



Cambridge International AS & A Level

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PSYCHOLOGY

9990/21

Paper 2 Research Methods

May/June 2023

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.

INFORMATION

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [].

This document has **12** pages. Any blank pages are indicated.



Section A

Answer **all** questions in this section.

- 1 Explain what is meant by the term 'ecological validity'. You may use an example in your answer.

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..... [2]

- 2 In the study by Laney et al. (false memory), different types of items were used in the various questionnaires. Two of the items included:

- rating items on a scale of 1–8 (from 'definitely did happen' to 'definitely did not happen')
- multiple choice items where participants circled a price they would pay for different foods, e.g. \$1.90, \$2.50, or 'would never buy'.

- (a) Explain whether these items are both open questions, both closed questions, or one of each.

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..... [2]

- (b) Laney et al. used a 'critical item' in the profile and in a questionnaire given to the experimental group.

Explain what is meant by a 'critical item', using the example from Laney et al.

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..... [2]

3 In the study by Canli et al. (brain scans and emotions), a repeated measures design was used.

(a) Explain what is meant by a 'repeated measures design'. Include an example from Canli et al. in your answer.

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..... [2]

(b) Explain **one** strength of using a repeated measures design.

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..... [2]

4 Explain **two** ways in which the procedure was standardised in the study by Yamamoto et al. (chimpanzee helping).

1

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..... [4]

- 5 Reliability refers to the consistency of tests, tasks or measures in research.

Explain why reliability is important in experiments.

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..... [2]

- 6 Describe the sampling techniques of 'opportunity sampling' and 'volunteer sampling', using any examples.

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..... [6]

Section B

Answer **all** questions in this section.

- 7 Steve is planning an experiment, using the technique of observation, to compare the level of frustration shown by shoppers in different types of shops. He has set up cameras to help measure the behaviour of shoppers in shops selling basic goods (things that are essential) and shops selling luxury goods (things that are not essential).

(a) Steve is concerned that situational variables could be a problem in his study.

(i) Suggest **two** situational variables that could affect Steve's study.

1

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2

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[2]

(ii) Explain how **each** of the situational variables that you suggested in (a)(i) could be a problem in Steve's study.

1

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[4]

(b) Steve is also concerned about the ethics of his study.

- (i) Suggest why the ethical guideline of right to withdraw would be difficult for Steve to follow in his study.

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..... [2]

- (ii) Suggest why the ethical guideline of privacy would be difficult for Steve to follow in his study.

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..... [2]

8 Leila is conducting a correlational study. She predicts that there will be a correlation between:

- 'success at learning a language'
- 'enjoyment of word puzzles', e.g. crosswords.

(a) Suggest an objective measure of 'success at learning a language' that Leila could use. Justify your answer. Do **not** use a self-report rating scale.

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..... [2]

(b) Leila is measuring 'enjoyment of word puzzles' by asking participants to rate how much they enjoy word puzzles on a scale of 0 (not at all) to 5 (very much).

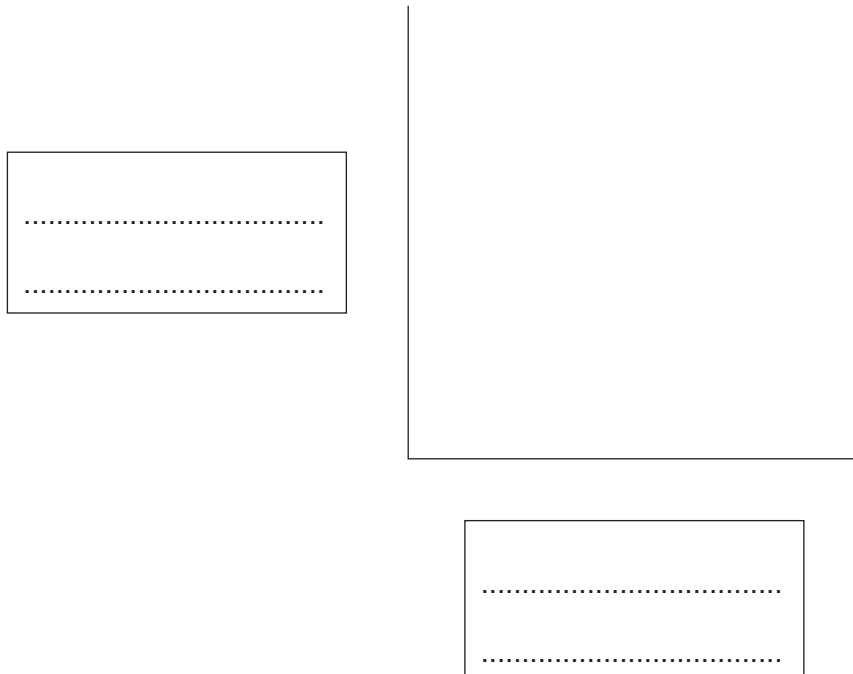
Explain how Leila would calculate the median for 'enjoyment of word puzzles'.

.....

..... [1]

(c) Leila conducts her study. Her results show a positive correlation.

Sketch a graph, using the axes below, to show the pattern of Leila's results. You **must** label the axes.



[4]

- 9 Inma is conducting an experiment about learning. She predicts that animals will learn to find food in a maze faster in the light than in the dark. If an animal does not find the food after 10 minutes, they are given the food by the experimenter.

(a) Inma is using a directional (one-tailed) hypothesis.

Explain why Inma is using a directional hypothesis in her experiment.

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..... [2]

(b) Write a null hypothesis for Inma's experiment.

.....

..... [1]

(c) Inma will use an independent measures design for her experiment.

Explain **one** advantage of using an independent measures design compared to a repeated measures design.

.....

.....

..... [2]

(d) Explain how Inma followed **one** ethical guideline in relation to animals.

.....

.....

..... [2]

10 Dr Clare is planning an observational study of student behaviour in a library at a university. She will be the only observer. She is interested in student behaviours such as:

- (a) Describe how Dr Clare could conduct an observational study to investigate the behaviour of students in a library at a university.

[illegible]

Do **not** refer to ethics or sampling in your answer.

[4]

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9990/22

May/June 2023

1 hour 30 minutes

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Section A

Answer **all** questions in this section.

- 1 From the study by Yamamoto et al. (chimpanzee helping):

Suggest why it was necessary for the chimpanzees to examine and manipulate the tools before the experiment.

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..... [2]

- 2 Chloë is conducting a study to investigate classical conditioning and operant conditioning. Her aim is to test which type of conditioning produces the fastest learning.

- (a) Write a non-directional (two-tailed) hypothesis for Chloë's study.

You do **not** need to operationalise the variables in your hypothesis.

.....

..... [1]

- (b) Chloë's results in the two conditions were the same.

Explain why Chloë **must** reject her non-directional hypothesis, referring to her variables in your answer.

.....

..... [1]

3 The study by Schachter and Singer investigated two factors in emotion.

(a) The participants in this study were deceived.

(i) Outline **one** way that the participants were deceived in this study.

.....

.....

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..... [2]

(ii) Explain why the deception that you outlined in (a)(i) was necessary.

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..... [2]

(b) Schachter and Singer reported that in one condition, the observer could not hear the spoken reactions for one participant.

State **one** practical reason why this was a problem.

.....

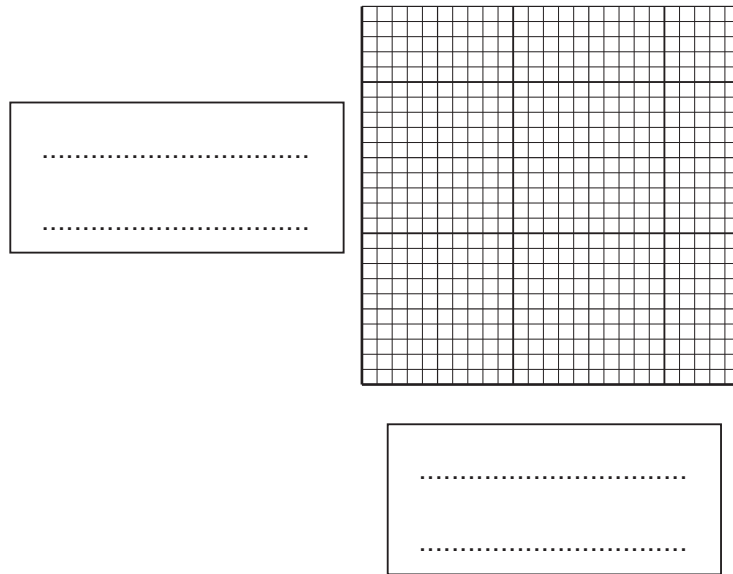
..... [1]

- 4 The data from Experiment 1 in the study by Laney et al. (false memory) is given in Table 4.1.

Table 4.1

Condition	Mean rating for the critical item 'loved asparagus the first time you tried it'	
	Week 1	Week 2
Control	1.5	2.5
Love	1.7	4.2

- (a) Draw a bar chart of the 'Week 2' data only. You **must** label the axes.



[4]

- (b) State **one** conclusion about this study using the data in Table 4.1.

.....
 [1]

- 5 Explain the importance of inter-observer reliability in the study by Bandura et al. (aggression).

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 [2]

- 6 Describe the use of controls in laboratory experiments and field experiments, using any examples.

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..... [6]

Section B

Answer **all** questions in this section.

- 7 Deryn is planning an experimental study to compare how, and how often, men and women look at themselves in a shop window. She plans to collect quantitative data using observations and will calculate a median.

(a) (i) Identify the independent variable in Deryn's study.

.....
 [1]

(ii) Identify **one** dependent variable in Deryn's study.

.....
 [1]

(iii) Identify the experimental design used in Deryn's study.

.....
 [1]

(b) (i) Suggest how Deryn could use a structured observation in her study.

.....

 [3]

(ii) Suggest **one** disadvantage of using a structured observation compared to an unstructured observation in Deryn's study.

.....

 [2]

(c) A 'measure of central tendency' is a method of data analysis.

(i) Explain why the median is a measure of central tendency.

.....
..... [1]

(ii) Suggest **one** strength of using **one** method of data analysis, other than the median, with Deryn's results.

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.....
.....
..... [2]

- 8 Phyllis is planning a correlational study to investigate the relationship between vocabulary size and level of education.

(a) (i) Suggest **two** ways that Phyllis could measure 'vocabulary size'.

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[4]

(ii) For **one** of the ways you have suggested in (a)(i):

Suggest **one** strength of measuring vocabulary size in this way.

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..... [1]

(b) Suggest **one** way that Phyllis could measure 'level of education'.

.....

..... [1]

(c) Phyllis expects to find a positive correlation.

(i) Outline what Phyllis would conclude if she found the results in Fig. 8.1.

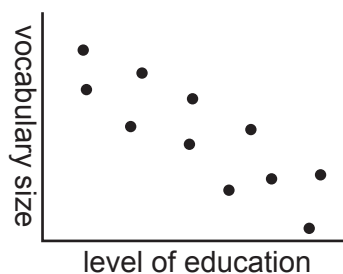


Fig. 8.1

.....

..... [1]

- (ii) Outline what Phyllis would conclude if she found the results in Fig. 8.2.

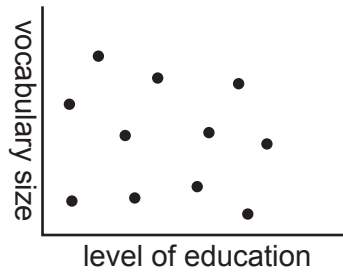


Fig. 8.2

..... [1]

- 9 James is planning a study and has chosen to use opportunity sampling to find participants. A friend says he should use random sampling instead. Another friend says that sample size is just as important as sampling technique.

- (a) Explain **one** strength of using opportunity sampling.

..... [2]

- (b) Explain **one** advantage of using random sampling instead of opportunity sampling.

..... [2]

- (c) Explain why a larger sample may be better than a smaller sample.

..... [1]

Answer **all** questions in this section.

- [illegible]

Do **not** refer to ethics or sampling in your answer.

[4]

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Section A

Answer **all** questions in this section.

- 1 (a) Describe what is meant by the term 'random sampling'.

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.....

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..... [2]

- (b) Explain **one** weakness of random sampling.

.....

..... [1]

- 2 The study by Yamamoto et al. (chimpanzee helping) followed ethical guidelines relating to the use of animals.

Describe how **two** ethical guidelines relating to the use of animals in research were followed in this study.

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2

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[4]

3 In the study by Laney et al. (false memory), standard deviations were calculated.

(a) State what is meant by a 'measure of spread'.

.....
 [1]

(b) State **one** advantage of using the standard deviation compared to **one** other measure of spread.

.....

 [2]

4 In the study by Pepperberg (parrot learning), Alex the parrot was tested using the categories of:

- shape
- material
- colour.

(a) Suggest why Pepperberg chose to test the parrot using the categories of 'shape' and 'material'.

.....

 [2]

(b) Suggest **one** other category that Pepperberg could have used to test the parrot's understanding of categories.

.....
 [1]

- 5** The study by Dement and Kleitman (sleep and dreams) investigated two kinds of sleep: REM sleep and non-REM sleep.

State **three** differences between REM sleep and non-REM sleep.

1

.....

2

3

[51]

[3]

- 6** Describe the ethical guidelines of 'informed consent' and 'protection from harm', using any examples.

.....

.....

.....

.....

.....

[6]

Section B

Answer **all** questions in this section.

- 7 Nigel has conducted a laboratory experiment to compare children's choice of sweets (candy) in different packets. The children were shown sweets in:
- brightly coloured packets with simple patterns
 - black and white packets with complex patterns.

His results showed that more children chose the sweets from the 'brightly coloured packets with simple patterns' condition.

- (a) (i) Suggest **one** other condition that Nigel could have included in his study.

.....
 [1]

- (ii) Explain why the condition you suggested in (a)(i) would have been useful.

.....

 [2]

- (b) Nigel used a repeated measures design.

Explain what is meant by a 'repeated measures design', using an example from this study.

.....

 [2]

- (c) Name **one** experimental design Nigel could have used, other than a repeated measures design.

.....
 [1]

- 8 Mila is planning a case study to investigate how a 21-year-old person feels about being the only young person in a community of 20 older people on a small island.

(a) Suggest **two** techniques Mila could use to collect data from her participant in this study.

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..... [4]

(b) For **one** of the techniques you suggested in (a):

(i) Explain **one** advantage of this technique.

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..... [2]

(ii) Explain **one** disadvantage of this technique.

.....

.....

.....

..... [2]

(c) Mila wants to generalise her findings to all adults who live away from other people of their own age.

Explain why Mila should **not** make this generalisation from the findings of her case study.

.....

..... [1]

- 9 Alan and Jocelyn are writing a questionnaire to ask about the level of euphoria created by listening to music at a concert, compared with listening to music at home.

- (a) (i) Suggest **one** closed question that they could use on the questionnaire to ask about euphoria.

.....
 [2]

- (ii) Suggest **one** open question that they could use on the questionnaire to ask about euphoria.

.....
 [1]

- (b) For the questions you suggested in (a)(i) and (a)(ii):

- (i) Explain **one** reason why the data from the open question could be more valid than data from the closed question.

.....

 [2]

- (ii) Explain **one** reason why the data from the open question could be less valid than data from the closed question.

.....

 [2]

- (c) Explain how Alan and Jocelyn could check their inter-rater reliability when they analyse their data.

.....

 [2]

10 Dr Caesar is interested in animal phobias in his patients. He wants to investigate whether there is a correlation between the size of the animal causing the phobia and the severity of each patient's animal phobia.

- [illegible]

Do **not** refer to ethics or sampling in your answer.

[4]

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