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Cambridge Assessment International Education

Cambridge International AS & A Level

CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/22**

Paper 2 Research Methods **February/March 2025**

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.

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Section A

Answer **all** questions.

1 **(a)** Outline what is meant by an overt observation.

An observation where the participants know that they are being observed, so the observer's role is not hidden. [1]

(b) **(i)** Suggest **one** reason why an overt observation may be better than a covert observation.

Overt observation is more ethical, because the participants know they are in a study, so informed consent can be obtained and they know they can withdraw. In a covert observation participants do not know they are being studied, so they cannot consent or know to withdraw. [2]

(ii) Suggest **one** reason why an overt observation may **not** be better than a covert observation.

Overt observation has a higher risk of social desirability bias, because participants know they are being watched and may change their behaviour to fit the observer's expectations. In a covert observation they have no reason to act more favourably, so their behaviour is more natural. [2]

2 Dr Bryan has been asked to investigate the effects of a new drug for people with a psychological disorder. Each week, Dr Bryan's patients visit him to receive the drug and to report their symptoms.

Explain what makes this investigation a longitudinal study.

A longitudinal study tests the same participants repeatedly over a long period of time. Here the same patients visit Dr Bryan every week, over many weeks, to take the drug and report their symptoms. This lets him track changes in each patient's symptoms over time, to see how well the drug works after several doses.

[3]

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3 In the study by Hölzel et al. (mindfulness and brain scans), two participants withdrew from the sample due to the MRI scan being uncomfortable.

Explain why the withdrawal of these two participants could have reduced the validity of the study.

Losing participants makes the sample smaller and biased. In Hölzel et al. both participants who withdrew were male, introducing a gender bias, and they may have been more stressed than the others, so one gender may respond differently to mindfulness and the results may not generalise. [2]

4 In studies in cognitive psychology, groups of participants are often given tests that produce numerical data so that the groups can be compared.

(a) Outline the **most** appropriate measure of central tendency to use for a maths test in which each question is equally difficult.

The mean, because every question is equally difficult so the test scores are on an interval scale. The mean of the maths test scores uses every participant's score, so it is the most sensitive measure.

[2]

(b) In a study, the measures of central tendency from the maths tests of two groups of participants could be compared.

State the **most** appropriate type of graph to use for this data.

A bar chart (one bar for the mean score of each group).

[1]

5 In the study by Fagen et al. (elephant learning), one way that data was collected about elephant learning was the performance test.

(a) Suggest **one** way that the performance test could have lacked validity. Justify your answer.

The elephant only had to reach 80% correct on a behaviour to pass. This means the other 20% of attempts may have been a bit wrong or a lot wrong, so passing may not truly show the elephant had learned the behaviour.

[2]

(b) Suggest **one** way that the validity of the performance test could have been improved.

Raise the criterion to 90% or 100% correct, or operationalise each behaviour more specifically (e.g. trunk height/orientation). [1]

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6 Describe quantitative data and qualitative data, using any example(s).

Quantitative data is numerical data that can be measured or counted, e.g. from closed questions or rating scales in self-reports, or tallies of behavioural categories in observations. It can be analysed using statistics (e.g. means) and shown on graphs. For example, in Milgram's study the maximum voltage each participant gave (65% went to 450V) is quantitative, as are Andrade's participants' scores for recall of names and places. Qualitative data is descriptive, in-depth data in words, e.g. from open questions in self-reports, transcripts of interviews or unstructured observations. It is analysed by thematic analysis rather than statistics. For example, in Milgram's study the descriptions of participants' reactions, such as sweating, trembling and nervous laughter, and their comments, are qualitative, as is Saavedra and Silverman's description of the boy's button phobia and his feelings of disgust.

..... [6]

7 Jacinda, a factory manager, is planning a study about her workers' interpersonal distance preferences.

(a) Jacinda arranges the distance between workstations. In one section of the factory the distance between the workstations is large, and in another section the distance between the workstations is small.

(i) Suggest **two** situational variables that should be controlled so that they are the same for the two sections of the factory.

1. Temperature of the work area.

2. Amount of noise in each section (e.g. machines or music).

.....

..... [2]

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(ii) For **each** of your suggestions in part **(a)(i)**:

Explain why **each** situational variable would be relevant to Jacinda's study.

1. Temperature: if a section is too hot, being cramped close to colleagues would feel worse, so workers there might prefer a bigger interpersonal distance because of the heat, not the workstation distance.

2. Noise: in a noisier section workers may need to stand closer to colleagues to hear each other when they talk, so they might be happier with a smaller interpersonal distance because of the noise rather than the workstation layout.

[4]

(b) Suggest how Jacinda could obtain a volunteer sample for her study.

Jacinda could send an email to all workers at their company email addresses, or put up a flyer on the staff noticeboard and on each workstation, inviting them to take part in a study about how close they like to work to colleagues. The workers who reply and give their contact details would form the volunteer sample.

[3]

(c) Suggest how Jacinda could measure her participants' interpersonal distance preference, other than by using an interview.

A questionnaire with a closed question, e.g. "How close (in metres) could a colleague's workstation be to yours before you felt uncomfortable?", ticking 0.5m, 1m, 1.5m or 2m or more.

[2]

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8 Dr Foster is conducting research about cognition using monkeys in a laboratory. He wants to provide ethical housing for them, so will investigate which materials the monkeys prefer to sleep on inside their cages. The monkeys will be given two choices: leaves or paper.

(a) (i) Suggest **one** ethical reason why it is important that the monkeys are comfortable in the environment in which they are housed when they are **not** being tested.

Do **not** refer to the ethical guideline of 'housing'.

Discomfort could cause pain and distress (e.g. being uncomfortable or frightened), which breaks this guideline. [1]

(ii) Suggest **one** methodological reason why it is important that the monkeys are comfortable in the environment in which they are tested.

If they are uncomfortable or have not slept well they will not behave normally, so the results would lack validity. [1]

(b) Suggest **one** way to measure which material the monkeys prefer inside their cages.

Put a known weight of leaves and a known weight of paper in each cage, then weigh what is left of each material after the monkeys have nested; more of the preferred material will have been used.

..... [2]

(c) Identify **two** features that are important in the 'housing' guideline in relation to animal ethics. Do **not** refer to the materials inside an animal's cage.

1. Enough space in the cage.

2. Social companions, so social species are not kept in isolation.

..... [2]

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9 A psychologist is investigating whether there is relationship between happiness and exercise. He thinks that either:

- being happier would make people exercise more
- exercising more would make people happier
- happiness and exercise are both affected by another variable.

(a) Explain why it is better to use a correlation than an experiment for this investigation.

The relationship may not be causal, as either variable could cause the other or a third variable could cause both. Also it would be unethical to manipulate happiness, so it would not be possible to isolate an IV, so a correlation is used.

..... [2]

(b) Suggest **one** way that exercise could be measured in this investigation.

The number of steps each participant takes per day.

..... [1]

(c) For the way of measuring exercise you suggested in part **(b)**:

(i) Suggest **one** strength of this way of measuring exercise.

Steps can be counted with a wearable step counter or smart watch, which records automatically and accurately, so the measure is objective and valid, and it is not inconvenient, so people are more likely to take part.

..... [2]

(ii) Suggest **one** weakness of this way of measuring exercise.

Some people walk faster than others, so they do more exercise for the same number of steps, and steps miss exercise like swimming, so the measure may be unreliable and lack validity.

..... [2]

Section B

Answer **all** questions.

10 Dr Anand is interested in conversations that children aged 8–10 years old have with their parents. He wants to know about different features of these conversations, such as:

- how long they talk for
- what they talk about
- how positive they feel about talking to each other.

He intends to study these conversations using structured interviews.

(a) Describe how Dr Anand could use structured interviews to study conversations that 8–10 year old children have with their parents.

Do **not** describe sample/sampling technique or ethical issues/guidelines in your answer.

Dr Anand would use a structured interview, so every child and parent is asked the same questions, in the same order, with the same wording and tone, by the same interviewer, separately in a quiet room. Answers are written on a standard response sheet and audio-recorded, and each interview lasts about 15 minutes. Mostly closed questions would be used, plus a few open questions and some filler questions (e.g. "What is your favourite food?") to hide the aim.

Example questions: "How long did you talk with your parent yesterday?" (none, under 10 minutes, 10 to 30 minutes, over 30 minutes); "Which topics do you talk about most?" (school, friends, hobbies, family, other); "On a scale of 1 (very negative) to 5 (very positive), how do you feel about talking to your parent?"; and an open question "Describe your last conversation with your child." Parents get the same questions worded for adults.

Scoring: answers are coded, e.g. talking time scored 0 to 3 and positivity 1 to 5, so the median rating and the mode topic can be found and child and parent scores compared on bar charts. Open answers are transcribed and analysed for themes (e.g. "worries", "jokes") by two researchers, and the number of answers in each theme counted.

[10]

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(b) (i) Explain how **one** feature of the procedure you described in part **(a)** helps to make the study reliable.

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

Standardisation: every child and parent is asked the same questions in the same order and tone, so the procedure is consistent and could be repeated to give the same results.

..... [2]

(ii) Explain how **one** feature of the procedure you described in part **(a)** could be a problem for reliability of the study.

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

The open questions, e.g. "Describe your last conversation", need interpretation, so two researchers may code the themes differently, giving low inter-rater reliability.

..... [2]

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