- B 0.00
- C 3.42
- D 11.68

Your answer

A

[1]

15 Which of these is a sub-section of the method section when writing a practical report in psychology?

- A** abstract
- B** introduction
- C** results
- D** sample

Your answer

D

[1]

Section B

Research design and response

Class act

Pupils behave in many different ways in a classroom during a lesson and reveal individual differences that may reflect their personality and style of learning. Some are able to maintain focus and concentrate. Others are easily distracted and may use their phone when they shouldn't, talk to others, and fidget. Knowledge of this could be useful in helping design more effective lessons. A psychologist wants to investigate this further by using the observation method to record the behaviour of pupils in a lesson.

- 16*** Explain how you would use the observation method to investigate the behaviour of pupils in a classroom during a lesson. Justify your decisions as part of your explanation.
You must refer to:

- the behavioural categories in your coding scheme (five behaviours you will look out for)
- the use of time or event sampling
- details of how one ethical consideration would be addressed.

You should use your own experience of practical activities to inform your response.

[12]

I would carry out a structured, non-participant, covert observation of one Year 10 class of about 25 pupils during a normal one hour maths lesson, sitting at the back of the classroom with a clipboard so that I do not interfere with the lesson. I have chosen a structured observation because in my own practical, where my group observed behaviour in the school library, we found that a coding scheme gave us quantitative data that was easy to tally, compare and analyse, whereas unstructured notes were hard to compare between observers.

My coding scheme would contain five clearly operationalised behavioural categories: (1) on-task focus, recorded when a pupil is looking at the teacher, board or their own work; (2) phone use, recorded when a pupil looks at, holds or touches a mobile phone; (3) talking off task, recorded when a pupil speaks to another pupil when the teacher has not asked them to; (4) fidgeting, recorded when a pupil taps a pen, swings on their chair or plays with equipment for more than three seconds; and (5) looking around, recorded when a pupil's eyes are directed away from the teacher, board or work for more than five seconds. I would operationalise the categories this precisely because in my library practical

our first category of 'distracted' was too vague and two of us disagreed about what counted, which lowered our inter-rater reliability, so we rewrote each behaviour as an observable action before collecting the real data.

I would use time sampling. The one hour lesson would be divided into 30 second intervals, and at the end of each interval I would scan the class and place a tally against each category for every pupil showing that behaviour at that moment, using a tally chart with the five categories across the top and the intervals down the side. I have chosen time sampling because in my own library observation we tried event sampling first and found that when several people were distracted at the same time we missed behaviours and could not record everything accurately. Time sampling made the amount of recording manageable and still gave a representative picture of how behaviour changed across the session, so I would use the same technique here to see whether distraction increases towards the end of the lesson.

The ethical consideration I would address is informed consent, because the pupils are under 16. Before the study I would write a letter home to parents or carers explaining the aim of the research, that their child's behaviour would be recorded anonymously during a lesson, and that they could withdraw their child at any time; only pupils whose parents returned the signed consent slip would be included in my coding, and I would also gain written permission from the head teacher acting in loco parentis. In my own practical we had to get consent from the school before observing in the library and we gave everyone a debrief at the end, and I found this made the research ethically acceptable without the pupils knowing exactly what we were observing, which protected the validity of the data. I would do the same here.

- 17 Outline how you could use self-selected sampling to obtain a class of pupils from a school to use as participants for this study.

I would ask the head teacher to send a letter home to the parents of every Year 10 class explaining that a psychologist wants to observe pupil behaviour in a lesson, and the first class whose parents and pupils volunteer by returning the reply slip would become my sample. [2]

- 18 Outline **one** strength and **one** weakness of the use of the observation method in this study.

One strength of using observation in this study is that it has high ecological validity. The pupils are watched in their own real classroom during a normal lesson with their usual teacher, so the phone use, fidgeting and chatting I record are the natural behaviours pupils actually show when learning, rather than behaviour produced in an artificial laboratory task. This means my findings are more likely to generalise to real lessons and be useful for designing more effective lessons.

One weakness is that observation only records what pupils do and cannot explain why they do it. If I tally that a pupil fidgets or looks around the room in my 30 second intervals, I do not know whether this is because they are bored, because the work is too hard, or because they have a condition such as ADHD, so I may misinterpret the behaviour. This limits the conclusions I can draw about pupils' personality or learning style from the observation alone. [6]

- 19 Outline **two** ways that inter-rater reliability could be increased if there were two researchers responsible for recording the behaviour in this study.

- 1 *The two researchers could be trained together before the observation so that they both understand exactly what each of the five behavioural categories means and record them in the same way. For example, we would agree that 'phone use' is tallied only when a pupil is holding or looking at a phone, and that 'fidgeting' means tapping or swinging on the chair for more than three seconds, so both observers would tally the same classroom behaviour identically.*
- 2 *The two researchers could carry out a pilot study on a different class before the real observation. They would both observe the same ten minutes of a lesson, independently tally the pupils' behaviours, then compare their tally charts and correlate their scores. Any category where they disagreed, such as what counts as 'talking off task', would be discussed and redefined so that in the actual study both observers record the pupils' behaviour consistently.*

[6]

- 20 Outline **two** ways that you could reduce possible demand characteristics in your design of this study.

- 1 *I would carry out the observation covertly so the pupils are not aware they are being studied. I would sit at the back of the classroom appearing to be a trainee teacher or teaching assistant taking notes, and the observation would take place during a normal timetabled lesson with the usual class teacher, so the pupils would carry on using their phones, chatting and fidgeting as they normally would rather than behaving well because they know a psychologist is watching them.*
- 2 *I would conceal the true aim of the study from the pupils by using a cover story. The class would be told that the observer is there to watch how the teacher delivers the lesson, for example as part of the teacher's training or appraisal, rather than to record pupil behaviour. Because the pupils believe the teacher is the focus, they would not guess that their own concentration or distraction is being measured and would not change their behaviour to please or annoy the researcher.*

[6]

- 21 Outline what information you would include in a debrief with participants at the end of the study.

*At the end of the lesson I would tell the pupils the true aim of the study, which was to
record how often behaviours such as phone use, talking and fidgeting occur in a classroom so
that more effective lessons can be designed. I would explain that they were observed covertly,
that their data is anonymous, and that they have the right to see their own data and to
withdraw it from the study if they wish. I would also offer to share the conclusions with the
class and the teacher once the data has been analysed, and answer any questions.* [3]

13
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Turn over for the next question

Section C

Data analysis and interpretation

Empathy is the ability to understand and share the feelings of another individual and may be related to the willingness to help another person.

Helping someone is often regarded as being 'kind-hearted', but could it be more of a cognitive process related to the way a person thinks?

To investigate this, a psychologist conducted a correlation study to investigate the relationship between empathy and helping behaviour. Ten people were given a set of 12 questions assessing their ability to empathise. They were then asked to indicate if they would offer help or not in 12 hypothetical situations where a person needed help of some kind.

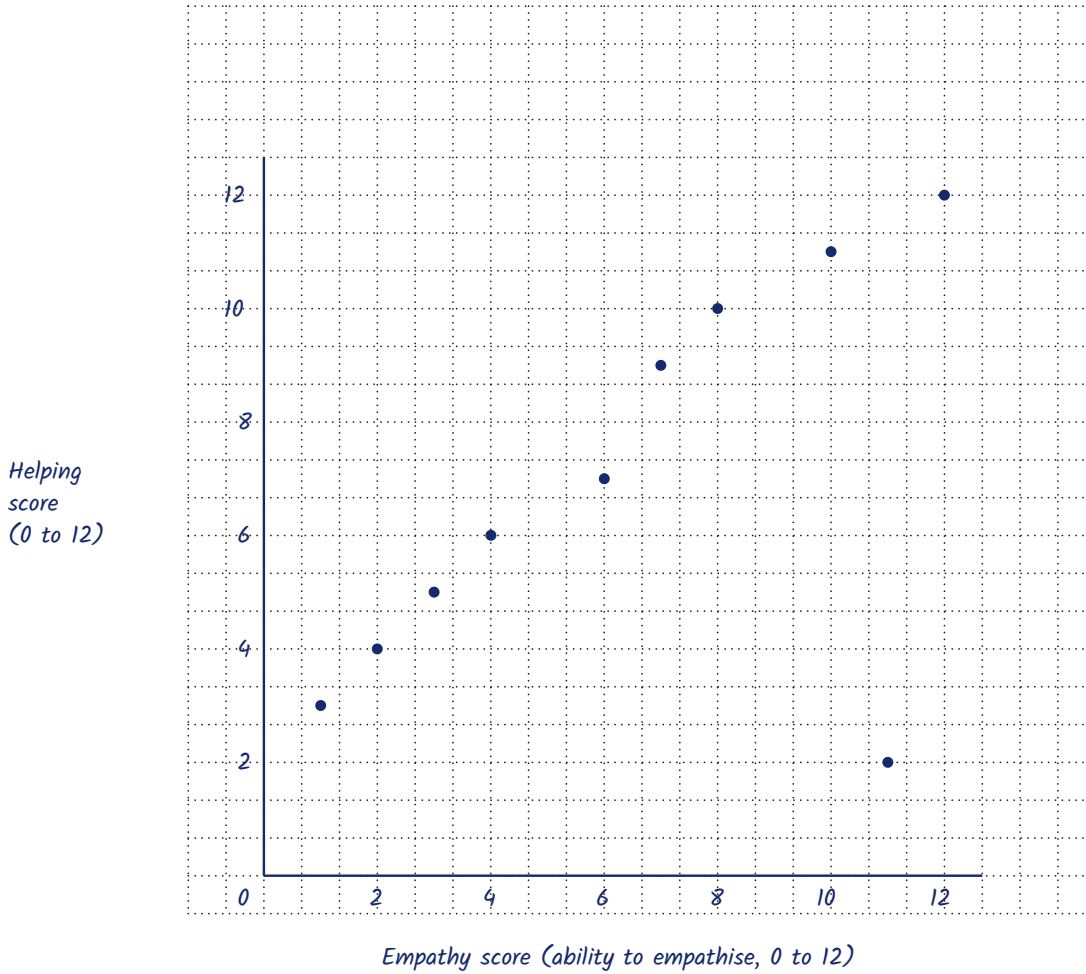
The table shows the data collected in this study.

Participant	Empathy score (0 to 12)	Helping score (0 to 12)
a	7	9
b	12	12
c	3	5
d	6	7
e	10	11
f	2	4
g	1	3
h	11	2
i	4	6
j	8	10

22

(a) Draw a fully labelled scatter diagram displaying the data from this study.

Scatter diagram to show the relationship between empathy score and helping score



[4]

(b) Outline **two** conclusions that can be made from the data displayed in this scatter diagram.

- 1 *There is a positive correlation between empathy and helping: pupils with high empathy scores, such as participant b who scored 12 and 12, also gave high helping scores, while those with low empathy scores, such as participant g with 1 and 3, gave low helping scores. This suggests that the better a person is at understanding and sharing another person's feelings, the more willing they are to offer help, perhaps because they feel the other person's distress themselves.*
- 2 *However, a high empathy score does not always go with a high helping score. Participant h scored 11 out of 12 on empathy but only 2 out of 12 for helping, which suggests that the ability to empathise is not always related to the willingness to help. Other individual characteristics, such as confidence or how much a person thinks helping would cost them, may also influence whether an empathetic person actually decides to help someone in need.*

[6]

- 23 Outline **one** strength and **one** weakness of the use of the self-report method to gather data in this study.

One strength of using self-report here is that it is a quick and easy way to collect data about empathy and helping. All ten participants answered the same standardised set of 12 empathy questions and the same 12 hypothetical helping situations, so the measure is reliable and could be repeated with another group, and it allowed the psychologist to access participants' private feelings and attitudes about others' distress, which could not easily be observed directly.

One weakness is that self-report is prone to social desirability bias. Helping is seen as 'kind-hearted', so participants may say they would help in the 12 hypothetical situations and may overstate how much they empathise in order to look like a good person, when in a real emergency they might walk past. The scenarios are also hypothetical, so the helping scores may not reflect participants' real behaviour, lowering the validity of the data. [6]

- 24 Explain why Spearman's Rho would be the appropriate non-parametric inferential statistical test to use to analyse the data from this study.

Spearman's Rho is a test of correlation, and this study is looking for a relationship between two co-variables, a participant's empathy score and their helping score, rather than a difference between conditions. The data is also ordinal, because each participant has a score out of 12 on the empathy questions and a score out of 12 for helping, which can be ranked but the intervals between scores are not truly equal. Non-parametric ordinal correlation data requires Spearman's Rho. [3]

- 25 Use the formula for Spearman's Rho provided to calculate the value of r_s .
The value of $\sum d^2 = 72$.
Show your workings.

Write your answer to **2** significant figures.

$$r_s = 1 - \frac{6(\sum d^2)}{n(n^2 - 1)}$$

$$r_s = 1 - 6 \times (\text{sum of } d \text{ squared}) / n(n \text{ squared} - 1)$$

$$n = 10 \text{ participants and the sum of } d \text{ squared} = 72$$

$$r_s = 1 - (6 \times 72) / (10 \times (100 - 1))$$

$$r_s = 1 - 432 / (10 \times 99) = 1 - 432 / 990$$

$$r_s = 1 - 0.436 = 0.564$$

$$r_s = 0.56 \text{ to 2 significant figures}$$

[3]

- 26 Explain what it would mean if a type 2 error was made following the analysis of the data in this study.

A type 2 error is a false negative; the psychologist would have accepted the null

hypothesis when it was actually false. In this study it would mean concluding that

there is no significant correlation between empathy score and helping score, and that

any relationship in the data is due to chance, when really a positive relationship

between empathy and helping does exist in the population. This could happen if the

level of significance used was too strict, such as $p = 0.01$ rather than $p = 0.05$.

[3]

END OF QUESTION PAPER

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