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CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/21**

Paper 2 Research Methods **October/November 2020**

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.
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Section A

Answer **all** questions in this section.

1 In the study by Yamamoto et al. (chimpanzee helping), one variable being measured was the object offered by a chimpanzee.

(a) Describe **two** ways in which an 'object offer' was operationalised in this study.

1 *The helper chimpanzee held out an object (a tool) through the panel hole towards the recipient chimpanzee.*

2 *It was recorded as a correct tool (stick or straw) or an incorrect tool (hose, chain, rope, brush or belt), and only the first object offered counted.* [2]

(b) Explain whether this study was ecologically valid.

Partly. Chimpanzees are intelligent, social animals that use tools, so helping another chimpanzee get juice by passing it a tool is behaviour they could show in the wild. However, a hose, chain or belt are artificial objects not found in the wild, where they would use sticks or stones, so the task lacked ecological validity. [2]

2 In the study by Saavedra and Silverman (button phobia), data was collected in the form of statements. During therapy the boy stated that:

- buttons 'emitted unpleasant odours'
- 'buttons are gross'.

(a) Identify this type of data. Include a reason for your answer that refers to the boy's statements.

Qualitative data, because the statements are descriptive expressions of how the boy felt about buttons, e.g. that buttons "emitted unpleasant odours", rather than numerical scores.

[2]

(b) Explain **one** disadvantage of collecting this type of data in this study.

Qualitative data is open to interpretation, so the researchers may be subjective or biased. For example, "emitted unpleasant odours" does not literally make sense for buttons, so Saavedra and Silverman could misinterpret what the boy meant, which reduces reliability. [2]

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3 Explain the difference between a 'measure of central tendency' and a 'measure of spread'.

A measure of central tendency gives one typical or average value that represents the middle of a set of scores. A measure of spread shows how dispersed or varied the scores are, i.e. how big the differences between the scores are.

..... [2]

4 The study by Laney et al. (false memory) used an independent measures design. However, there was still a risk of order effects.

(a) Explain what is meant by 'order effects', using this study as an example.

Order effects are when performance on a task is affected by having done the same task or condition earlier. Practice effects improve performance through familiarity; fatigue effects make it worse through boredom or tiredness. In Laney et al. the participants filled in the food questionnaires (Food History Inventory and Restaurant Questionnaire) twice, so the second time they might remember and repeat their earlier answers (practice) or get bored and answer carelessly (fatigue). [3]

(b) Explain why order effects reduce validity in experiments.

Differences between the results may be caused by the order of the tasks rather than by the levels of the independent variable. [1]

5 Explain why following ethical guidelines can cause demand characteristics.

Demand characteristics are features of a study that tell participants what is expected of them, so they change their behaviour. Following guidelines such as informed consent and avoiding deception means participants are told the aim and procedure in advance, so they are more likely to guess what the researcher wants and act to fit (or spoil) it. [2]

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6 Describe the difference between 'samples' and 'populations' in research, using any examples.

A population is the whole group of people (or animals) that the researcher is interested in and that the results are meant to represent, e.g. all people who share a characteristic such as being male American adults. A sample is the smaller group selected from that population who actually take part in the study, and the results from the sample are generalised back to the population. They differ because a population contains a great deal of variation, whereas a sample only contains some of it, so a sample may be biased and unrepresentative. For example, in Milgram's study the population was American men aged 20 to 50 living in the New Haven area, with a range of occupations, but the sample was just 40 men who answered a newspaper advert. In Yamamoto et al. the population is chimpanzees, but the sample was only 5 captive chimpanzees at the Kyoto primate research institute, and in Pepperberg's study the population is African grey parrots, but the sample was one captive parrot, Alex. [6]

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Section B

Answer **all** questions in this section.

7 Aileen is planning an interview-based study to investigate what old people often forget. She is concerned that this could break the ethical guideline of 'privacy'.

(a) (i) Explain what is meant by the ethical guideline of privacy, using Aileen's study as an example.

Privacy means participants have the right not to have their personal space or thoughts invaded if they do not want to share them. Aileen's elderly participants may not want to talk about personal or embarrassing things they forget, such as forgetting to put in their false teeth. [2]

(ii) Suggest how Aileen could ensure that she follows the ethical guideline of privacy in her study.

In the brief she could tell them that they do not have to answer any question they do not want to and remind them of their right to withdraw, so they can easily refuse to talk about embarrassing things they have forgotten, such as how to get dressed. [2]

(b) Aileen wants to be certain that the forgetting is due to her participants' age. She could do this by making her study into an experiment, using two groups of participants.

(i) State how Aileen could operationalise her **two** groups of participants.

Younger adults aged 20 to 30 years and older adults aged 70 to 80 years.

..... [2]

(ii) Aileen believes that a possible extraneous variable is whether any participant has a job.

Explain the effect that this extraneous variable could have on the results.

Having a job means people use their memory more every day and may use reminders such as a work diary, which could improve memory. Younger participants are more likely to have a job, so they may forget less because of how much they use their memory, not because of their age. [2]

8 Elaf used a natural experiment to investigate the effect of noise on sleep. His participants completed identical questionnaires before the opening of a new motorway behind their houses and after the motorway had been open for one month.

(a) Explain what is meant by a 'natural experiment', using this study as an example.

In a natural experiment the independent variable is not manipulated by the researcher; it changes naturally and the researcher just measures the effect. Elaf could not control when the motorway opened, so the noise (before vs after opening) occurred naturally. [2]

(b) Suggest **one** problem with natural experiments, using this study as an example.

There are fewer controls than in a laboratory experiment, so extraneous variables may affect the results. For example, residents may have been angry or stressed about the new motorway, and this, rather than the noise, could have made them sleep badly.

[2]

(c) **(i)** Identify the experimental design used in Elaf's experiment. Include a reason for your answer.

Repeated measures, because the same participants were in both levels of the IV: all of Elaf's participants completed the questionnaire both before the motorway opened (quiet) and after it had opened (noisy).

[2]

(ii) Explain **one** advantage of using this experimental design in Elaf's experiment.

Participant variables are controlled because each person acts as their own baseline. People differ in how well they normally sleep and how sensitive they are to noise, which could distort the results if different people were in each condition. [2]

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9 Jasmin conducted an overt observation of friendship behaviours on customers in a café for many weeks. She observed the same customers every day, who initially asked her what she was doing. She explained that she was taking notes on their behaviour.

(a) Explain what made Jasmin's study an overt observation.

The customers knew they were being observed; Jasmin sat openly taking notes and told them she was taking notes on their behaviour. [1]

(b) Suggest **one** advantage of overt observations, using Jasmin's study as an example.

Because Jasmin observed the same customers every day for many weeks, they would become used to her being there, so after a while they would stop changing their behaviour because they knew she was watching, and the friendship behaviours recorded would be natural. [2]

(c) Suggest **one** disadvantage of overt observations, using Jasmin's study as an example.

The customers know they are being watched, so there is a risk of demand characteristics or social desirability: they may show more friendly behaviour than normal, e.g. smiling or chatting more, so Jasmin's data would overestimate friendship behaviour. [2]

(d) **(i)** Suggest **two** behavioural categories that Jasmin could have used to record 'friendship behaviours'.

1 *Smiling at each other.*

2 *Physical contact, e.g. hugging, handshakes or high fives.* [2]

(ii) For **one** of the behavioural categories you suggested in **(d)(i)**:

Explain **one** disadvantage of using this behavioural category.

Behavioural category: *Smiling at each other*

Disadvantage: *A smile may be polite or sarcastic rather than friendly, so smiles may be recorded as friendship behaviour when they are not, which reduces validity.* [1]

Section C

Answer **all** questions in this section.

10 Valerie is a teacher. She notices that students who are expecting a test in another lesson are more likely to feel angry in her lesson. She thinks this is because they are misinterpreting their high level of arousal as anger rather than anxiety about the test. She decides to use a questionnaire to investigate whether her students are misinterpreting their arousal.

(a) Describe how Valerie could conduct a study using a questionnaire to investigate whether students who are expecting a test in another lesson are misinterpreting their arousal.

Design and sample: an independent measures design comparing two conditions. Valerie would use two of her own classes of 16 to 17 year olds (about 30 students each): one class that has a test in the lesson straight after hers (test condition) and one with no test that day (no-test condition). Students would be told the questionnaire is about "how students feel in lessons", that it is anonymous and that they can leave any question blank or withdraw.

Where and when: the paper questionnaire would be handed out in Valerie's classroom 10 minutes into her lesson, completed individually in silence in about 10 minutes, and handed back in a sealed envelope.

Questions: closed questions on a 1 (not at all) to 5 (very much) rating scale would measure arousal, e.g. "How fast is your heart beating right now?" and "How tense do your muscles feel?", and emotion, e.g. "How angry do you feel?" and "How anxious or nervous do you feel?". Two closed questions would ask "Do you have a test later today? Yes / No" and "What do you think is causing how you feel right now?" with options such as "this lesson", "something later today" and "nothing". An open question would ask "Describe how you are feeling and why." Filler questions, e.g. "How much do you enjoy this subject?", would hide the aim, and a lie question, e.g. "I have never felt annoyed in a lesson: Yes / No", would identify dishonest answers.

Scoring and analysis: arousal, anger and anxiety scores would each be totalled (out of 10). Students would be classed as misinterpreting their arousal if their arousal score is high (7 or more) and their anger score is higher than their anxiety score. Valerie would compare the percentage of misinterpreters and the mean scores in each

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condition in a bar chart. The open answers would be analysed for themes, e.g.

blaming her lesson for feeling "wound up". If the test group has high arousal but

labels it anger, this supports her idea.

[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.

Weakness: students may give socially desirable answers, e.g. not admitting that they

feel angry in their teacher's own lesson, so the anger scores may not be valid.

Improvement: another teacher, not Valerie, would give out the questionnaire in her

lesson while she leaves the room, and it would be completed online on tablets so

answers are clearly anonymous and Valerie cannot recognise handwriting. Students

would also be told there are no right or wrong answers, so they are more likely to

report their real anger and anxiety.

[4]

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Cambridge International AS & A Level

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PSYCHOLOGY **9990/22**

Paper 2 Research Methods **October/November 2020**

1 hour 30 minutes

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Section A

Answer **all** questions in this section.

1 In the study by Saavedra and Silverman (button phobia), the results were the effect of the therapy sessions on button manipulation and on severity rating of distress. These are shown in Fig. 1.1 and Fig. 1.2.

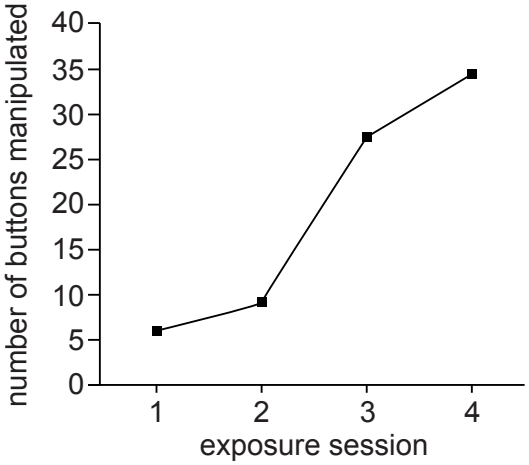


Fig. 1.1

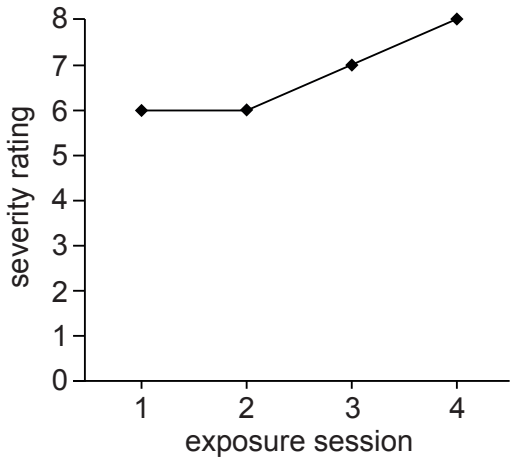


Fig. 1.2

Explain **one** conclusion from the results on each graph. You **must** refer to the results in each conclusion.

Fig. 1.1 *The therapy worked, because the boy was able to manipulate many more buttons in later exposure sessions: the number rose from about 6 in session 1 and 9 in session 2 to about 28 in session 3 and 35 in session 4.*

Fig. 1.2 *The exposure made the boy more distressed in the short term, because the severity rating of his distress stayed at 6 in sessions 1 and 2 and then rose to 7 in session 3 and 8 in session 4, as he handled more buttons.* [4]

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2 From the study by Laney et al. (false memory):

(a) State why a false memory about liking asparagus would be more ethical than a false memory created using filmed events like car crashes and thefts.

Car crashes and thefts could be distressing or frightening, so would risk psychological harm, whereas liking asparagus is harmless. [1]

(b) Explain **one** way in which the study by Laney et al. was **not** ethical.

It used deception. Participants were told the study was about food preferences and personality, not false memory, and were given false feedback that they loved asparagus as a child, so they could not give fully informed consent. [2]

3 Libby is planning a case study of a boy with autism to investigate his social interactions.

(a) Explain how Libby could use **two** different techniques to collect data in her case study.

1 *Interview: Libby could ask the boy face-to-face questions about his social interactions, e.g. "How do you feel when another child asks you to play?", and also interview his parents and teachers about how he gets on with others.*

2 *Observation: Libby could watch the boy at school in the playground and classroom, tallying behavioural categories such as making eye contact, starting a conversation and joining a game, to see what situations his social interactions occur in.* [4]

(b) For **one** of the techniques you explained in **3(a)**:

Suggest **one** problem with using this technique in this study. Do **not** refer to generalisability in your answer.

Technique: *Observation*

Problem: *If Libby observes openly, her presence may change the boy's behaviour, e.g. he may interact with other children less (or more) than normal because a stranger is watching, so the data on his social interactions would not be valid.* [2]

4 In the study by Canli et al. (brain scans and emotions), the dependent variable of emotional arousal was measured by the participants pressing buttons 0, 1, 2 or 3.

Suggest why it was necessary for the participants to press buttons rather than speaking or writing.

They were lying in an fMRI scanner and had to keep their heads still; speaking or writing would involve moving, but pressing a button only needs a finger. [1]

5 In a study about phobias, researchers have identified two problems.

(a) One problem is that they cannot be sure that they are studying phobias rather than just dislikes. For example, people may refuse to eat a food they claimed to have a phobia of simply because they don't like it.

Explain whether this is a problem of validity or reliability.

Validity or reliability: Validity

Explanation: They would be measuring dislikes rather than phobias, so they are not measuring what they intend to measure. [1]

(b) Another problem is that they cannot be sure that they are measuring phobias consistently. For example, the researchers may interpret the participants' written comments differently.

Explain whether this is a problem of validity or reliability.

Validity or reliability: Reliability

Explanation: Different researchers may record different scores from the same written comments, so the measurement is not consistent (low inter-rater reliability). [1]

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6 Describe different types of hypothesis in research, using any examples.

A hypothesis is a testable prediction based on the aim of a study. The alternative (experimental) hypothesis is the one being tested: in an experiment it predicts a difference between the levels of the IV, and in a correlational study it predicts a relationship between two variables. It can be directional (one-tailed), predicting which condition will do better or whether a correlation is positive or negative, e.g. Dement and Kleitman predicted that more dreams would be recalled from REM sleep than from non-REM sleep. A non-directional (two-tailed) hypothesis just predicts a difference or relationship, e.g. "There is a correlation between AQ score and Eyes Test score." The null hypothesis is used in statistical testing and predicts no difference or relationship, or that any difference is due to chance, e.g. "There is no difference in dream recall from REM and non-REM sleep." Baron-Cohen et al. predicted a directional negative correlation between AQ and Eyes Test score. [6]

Section B

Answer **all** questions in this section.

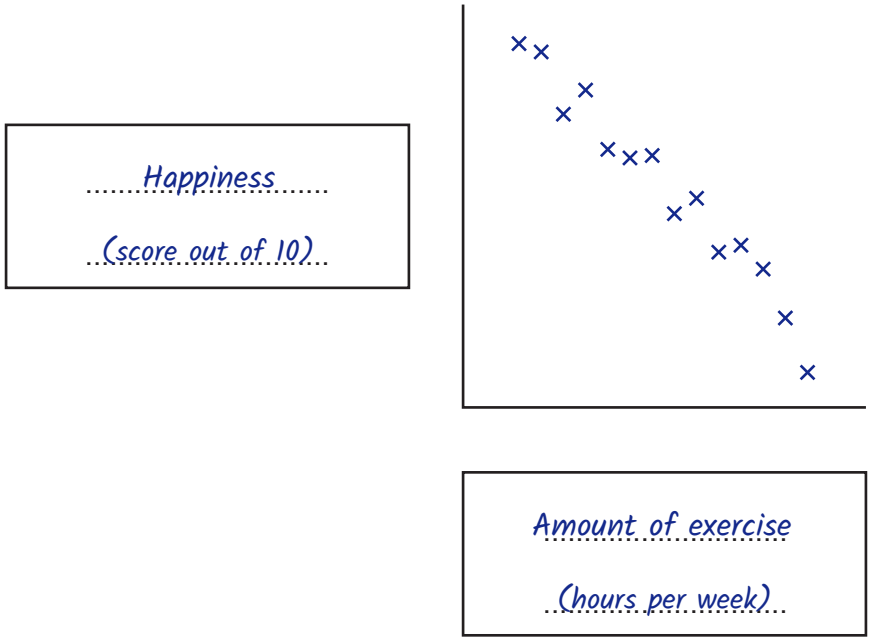
7 Claus is investigating whether there is a correlation between happiness and exercise.

(a) **(i)** Outline what the results would show if Claus found a negative correlation.

As the amount of exercise increases, happiness decreases (and vice versa).

..... [1]

(ii) Sketch a graph, using the axes below, to show what the pattern of results would look like if Claus found a negative correlation. You **must** label the axes.



[3]

(b) Explain why Claus cannot conclude that exercise causes unhappiness.

A correlation cannot show cause and effect. The direction could be the other way, e.g. being unhappy might make people exercise more to cope with stress, or a third variable such as a stressful job could make people both exercise more and feel less happy.

..... [2]

(c) Explain why it was useful for Claus to conduct a correlational study before using another method to investigate factors affecting happiness.

A correlation can identify a relationship that is worth investigating further. Claus could then run an experiment, manipulating exercise as the IV (e.g. 0 or 3 hours a week) to see whether it causes a change in happiness.

..... [2]

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8 Duncan is conducting an experiment to test whether watching videos of natural scenes or city scenes is better at helping stressed people to relax. Half of the participants watch the natural scenes first and the city scenes one week later. The other half of the participants watch the city scenes first and the natural scenes one week later.

(a) Identify Duncan's experimental design. Include a reason for your answer.

Repeated measures, because the same participants are used in both levels of the IV: all participants watch both the natural scenes and the city scenes (in different orders).

..... [2]

(b) Explain why it is an advantage that the participants watch the scenes in different orders.

This counterbalancing reduces order effects. If everyone watched natural scenes first, they might be bored by the second video (fatigue) and less relaxed anyway, so differences could be due to order; with half in each order these effects cancel out.

..... [2]

(c) Duncan obtains his sample from the student population at his university, who all live in the local city.

Suggest **one** disadvantage of taking a sample from this location for this study.

They all live in the city, so they are used to city scenes, which may be familiar and relaxing (or especially irritating) to them. Their results would be biased and could not be generalised to people from rural areas.

..... [2]

(d) In order to ensure that his participants are stressed before watching the videos, Duncan could scare them but this would be unethical. He must stress them in an ethical way. He decides to do this by raising their arousal level.

Describe **one** ethical way that Duncan could stress his participants by raising their arousal level.

He could let them play an exciting computer game of their choice, e.g. a racing game, for 10 minutes. This raises arousal through excitement but is not harmful, as it is something people choose to do for fun anyway.

..... [2]

9 Lydia is planning to interview students about how they learn a new language.

(a) Suggest **one** open question that Lydia could ask during her interviews.

"Describe what you do to learn new vocabulary in a new language."

..... [1]

(b) Suggest **one** disadvantage of using open questions in this study.

Open questions produce qualitative data that is not numerical, so it is hard to analyse and compare. For example, it would be hard to compare how students learning different languages go about learning them.

..... [2]

(c) Lydia's first language is English. Her participants speak a variety of different first languages, although all can understand English.

Explain why the variety of first languages spoken by the participants could still be a problem in Lydia's study.

The interviews would have to be in English, which is not the participants' first language, so they may not be able to explain their learning fully, and Lydia might not understand exactly what they mean, whereas English speakers could answer in their first language.

..... [2]

(d) Suggest what type of interview Lydia should conduct in this study. Include a reason for your answer.

A semi-structured interview. Lydia could ask every participant the same set questions, so the answers can be compared between students, and also ask follow-up questions specific to each person, which makes the data more valid. For example, she could ask everyone "How do you learn verb patterns?" and then follow up an individual's answer about using flashcards or apps to remember nouns.

..... [3]

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Section C

Answer **all** questions in this section.

10 Anisha and Megane are supervisors who walk around the school during lunchtime to watch the children in the building, playground and lunch hall. They have been asked by Sue, who is head of the psychology department, to be observers in a study on helpful behaviour in the school.

(a) Describe how Sue could conduct a participant observation of helping behaviour in school, using Anisha and Megane to assist her.

Design: a naturalistic, overt participant observation in school during lunchtimes for 4 weeks. Sue, Anisha and Megane are participant observers because they carry on their normal role as supervisors, walking around the building, playground and lunch hall and talking to the children, while also observing. Participants are all the children in the school (aged 11 to 16) who are present at lunchtime; parents and the head teacher give consent beforehand.

Behavioural categories: helping behaviour would be operationalised as: (1) picking up or carrying something for someone else, e.g. dropped books or a lunch tray; (2) comforting someone who is upset or hurt, e.g. putting an arm round them; (3) sharing food or equipment; (4) showing or explaining something, e.g. helping with homework or a game's rules. The observers would learn these definitions and practise using them before the study.

Recording: a structured observation using event sampling. Each observer has a tally chart on a clipboard, which is normal for supervisors, and is given an area: Anisha the playground, Megane the lunch hall and Sue the corridors and building. Each time a helping act occurs she tallies it in the correct category and notes the gender and approximate age of the helper and the location. The observers swap areas each week so that observer differences do not affect the location data.

Reliability: for the first two days Anisha and Megane observe the same area together and their tallies are correlated to check inter-observer reliability.

Analysis: the total frequency of each type of helping is calculated per lunchtime, and the mean number of helping acts per day is compared between locations and between

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boys and girls using bar charts. Children are not named, so data are confidential.

..... [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.

Weakness: because Anisha and Megane are also supervising, they have to stop and deal with incidents, such as a fight or an injured child, so they will miss helping acts and the tallies will be incomplete, which reduces the validity of the data.

Improvement: instead of recording continuously, each observer would use time sampling, recording for 5 minutes in every 15 from a fixed spot, while another supervisor covers any incidents during those 5 minutes, so every recording period is complete and equal in length.

..... [4]

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Cambridge International AS & A Level

CANDIDATE NAME: StemUp Model Solution

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PSYCHOLOGY **9990/23**

Paper 2 Research Methods **October/November 2020**

1 hour 30 minutes

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Section A

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1 From the study by Bandura et al. (aggression):

(a) Identify **one** example of quantitative data collected in this study.

The number of times a child hit the Bobo doll with the mallet.

[1]

(b) Explain **one** advantage of collecting quantitative data in this study.

It can be analysed statistically, so Bandura et al. could calculate the mean number of imitative aggressive acts for boys and girls in each condition and compare them. It is also objective, so the observers are less likely to be biased, e.g. expecting boys to be more aggressive. [2]

2 In the study by Andrade (doodling), the participants were people from the general public who were members of an Applied Psychology Unit participant panel.

Explain **one** advantage and **one** disadvantage of using participants from a participant panel in this study.

Advantage: *The panel members were from the general public, aged 18 to 55 with a range of jobs, so they were more varied than a student opportunity sample. They would differ in how much they normally doodle and how well they pay attention, so the results are more generalisable.*

Disadvantage: *They volunteered for a research panel, so they are likely to be highly motivated and interested in psychology studies. They may try harder than normal to listen to the boring phone message and remember the names, so their recall may be better than other people's.* [4]

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3 Carrie is studying when people decide to eat meals and the quality of their sleep. She is worried about variables that could affect when people decide to eat meals, and the effect these could have on validity.

(a) (i) Suggest **one** participant variable that could affect when people decide to eat meals.

Whether they are dieting.

..... [1]

(ii) Explain how this participant variable could affect the validity of Carrie's study.

Dieters may eat later or less and go to bed hungry, so sleep may be affected by hunger, not meal time. [1]

(b) (i) Suggest **one** situational variable that could affect when people decide to eat meals.

Having a shift-work job that stops them eating at normal meal times.

..... [1]

(ii) Explain how this situational variable could affect the validity of Carrie's study.

They would eat irregularly and shift work itself disturbs sleep, so poor sleep may be due to the job, not meal time. [1]

4 Dement and Kleitman studied participants who were asleep.

Explain **one** limitation in research with participants who are asleep that does not apply to participants who are awake. You must refer to the study by Dement and Kleitman in your answer.

You cannot talk to sleeping participants. Dement and Kleitman had to wake them with a doorbell to ask about their dreams, so they were no longer asleep and, still being sleepy, may only have recalled part of the dream.

..... [2]

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5 **(a)** Explain what is meant by the ethical guideline of 'reward' in relation to animals in psychological research.

Animals should be motivated with pleasant rewards, e.g. food treats, rather than punishment or deprivation such as starving them. [1]

(b) Describe how the ethical guideline of 'species and strain' affects what psychologists should, or should not, do with animals.

Psychologists should choose a species or strain that will suffer the least pain or distress from the procedures, e.g. one bred for laboratories. However, it must still be suitable for the aim of the research, so the choice is a compromise between welfare and usefulness. [2]

6 Describe the similarities and differences between a structured and an unstructured interview, using any examples.

Both structured and unstructured interviews are self-report methods in which a researcher asks a participant questions, usually face-to-face or by telephone in real time, and both can collect detailed data about thoughts and feelings. In a structured interview the questions are set in advance and every participant is asked the same questions in the same order, often with a standardised tone and dress for the interviewer, so the data are easy to compare and the interview is replicable. For example, Dement and Kleitman woke participants and asked them the same set question, to describe their dream. In an unstructured interview there are few set questions; the interviewer is flexible and adds new questions in response to what the participant says, usually open questions producing more detailed qualitative data, but answers are harder to compare. For example, Schachter and Singer asked participants "How are you feeling?" and could follow up their answers. [6]

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Section B

Answer **all** questions in this section.

7 A company is having a new kitchen built that will produce better quality food for its workers so will improve work output. Cedric measures work output three weeks before the new kitchen opens, as a baseline. He finds work output is low. When Cedric measures work output again three weeks after the new kitchen opens, he finds that work output is higher.

(a) State how Cedric could operationalise the independent variable in his study.

The IV is the quality of the food, operationalised as food from the old kitchen (three weeks before it opens) compared with food from the new kitchen (three weeks after it opens).

..... [2]

(b) State how Cedric could operationalise the dependent variable in his study.

The DV is work output, operationalised as the mean number of products completed per worker per day (or emails sent per day) during each three-week period.

..... [2]

(c) **(i)** Suggest **one** extraneous variable that could affect Cedric's results.

The work pressure (workload) at that time.

..... [1]

(ii) Explain why it is necessary to control this variable in this study.

If workers are busier after the kitchen opens, output may rise anyway, not due to food. ..... [1]

(iii) Suggest **one** way that Cedric could control this variable.

Cedric could conduct the study at a time when the workload is steady, e.g. both three-week periods having the same number of orders and no deadlines, so there is no other reason for output to change.

..... [2]

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(d) Cedric's study was a natural experiment.

Give **one** reason why Cedric had to choose this method for his study.

The IV (the opening of the new kitchen) occurred naturally, so Cedric could not control or manipulate the food quality himself. [1]

8 Jeni implanted false memories about feeling ill in two different contexts:
- relating to food
- relating to location.

Her laboratory experiment tested participants' confidence that these 'memories' were true. She used a ten-point rating scale to measure this confidence.

(a) (i) Suggest why Jeni used a ten-point rating scale for confidence rather than asking participants if they were confident in the 'memory' or not.

Confidence is a matter of degree, so a ten-point scale gives ordinal data showing how confident each participant is. Jeni can distinguish people who are very sure the memory is true from those only slightly sure, which a yes/no answer could not show. [2]

(ii) Suggest **one** disadvantage of using a ten-point rating scale in this study.

Individuals may interpret the scale differently, so a rating of 5 may mean "quite sure" to one participant but "unsure" to another, which makes comparisons between participants and conditions less valid. [2]

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(b) Jeni knew that many factors could affect memory and she wanted to obtain results that could be generalised beyond her sample.

(i) Identify **one** sampling technique that Jeni could have used to obtain a representative sample.

Random sampling.

..... [1]

(ii) Suggest how Jeni could have obtained a sample using the sampling technique you have suggested in **(b)(i)**.

Jeni would get a list of everyone in her target population, e.g. all students at her university, and give each person a number. A computer random number generator would then select e.g. 50 numbers, so every person has an equal chance of being chosen.

..... [2]

9 Daniel is planning a correlational study. He is investigating the relationship between how happy a person is and how many friends they have.

(a) Suggest how Daniel could operationalise each variable.

Happiness: each person completes a mood questionnaire of 10 questions such as "Do you think this year is going well?", each rated from 0 (not at all) to 5 (very), giving a happiness score out of 50.

Number of friends: ask each person to count how many close friends they have, i.e. people they meet or talk to at least once a month, not including family, work colleagues or acquaintances such as contacts on their phone.

..... [4]

(b) Explain why Daniel should be concerned about the subjectivity of his data about happiness.

Not everyone sees happiness in the same way: some people think happiness is feeling calm, others think it is feeling excited, so the same score or comment could mean different things, and if answers are qualitative Daniel would have to interpret them subjectively. ..... [2]

(c) Explain why Daniel should be concerned about **one** extraneous variable that could affect his data about friendships.

Whether people live in a rural or built-up area. People in rural areas meet fewer people, so they may have fewer friends because of where they live, not because of how happy they are, which would distort the correlation.

..... [2]

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Question 10 appears on page 10

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Section C

Answer **all** questions in this section.

10 Jayce owns a shop and is concerned that people are disobeying his signs which say 'Do not touch' or 'No food allowed'. Jayce has asked his daughter Kimberley, who is studying psychology, for some help to understand this disobedience.

(a) Describe how Kimberley could conduct a non-participant observation of people in her father's shop to investigate obedience to his signs.

Design: a naturalistic, structured, covert non-participant observation. Kimberley would not take part in shopping; she would sit at a fixed point near the checkout, appearing to do paperwork for her father, with a clear view of the "Do not touch" displays and the "No food allowed" sign at the door, so customers do not know they are being observed and behave naturally.

Participants and timing: all customers aged about 16 or over who enter the shop during six one-hour sessions spread across two weeks, on different weekdays and weekends at both busy (e.g. 12 to 1 pm) and quiet times, to give a typical range of shoppers.

Behavioural categories: disobedience would be operationalised as (1) touching a product on a "Do not touch" display with the hand; (2) picking up a "Do not touch" product; (3) entering with visible food or a drink; (4) eating or drinking inside the shop. Obedience would be recorded as (5) looking at the sign and walking past without touching, and (6) leaving food outside or putting it away after seeing the sign.

Recording: event sampling on a tally chart, with one row per customer, recording each category, the customer's estimated age group and gender, and whether they were alone or with others. Before the study Kimberley would practise with the categories for one session. A second observer, e.g. a friend also studying psychology, would observe two of the sessions separately so their tallies can be correlated to check inter-observer reliability.

Analysis: she would calculate the percentage of customers who disobeyed each sign

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and the mean number of disobedient acts per hour, comparing busy and quiet times and age groups in a bar chart. No customers would be identified, so data stay anonymous.

..... [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.

Weakness: when the shop is busy Kimberley cannot see every customer at once, so she may miss acts of touching or eating, especially out of her line of sight, and the tallies would underestimate disobedience, reducing validity. Improvement: Kimberley could use the shop's CCTV to record the sessions and then code the video later, pausing and replaying it, with two observers each coding the footage of one area of the shop so that every customer's behaviour is recorded accurately.

..... [4]

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