Cambridge Assessment International Education

Cambridge International AS & A Level

CANDIDATE NAME: StemUp Model Solution

CENTRE NUMBER | | | | | |

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0647218875

PSYCHOLOGY **9990/22**

Paper 2 Research Methods **February/March 2022**

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 in this section.

1 The study by Andrade (doodling) was a laboratory experiment. One feature of a laboratory experiment is that it has controls to limit the effect of extraneous variables.

(a) State **two** other features of a laboratory experiment.

1 *The independent variable is manipulated by the researcher to create different conditions.*

2 *The dependent variable is measured, in an artificial environment rather than the participants' normal setting.* [2]

(b) **(i)** Suggest **two** controls that were important in this study.

1 *Every participant heard the same recorded message, 2.5 minutes long.*

2 *The volume of the message was set at a comfortable level for each participant.* [2]

(ii) For **one** of the controls you suggested in **(i)**:

Explain how the results could have been affected if this control had **not** been used.

If the message was not recorded it might be read faster to some participants, so it would be harder to remember and their recall would be lower. [1]

2 A study has the experimental hypothesis 'There will be a gender difference in aggression'. This is a non-directional hypothesis rather than a directional hypothesis.

(a) Explain what makes this a 'non-directional hypothesis'.

It only predicts that there will be a difference in aggression between males and females. It does not say which gender will be more aggressive; a directional hypothesis would, e.g. "males will be more aggressive than females". [2]

(b) Write a null hypothesis for this study.

There will be no gender difference in aggression; any difference is due to chance. [1]

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3 In the study by Pepperberg (parrot learning), Alex the parrot was the only participant.

(a) Explain **one** advantage of using one participant in this study.

One participant can be studied in great depth. Pepperberg spent many years training and testing Alex with a lot of trials, which would not be possible with many parrots, and only one bird had to be kept in captivity and tested, which fits the ethical guideline of using as few animals as possible. [2]

(b) Explain **one** disadvantage of using one participant in this study.

The results have low generalisability. Alex may have been an unusually clever parrot, and he was a captive bird raised by humans, so his abilities with colours, shapes and numbers may not apply to other parrots, especially wild ones. [2]

4 State **two** features of a normal distribution.

1 *It is symmetrical and bell-shaped, highest in the middle with tails at each side.*

2 *The mean, median and mode are all the same and are at the highest point.* [2]

5 In the study by Yamamoto et al. (chimpanzee helping), the results included how often the helper's first tool offer was a stick. The percentage of stick offers when a stick was needed and when a straw was needed could be displayed on a bar chart.

Explain why a bar chart would be the **most** appropriate way to display these results.

The data are categorical: the variable "tool needed" has two separate categories, stick needed or straw needed, not a continuous scale. A bar chart shows these separate categories as separate bars, so the percentage of stick offers in each can be compared. [2]

6 Describe 'opportunity sampling' and 'random sampling', using any examples.

Opportunity sampling means using people who are available at the time of the study, such as passers by or students in the researcher's class. For example, Piliavin et al. used the passengers who happened to be on the New York subway train at the time, and Baron-Cohen et al. recruited some participants from an adult community education class and a public library.

Random sampling means every individual in the target population has an equal chance of being selected. The researcher gets a list of the whole population, gives each person a number, and then chooses the sample by drawing numbers out of a hat or using a random number generator. For example, a researcher could take the list of all 600 students in a school and randomly select 30 of them to take part.

[6]

Section B

Answer **all** questions in this section.

7 Clark is a psychologist investigating whether the behaviours people dream about can be done in everyday life or not. He is monitoring participants' sleep in his laboratory and then interviewing them.

(a) (i) Suggest **one** behaviour in dreams that Clark could ask about which can be done in everyday life. Your suggestion **must** be ethical.

Eating a meal.

..... [1]

(ii) Suggest **one** behaviour in dreams that Clark could ask about which **cannot** be done in everyday life. Your suggestion **must** be ethical.

Flying without any help, like a bird.

..... [1]

(b) Clark believes that some participants may lie. For example, they may falsely report dream behaviours to impress Clark.

Suggest **one** way that Clark could minimise this type of lying in his study.

Clark could use an anonymous questionnaire instead of a face-to-face interview, and put the question about impossible behaviours among filler questions (e.g. "How busy were you this week?"). Participants would feel less need to impress him and be less likely to guess the aim. [2]

(c) Clark is concerned that some participants may also lie about their dreams because the events in them are too personal to report to Clark.

Explain which ethical guideline Clark is concerned about.

Privacy. Participants have the right to keep personal information to themselves, so they may not want to tell Clark the content of their dreams, for example if a dream would be embarrassing or distressing to reveal.

..... [2]

(d) Clark thinks that participants' eye movements during dream sleep are related to the content of their dreams.

Suggest how Clark could use participants' eye movements during dream sleep to investigate whether they are lying about their dream content.

He could record eye movements with an EOG/EEG during REM sleep. Eye movements should match the dream content, e.g. a dream of jumping over buildings should give up-and-down eye movements, so if the movements do not fit what they report, they may be lying. [2]

8 Liang is planning to observe behaviour in a park. He is going to sit on a bench and pretend to be using his phone. His aim is to investigate factors which could cause one person to say hello to another person. Two possible factors are age and gender.

(a) Explain whether Liang is conducting a participant observation or a non-participant observation.

Non-participant, because he is only watching from the bench on his phone and does not join in or say hello to anyone himself. [1]

(b) Liang expects that if a person has an animal with them, other people will be more likely to say hello.

Explain **one** other factor for Liang to observe that could affect whether a person says hello. Do **not** refer to age or gender in your answer.

Whether the person is smiling. A smiling person looks friendly and approachable, so other people would be more likely to say hello to them than to someone who is not smiling.

..... [2]

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(c) Liang collects data about the number of males and females who say hello when another person has an animal with them. He plots his data on the graph in Fig. 1.

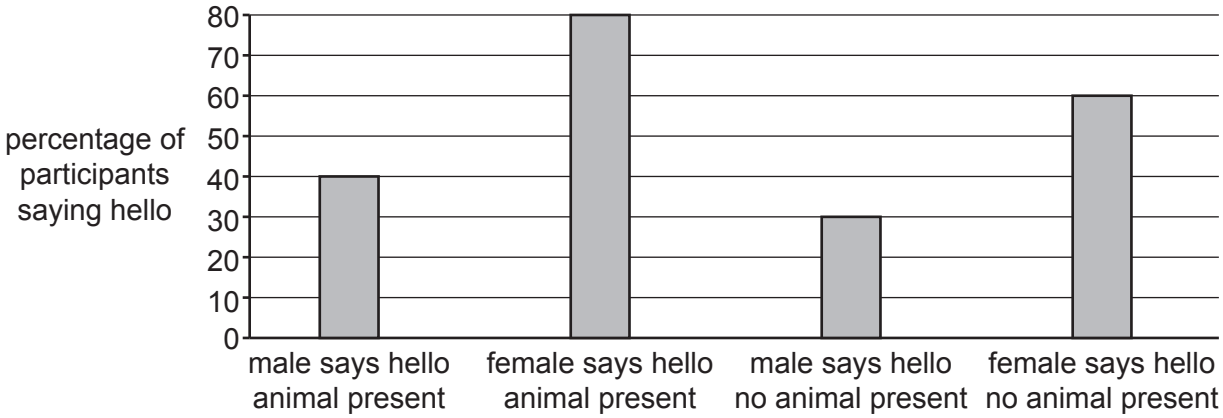


Fig. 1

Suggest **two** conclusions Liang can draw from his data in Fig. 1.

1 *Females are more likely to say hello than males, both with an animal (80% vs 40%) and without (60% vs 30%).*

2 *People are more likely to say hello when an animal is present than when it is not (e.g. males 40% vs 30%).* [2]

(d) Participants could realise that Liang is conducting an observation.

Suggest **two** problems this could cause.

1 *They may change their behaviour because they know they are being watched, e.g. showing social desirability by saying hello more than usual, so the data would not be valid.*

2 *They may feel upset or deceived at being watched without consent, so it breaks the ethical guidelines of informed consent and protection from psychological harm.* [4]

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9 Tara can measure physical reaction time using a machine that records the time between a light flashing and the participant pressing a button. Tara will use this measurement to investigate whether there is a relationship between participants' physical reaction time and how quickly they can recall numbers.

(a) Explain the research method that Tara is using.

A correlation, because Tara is looking for a relationship between two measured, continuous variables, physical reaction time and how quickly participants recall numbers, rather than manipulating an independent variable.

..... [2]

(b) Suggest a procedure Tara could use to measure how quickly participants can recall numbers.

Tara reads out a list of ten single-digit numbers at a rate of one per second. As soon as she finishes she starts a stopwatch and tells the participant to say all the numbers back. She stops the stopwatch when the participant has recalled all ten numbers, and records the time in seconds as the recall speed.

..... [3]

(c) Suggest **one** practical problem with the procedure you have suggested in **(b)**.

Some participants might not be able to recall all ten numbers, so Tara would not know when to stop timing; also her own reaction time in starting and stopping the stopwatch could make the times inaccurate.

..... [2]

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Section C

Answer **all** questions in this section.

10 Justin wants to investigate whether adults are happier when they play particular sports. Many different sports could affect happiness in different ways.

(a) Describe how Justin could conduct a study using a questionnaire to investigate how different sports affect adults' happiness.

Justin would use a self-report questionnaire given to 100 adults aged 18 to 65, both males and females, who play sport at least once a week. He would use an opportunity sample, going to five different sports clubs (football, tennis, swimming, running and yoga) and asking members to take part. Participants would be given a briefing, sign a consent form, be told they can withdraw at any time and that their answers will be anonymous.

The questionnaire would be completed on paper in a quiet room at the club after a training session. Section 1 would ask closed questions: age, gender, which sport they mainly play (tick box), and how many hours a week they play it. Section 2 would measure happiness with Likert-type rating scales, e.g. "After playing my sport I feel happy" rated from 1 (strongly disagree) to 5 (strongly agree), with ten such items, some reversed, e.g. "After playing my sport I feel low", which are scored the other way round. Scores are added so each person has a happiness score from 10 to 50, giving quantitative data. Filler questions, e.g. "How do you travel to the club?", would be included to hide the aim, and a lie question checks honesty. Section 3 would ask an open question: "Explain how playing your sport affects your mood", giving qualitative data that are put into themes such as "social contact" or "stress relief". Justin would compare the mean happiness scores of the players of each sport to see which sport is linked to the most happiness. Finally participants would be debriefed and thanked.

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..... [10]

(b) Identify **one** practical weakness/limitation with the procedure you have described in your answer to part **(a)** and suggest how your study might be done differently to overcome the problem.

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

A weakness is social desirability, because Justin hands out the questionnaires at the sports clubs, participants may give answers that make them seem happier and their sport seem better than it really is, so the happiness scores are not valid. To overcome this, the questionnaire could be completed online at home with no researcher present, and participants could put it in a sealed envelope without their name, so they feel their answers are private and are more likely to answer honestly.

.....

..... [4]

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