Cambridge Assessment International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/41**

Paper 4 Specialist Options: Application and Research Methods **May/June 2025**

1 hour 30 minutes

3037591681

You must answer on the enclosed answer booklet.

You will need: Answer booklet (enclosed)

INSTRUCTIONS

- Answer **five** questions in total:
  - Answer questions from **two** options.
    - Section A: answer **four** questions.
    - Section B: answer **one** question.
- Follow the instructions on the front cover of the answer booklet. If you need additional answer paper, ask the invigilator for a continuation booklet.

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 **8** pages. Any blank pages are indicated.

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Section A

Answer questions from **two** options in this section.

Clinical Psychology

Answer **all** questions if you have studied this option.

1 The key study by Chapman and DeLapp (2013) on blood/injection/injury phobia used the subjective unit of discomfort scale (SUDS) to assess the change in the anxiety levels of the patient 'T'.

(a) **(i)** Identify **two** situations included in the SUDS hierarchy used with 'T', other than 'getting a phlebotomy'. [2]

(ii) Give the results for **one** situation of the SUDS hierarchy identified in part **(a)** that show a change in the anxiety levels of 'T'. [2]

(b) Suggest **one** reason why the data gathered from 'T' might **not** be valid. [2]

(c) Explain **two** strengths of using quantitative data to assess the effectiveness of blood/injection/injury anxiety measures. [4]

2 Ellis developed rational emotive behaviour therapy (REBT) for the treatment of mood (affective) disorders.

(a) Outline how irrational beliefs are changed by REBT. [2]

(b) Suggest how the effectiveness of REBT could be measured using a questionnaire. [2]

(c) Explain **two** strengths of using REBT to treat depression. [4]

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Consumer Psychology

Answer **all** questions if you have studied this option.

3 From the key study by Robson et al. (2011) on consumers' responses to table spacing:

(a) **(i)** Participants were asked 'how you would feel about being seated at this table'. One of the questions that the participants then had to rate on the questionnaire was 'I would be overheard by other diners'.

Give **two** other questions that the participants were asked to rate. [2]

(ii) Outline the type of rating scale used by participants to answer these questions. [2]

(b) Suggest **one** way to collect data about the effect of table spacing in restaurants, other than using an online questionnaire with closed questions. [2]

(c) Explain **one** strength and **one** weakness of using rating scales to assess consumers' responses to table spacing. [4]

4 **(a)** Outline what is meant by brand awareness. [2]

(b) Suggest **one** way in which brand awareness could be measured, other than a rating scale. [2]

(c) Explain **one** strength and **one** weakness of the measurement you suggested in part **(b)**. [4]

Health Psychology

Answer **all** questions if you have studied this option.

5 From the key study on positive psychology in schools by Shoshani and Steinmetz (2014):

(a) **(i)** Identify **two** features of the sample used in this study. [2]

(ii) Give the **two** reasons why some participants withdrew from the study. [2]

(b) The study included a 'wait-list control condition'.

Suggest **one** reason for including this 'wait-list control condition'. [2]

(c) Explain **one** strength and **one** weakness of using longitudinal studies to investigate positive psychology in schools. [4]

6 **(a)** Identify **two** behavioural categories included in the UAB pain behaviour scale. [2]

(b) Suggest **one** way in which acute pain can be managed using a psychological treatment. [2]

(c) Explain **two** weaknesses of pain measures that use observation to collect data. [4]

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Organisational Psychology

Answer **all** questions if you have studied this option.

7 From the key study on reasons for sabotage in the workplace by Giacalone and Rosenfeld (1987):

(a) **(i)** 'Subjects were told that they should not write their names or any identifying information on the questionnaires.'

Outline why this was necessary in this study. [2]

(ii) 'Each subject was also advised that the questionnaires were being used for an industrial psychology seminar and that management would not have access to the responses.'

Outline why this was necessary in this study. [2]

(b) The questionnaires used in the study were constructed by an employee who had recently resigned.

Suggest **one** reason why an employee who had recently resigned was chosen to help construct the questionnaires. [2]

(c) Explain **two** reasons why generalisations **cannot** be made about sabotage from one study. [4]

8 **(a)** Explain what is meant by an 'error of commission' when investigating accidents at work. [2]

(b) Suggest **one** way in which an error of commission could be reduced. [2]

(c) Explain **two** weaknesses when gathering data about accidents at work. [4]

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Section B

Answer **one** question from this section.

Clinical Psychology

9 **(a)** Plan a study using a postal questionnaire to investigate attributional styles in adults with depression.

Your plan must include details about:
- type(s) of data
- sampling technique. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of type(s) of data. [2]

(ii) Explain **one** weakness of the use of a postal questionnaire in your study. [2]

(iii) Explain **one** reason for your choice of sampling technique. [2]

Consumer Psychology

10 **(a)** Plan a study using a field experiment to investigate the effect of food name on menu item choice.

Your plan must include details about:
- type(s) of data
- dependent variable. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your experiment. [4]

(c) **(i)** Explain **one** reason for your choice of type(s) of data. [2]

(ii) Explain **one** weakness of your choice of type(s) of data. [2]

(iii) Explain **one** reason for your choice of dependent variable. [2]

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Health Psychology

11 **(a)** Plan a study using a face-to-face interview to investigate the effectiveness of stimulation therapy/TENS for managing acute pain.

Your plan must include details about
- interview format
- sampling technique. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of interview format. [2]

(ii) Explain **one** weakness with conducting a face-to-face interview in your study. [2]

(iii) Explain **one** reason for your choice of sampling technique. [2]

Organisational Psychology

12 **(a)** Plan a study using an interview to investigate the effects of rapid rotation shiftwork on the health of workers.

Your plan must include details about:
- question scoring/interpretation
- interview format. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of question scoring/interpretation. [2]

(ii) Explain **one** weakness of your choice of question scoring/interpretation. [2]

(iii) Explain **one** reason for your choice of interview format. [2]

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Surname	StemUp Model Solution
Answer booklet	Write the question number in the left-hand margin at the start of each answer.

Question number

Answers for paper 9990/41

Section A: Clinical Psychology

1(a)(i) Taking blood pressure myself.

Wife taking my blood sugar.

1(a)(ii) Taking blood pressure myself: before treatment T rated this situation at 75 on the SUDS. During the exposure session his rating fell from 55 to 45 to 35, and after treatment it was only 20, so his anxiety had clearly decreased.

1(b) T may have been affected by social desirability or demand characteristics. He knew the therapist wanted the therapy to work, so he may have given lower SUDS ratings than the anxiety he really felt, so the scores would not accurately measure his true level of discomfort.

1(c) One strength is that quantitative data, such as a SUDS rating from 0 to 100, is objective and unambiguous. This lets the therapist make a precise judgement about the patient's current level of anxiety, e.g. that T's anxiety about a tourniquet fell from 45 to 15, rather than relying on vague descriptions like "a bit better".

A second strength is that the measure can be repeated many times in exactly the same way, before, during and after therapy. This means progress, or lack of progress, in the blood phobic patient can be tracked and compared session by session, and the scores can be shown on a graph or compared with other blood phobic patients, which is not easy with qualitative data.

Question number	
2(a)	Ellis said an activating event (A) leads to an irrational belief (B), which causes the emotional and behavioural consequences (C), e.g. depression. In REBT the therapist Disputes (D) the irrational belief, challenging it logically and empirically (e.g. "where is the evidence that you are a total failure?"), so the patient replaces it with a rational belief. The Effect (E) is a new, healthier emotional response to the event.
2(b)	The patient could complete a questionnaire of closed questions before and after the course of REBT, rating statements such as "When something goes wrong I tell myself it is a disaster" on a 5-point scale from strongly agree to strongly disagree. A fall in the total score for irrational beliefs after therapy would show that disputing had been effective.
2(c)	One strength is that once learned, REBT can be used by the patient anywhere and at any time without the therapist. When the depressed patient meets a new activating event, such as being criticised at work, they can dispute their own irrational belief themselves, so the benefits continue after therapy ends and relapse is less likely than when drugs are stopped. A second strength is that research supports its effectiveness. Lyons and Woods (1991) reviewed many studies and found that REBT produced significant improvement compared with control groups. Iftene et al. (2015) found REBT was as effective as antidepressant medication, but without the side effects of drugs, which makes it a more ethical choice for many patients.
	Section A: Consumer Psychology
3(a)(i)	Sitting at this table, I would feel like the restaurant cares about me.

Question number	
	Sitting at this table, I would disturb the next table if I had to get up.
3(a)(ii)	A Likert-type rating scale with seven points, from 1 = strongly disagree, through 4 = neither agree nor disagree, to 7 = strongly agree.
3(b)	A covert observation could be carried out in a real restaurant, using behavioural categories such as leaning away from the next table, lowering voices, and time spent at the table. Observers would tally these for diners seated at tables placed 6, 12 or 24 inches apart.
3(c)	A strength is that the rating scale gives every participant the same fixed responses, so the answers are quick to give and easy to analyse. The researchers could calculate a mean rating for "I would feel exposed" at each table spacing and compare them directly, which would be much harder with qualitative descriptions. A weakness is that the scale only produces quantitative data, so participants cannot explain why they gave a rating. For example, a woman who strongly agrees that she would feel watched cannot say whether this is because of the diners at the next table or the view of the room, so the reasons for the effect of table spacing are not known.
4(a)	Brand awareness is the extent to which consumers are familiar with a brand's identity and its products, e.g. from its name, logo or slogan. It is shown by brand recall (remembering the brand without help) and brand recognition (identifying it from a list or array).
4(b)	A brand recognition task in a structured interview: participants are shown 20 logos with the brand names removed, one at a time, and asked to name the brand. The number of brands correctly identified out of 20 is the brand awareness score.

Question number	
4(c)	A strength is that the logo task gives objective quantitative data. Each participant scores, for example, 14 out of 20, so brand awareness for each logo can be compared as a percentage, e.g. 90% recognised one brand but only 30% recognised another, and these scores can be statistically analysed. A weakness is that recognising a logo in an interview lacks ecological validity. A participant may recognise a logo when it is shown clearly on a card, but in a real supermarket, with many competing brands on a shelf, they may not notice it at all, so the task may overestimate how aware consumers really are of the brand when shopping.
	Section A: Health Psychology
5(a)(i)	1167 students at the start of the study. Students in the seventh, eighth and ninth grades from two large middle schools in the centre of Israel.
5(a)(ii)	Some students were absent from school. Some students refused to complete the questionnaires.
5(b)	The wait-list control school acts as a baseline. Its students continued with their regular social science lessons, so any change in the intervention school's scores could be compared with it to show that the positive psychology programme, and not just growing older, caused the improvement.
5(c)	A strength is that a longitudinal study can test whether what was taught stays with students over time. Measuring the same students at several points showed whether the benefits of the positive psychology lessons, such as higher

Question number	
	self-esteem and lower anxiety, lasted beyond the end of the programme rather than being a short-lived effect. A weakness is that young adolescents change a lot as they grow and are influenced by other events over the months, such as moving to a different type of school which may not promote the same values, family changes or friendships. So it is hard to be sure that later changes in well-being were caused by the programme. Some students also drop out over time, which may bias the final sample.
6(a)	Facial grimaces. Body language, such as clutching or rubbing the painful site.
6(b)	Attention diversion: the patient focuses on something other than the pain, such as counting backwards in 3s or watching a video, while having an injection at the dentist. Less attention is given to the acute pain, so it is felt less strongly.
6(c)	One weakness is that the observer may misinterpret the patient's pain behaviour. A patient who grimaces or rubs a joint may be tired or anxious rather than in severe pain, and an incorrect interpretation could lead to too much or too little pain medication being prescribed. A second weakness is that the observer does not ask the person about their pain and is not experiencing it themselves. Pain is subjective, so a stoical patient who shows few pain behaviours may be in a lot of pain, and the observer misses essential detail, such as whether the patient feels the pain is easing.
	Section A: Organisational Psychology
7(a)(i)	This kept the participants anonymous (confidentiality), so management could not

Question number	
	identify which worker admitted to sabotage and punish them, e.g. by telling them off, demoting them or sacking them.
7(a)(ii)	This was a deception so participants would not know the real purpose of the study and would feel safe. Otherwise they might not have been honest about why sabotage is committed, and the data would not have been valid.
7(b)	The ex-employee knew the company and the ways in which workers there had committed sabotage. As they would not be returning to the company, they had no reason to hide anything, so they could give more honest insight into reasons for sabotage than any other source.
7(c)	First, what counts as sabotage may differ from one company to another. Giacalone and Rosenfeld based their list of reasons on one company's workers, so other organisations may define sabotage differently and workers there may justify it for different reasons. Second, the work and work tools differ between industries. This study was carried out in an electrical factory, so ways of sabotaging machinery there are very different from sabotage in an office, a hospital or a school. It was also done in one country, the USA, and workers in other cultures may see sabotage very differently, so the findings cannot be generalised.
8(a)	An error of commission is when a worker performs an action that is incorrect or inappropriate, misapplying the standard procedure. For example, in the Kegworth air crash, the pilots shut down the working engine instead of the faulty one, causing the plane to crash.
8(b)	Design the system to fit the operator: controls for different actions should look

Question number	
	and feel different and be clearly labelled, with visual displays and audio warnings that tell the operator immediately when they have selected the wrong control, so the incorrect action can be noticed and stopped.
8(c)	One weakness is that the worker involved may not tell the truth. They may exaggerate or play down details of what happened, or fear that they will lose their job if they admit their error, so the account of the accident is inaccurate and wrong conclusions are drawn about its cause. A second weakness is that the worker, the company and health and safety authorities may define an "accident" differently. A near miss or minor injury may not be counted as an accident at all, so it is never reported, and the data underestimates how often errors happen.
	Section B: Clinical Psychology
9(a)	Aim: to investigate the attributional styles of adults with depression. Hypothesis: adults with depression will make more internal, stable and global attributions for bad events than adults without depression. Sampling technique: a volunteer sample. Letters will be sent via three local GP surgeries and a mental health charity asking adults (18 to 65) who have been diagnosed with depression, and adults with no history of depression, to volunteer. I will aim for 60 in each group. Technique: a postal questionnaire, sent to each volunteer's home with a stamped addressed envelope to return it, so there is no cost to the participant. It is based on the Attributional Style Questionnaire: 12 hypothetical events (6 good, 6 bad), e.g. "You go out on a date and it goes badly". For each event there is one open question: "Write down the one major cause of this event", then three closed questions on 7-point rating scales: "Is the cause due to you (7) or to other people

Question number	
	or circumstances (I)?" (internal), "Will this cause be present again in the future?" (stable) and "Does this cause affect just this situation or all areas of your life?" (global). Types of data: quantitative data from the rating scales; for each participant a mean score from 1 to 7 is calculated for internal, stable and global attributions for bad events. Means and standard deviations will be compared for the two groups and shown in a bar chart. Qualitative data from the open question will be content analysed by two independent raters to check inter-rater reliability. Reliability and validity: the questionnaire is standardised, with the same instructions and question order for everyone, and some items are reverse-scored to reduce response bias. Ethics: an information sheet gives informed consent, and returning the questionnaire shows consent. No names are written on the questionnaire, so data is confidential, and participants are told they can withdraw by not returning it. A debrief letter with helpline numbers is sent afterwards, as the questions may cause distress.
9(b)(i)	Seligman et al. (1988) extended learned helplessness to explain why people respond differently to bad events. A person's attributional style determines whether they become depressed. If someone makes an internal attribution (it is my fault), a stable attribution (it will always be like this) and a global attribution (it will affect everything I do), they are likely to feel helpless and become depressed. If they make external, unstable and specific attributions, helplessness and depression are unlikely. Attributional style can be measured with the Attributional Style Questionnaire, which uses hypothetical good and bad events with rating scales for each dimension.
9(b)(ii)	First, I used the three dimensions of attributional style (internal, stable, global).

Question number	
	This was modified into three 7-point rating scale questions after each event in my postal questionnaire, so each participant got a score for each dimension and I could test whether depressed adults score higher. Second, I used the idea of hypothetical good and bad events from the Attributional Style Questionnaire. My questionnaire contained 6 good and 6 bad events, so I could compare depressed and non-depressed adults' attributions for bad events with their attributions for good events.
9(c)(i)	I chose quantitative data because the 7-point ratings can be turned into a mean score for internal, stable and global attributions, so the depressed and non-depressed groups can be compared directly and statistically.
9(c)(ii)	Postal questionnaires may be treated like junk mail, or started and then forgotten. Adults with depression often lack motivation and energy, so many may not return it, giving a low response rate and a biased sample.
9(c)(iii)	A volunteer sample was chosen because people who volunteer are willing and more likely to complete and return the postal questionnaire. This matters with a sensitive topic like depression, where people must agree to share their thoughts.
	Section B: Consumer Psychology
10(a)	Aim: to investigate the effect of descriptive food names on menu item choice. Hypothesis: more customers will choose a dish when it has a descriptive name (e.g. "Tender golden roast chicken") than when it has a plain name ("Roast chicken"). Type of experiment: a field experiment in a real mid-price family restaurant, so customers order as normal.

Question number	
	IV: the menu wording. Condition A: four target dishes have plain names; condition B: the same four dishes have descriptive names using words such as tender, golden, natural and homemade. The rest of the menu, prices, layout and position of the target dishes stay the same. Design: independent measures. Menu A is used on four weeks and menu B on four other weeks, alternated so the days of the week are balanced. Dependent variable: the number of each of the four target dishes ordered per 100 main courses sold, taken from the till records. Waiting staff will not be told the hypothesis, so they do not influence choices, and specials will not be offered. Sample: an opportunity sample of all adult customers dining over the eight weeks (about 2000 diners). Types of data: quantitative data (number of target dishes ordered) shown as percentages and a bar chart comparing menu A and B. In addition, qualitative data: a short card with the bill asks "What made you choose your main course?" and answers are put into categories by two raters. Ethics: the manager gives consent; diners are not identified, so data is confidential. Diners are not harmed as they choose freely. Those who fill in the card are told about the study on it and can choose not to hand it in, which withdraws their data.
10(b)(i)	Lockyer (2006) investigated how words on a restaurant menu affect menu item choice. First, four focus groups discussed five menus with the same items but different wording. The occasion and the people dining affected choice, and diners wanted items they would not normally make at home. Descriptive words had a "mouth-watering" effect and were strong persuaders. A survey based on the focus groups confirmed the positive effect of descriptive words such as "tender", "golden" and "natural" on choosing menu items.

Question number	
10(b)(ii)	First, I used Lockyer's idea that the same dishes can be described with different wording. I modified this from focus group menus into a real restaurant menu, with the same four dishes given plain names on menu A and descriptive names on menu B as my IV. Second, I used the descriptive words "tender", "golden" and "natural" that Lockyer found to be persuasive in the names of my target dishes, and measured actual orders rather than opinions to see if they really increase choice.
10(c)(i)	Quantitative data was chosen because counting the number of target dishes ordered per 100 main courses lets me compare menu A and menu B directly with percentages and statistical tests.
10(c)(ii)	Quantitative data only shows how many diners ordered each dish, not why. A diner may choose the "tender golden roast chicken" because they always order chicken, not because of the name, and the number does not reveal this.
10(c)(iii)	The number of target dishes ordered per 100 main courses was chosen because it is an objective, operationalised measure of choice taken from till records, allowing the menus to be compared fairly even if different numbers of people dined in each week.
	Section B: Health Psychology
11(a)	Aim: to investigate how effective TENS is for managing acute pain. Hypothesis: patients using TENS will report lower pain after treatment than before. Sample: a volunteer sample of 30 adults attending a hospital physiotherapy clinic for acute pain, e.g. a recent back or knee sprain, who are offered TENS. A poster in the clinic waiting room asks for volunteers.

Question number	
	Interview technique: face-to-face in a quiet private room at the clinic, after the patient's first week of using TENS. Interview format: a semi-structured interview. Every participant is asked the same 10 fixed questions in the same order, and the interviewer can ask follow-up questions. Closed questions include: "On a scale of 0 (no pain) to 10 (worst pain imaginable), how bad was your pain before using TENS?", "...and how bad is it after using TENS?", and "How often did you use the TENS machine each day?". Open questions include: "Describe how the pain felt while the TENS machine was on" and "Would you use TENS again? Why?". Scoring and analysis: the 0 to 10 ratings give quantitative data; the mean pain rating before and after TENS is calculated and shown in a bar chart. Answers to open questions are recorded with permission and analysed by two researchers into themes such as "distraction" and "tingling", to check inter-rater reliability. Controls: the same trained interviewer uses a standard script and neutral tone to reduce interviewer bias. Ethics: written informed consent is gained. Participants are told they can stop the interview and withdraw their data at any time, names are replaced with numbers for confidentiality, and the interview does not affect their treatment. They are debriefed at the end.
11(b)(i)	Stimulation therapy is a form of counter-irritation. A mild pain or sensation is applied to distract attention from the stronger pain. One example is transcutaneous electrical nerve stimulation (TENS), which is self-administered. Electrodes are placed on the skin near where the patient feels pain and the device gives mild electrical pulses, producing a tingling feeling that distracts from the pain. TENS is thought to increase the release of endorphins, the body's natural painkillers, and to reduce excitation of neurons in the spinal cord, so fewer pain signals reach the brain.

Question number	
11(b)(ii)	First, TENS is self-administered by the patient. I used this by interviewing patients after a week of using the machine themselves, and asked how often they used it each day, as the amount of use may affect pain relief. Second, TENS works by distracting attention with a tingling sensation. I modified this into an open question, "Describe how the pain felt while the TENS machine was on", so I could find out whether patients noticed the tingling more than the pain.
11(c)(i)	A semi-structured interview was used because every patient is asked the same fixed questions, such as the 0 to 10 pain ratings, so answers can be compared, but the interviewer can also follow up interesting answers about how TENS felt.
11(c)(ii)	Because the interviewer can see the patient face-to-face, patients may not be truthful. They may say TENS reduced their pain more than it did, to please the interviewer or the clinic staff, so the data is less valid.
11(c)(iii)	A volunteer sample was chosen because patients in acute pain must be willing to give up time for a face-to-face interview, and volunteers are more likely to take part and answer all ten questions fully.
	Section B: Organisational Psychology
12(a)	Aim: to investigate the effects of rapid rotation shiftwork on the health of workers. Hypothesis: workers on rapid rotation shifts will report more health problems than day workers. Sample: an opportunity sample of 40 factory workers on a rapid rotation rota (e.g. 2 early, 2 late, 2 night, 2 rest) and 40 day workers from the same company.

Question number	
	Interview technique and format: a face-to-face structured interview in a private room at the factory, during work time. Every participant is asked the same 12 questions in the same order by the same interviewer, who reads them from a script. Example questions: "Which shift rota do you work?"; "Have you been diagnosed with or treated for a stomach ulcer or digestive problem in the last 2 years? yes/no"; "How many days have you been off sick in the last 6 months?"; "How often do you feel tired at work?" (never/rarely/sometimes/often/always); and one open question: "How do you think your shift pattern affects your health?". Question scoring/interpretation: yes/no answers are counted; the frequency scale is scored 1 (never) to 5 (always), so each worker gets a total health problem score. Means for the two groups are compared and shown in a bar chart. Answers to the open question are written down and coded into categories (e.g. sleep problems, digestive problems) by two independent raters, and their agreement is checked for reliability. Ethics: informed consent is gained, workers are told they can withdraw at any time, and names are not recorded so management cannot see individual answers. Participants are debriefed and given details of the occupational health service.
12(b)(i)	Rapid rotation shiftwork means workers change shift every few days. The metropolitan rota is 2 early (6 am to 2 pm), 2 late (2 pm to 10 pm), 2 night (10 pm to 6 am) and 2 rest days. The continental rota is 2 early, 2 late, 3 night, 2 rest, then 2 early, 3 late, 2 night, 2 rest and so on. Knutsson (2003) reviewed research and found shiftwork is associated with specific disorders, especially peptic ulcer disease, coronary heart disease and poor pregnancy outcomes. Gastrointestinal disorders are more common in shift workers than day workers, but there is no evidence that shiftwork affects mortality or cancer.

Question number	
12(b)(ii)	First, I used the description of rapid rotation rotas. Participants are asked "Which shift rota do you work?", so I can check they are on a rota like the metropolitan one and compare them with day workers. Second, I used Knutsson's finding that peptic ulcers and gastrointestinal disorders are more common in shift workers. I turned this into the yes/no question about being diagnosed or treated for a stomach ulcer or digestive problem.
12(c)(i)	The yes/no and 1 to 5 frequency questions were scored so that every worker's answers can be compared, giving a total health score, so the mean for rapid rotation workers can be compared statistically with day workers.
12(c)(ii)	The 5-point scale has a neutral middle option, "sometimes". Many workers may choose it for "How often do you feel tired at work?" to avoid seeming unable to cope, so differences between shift and day workers are hidden.
12(c)(iii)	A structured interview was used so that all workers received the same questions in the same order, from the same script, so differences in answers are due to their shift pattern, not to the interviewer.

Cambridge Assessment International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/42**

Paper 4 Specialist Options: Application and Research Methods **May/June 2025**

1 hour 30 minutes

7381141984

You must answer on the enclosed answer booklet.

You will need: Answer booklet (enclosed)

INSTRUCTIONS

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Section A

Answer questions from **two** options in this section.

Clinical Psychology

Answer **all** questions if you have studied this option.

1 In the key study by Freeman et al. (2003) using virtual reality (VR) to investigate persecutory ideation, comments were made by the participants about the avatars.

(a) Give **one** positive and **one** negative comment made by the participants about the avatars. [4]

(b) Suggest how the comments about avatars could be analysed. [2]

(c) Explain **one** strength and **one** weakness of collecting qualitative data in this study. [4]

2 Obsessive-compulsive disorder (OCD) can be measured using psychometric tests such as the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS).

(a) Outline the scale used to assess question items on the Y-BOCS. [2]

(b) Suggest **one** way that the reliability of the Y-BOCS could be tested. [2]

(c) Explain **one** strength and **one** weakness of using psychometric tests to measure OCD. [4]

Consumer Psychology

Answer **all** questions if you have studied this option.

3 The key study by North et al. (2003) expected participants to spend more money in the classical music condition than in the pop music condition.

(a) **(i)** State what was found about total spend across the three conditions of the independent variable. [2]

(ii) State what was found about spending on wine. [2]

(b) Suggest **one** way the effect of classical music on behaviour in a restaurant could be investigated, other than by spending money. [2]

(c) Give **two** reasons why generalisations **cannot** be made about musical style and restaurant customers' spending from one study. [4]

4 **(a)** Explain what is meant by the term 'wayfinding' when in a shopping mall. [2]

(b) Suggest how wayfinding could be investigated, other than in a shopping mall. [2]

(c) Explain **two** strengths of conducting research on wayfinding in shopping malls. [4]

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Health Psychology

Answer **all** questions if you have studied this option.

5 From the key study by Yokley and Glenwick (1984) on improving medical adherence using community interventions:

(a) Outline **two** dependent variables (dependent measures) recorded by Yokley and Glenwick. [4]

(b) Suggest **one** way that parents could receive information about the importance of inoculations for their children, other than by post or telephone. [2]

(c) Explain **two** strengths of gathering objective data on inoculation adherence. [4]

6 **(a)** Outline what is meant by a visual analogue scale to measure pain. [2]

(b) Suggest **one** way the validity of a visual analogue scale could be tested. [2]

(c) Explain **two** strengths of using a visual analogue scale to measure acute pain. [4]

Organisational Psychology

Answer **all** questions if you have studied this option.

7 From the key study by Claypoole and Szalma (2019) on electronic performance monitoring:

(a) **(i)** Outline **two** features of the sample used in this study. [2]

(ii) Outline how participants were recruited for this study. [2]

(b) Suggest the effect that an alternative location could have had on the results of this study. [2]

(c) Explain **two** strengths of the use of random allocation in this study. [4]

8 **(a)** Outline what is meant by the term ‘social loafing’, using an example from any organisation. [2]

(b) Suggest **one** way that social loafing can be reduced in a meeting in an organisation. [2]

(c) Explain **two** strengths of studying social loafing in a work environment. [4]

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Section B

Answer **one** question from this section.

Clinical Psychology

9 **(a)** Plan a study using an observation to investigate which type of compulsion is **most** common in people diagnosed with obsessive-compulsive disorder (OCD).

Your plan must include details about:
- structured observation or unstructured observation
- type(s) of data. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of structured observation or unstructured observation. [2]

(ii) Explain **one** weakness of your choice of structured observation or unstructured observation. [2]

(iii) Explain **one** reason for your choice of type(s) of data. [2]

Consumer Psychology

10 **(a)** Plan a study using an interview to investigate the effect of background noise on the taste of food eaten at an outdoor market.

Your plan must include details about:
- interview format
- sampling technique. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of interview format. [2]

(ii) Explain **one** weakness of your choice of interview format. [2]

(iii) Explain **one** reason for your choice of sampling technique. [2]

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Health Psychology

11 **(a)** Plan a study using an online questionnaire to investigate differences between adult males and adult females in rational non-adherence to medical advice.

Your plan must include details about:
- closed questions
- sampling technique. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of closed questions. [2]

(ii) Explain **one** weakness of your choice of closed questions. [2]

(iii) Explain **one** reason for your choice of sampling technique. [2]

Organisational Psychology

12 **(a)** Plan an experiment to investigate the effectiveness of a reward system to reduce the number of accidents in a factory where clothes are made.

Your plan must include details about:
- experimental design
- type of experiment. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your experiment. [4]

(c) **(i)** Explain **one** reason for your choice of experimental design. [2]

(ii) Explain **one** weakness of your choice of experimental design. [2]

(iii) Explain **one** reason for your choice of type of experiment. [2]

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Surname	StemUp Model Solution
Answer booklet	Write the question number in the left-hand margin at the start of each answer.

Question number

Answers for paper 9990/42

Section A: Clinical Psychology

1(a) Positive: "It was nice when they smiled, made me feel welcome."

Negative: "Sometimes appeared hostile, sometimes rude."

1(b) Content analysis: a panel of judges decides categories, e.g. friendly, neutral and hostile, then each comment made about the avatars is allocated to a category and tallied, so the number of each type of comment can be compared with percentages.

1(c) A strength is that qualitative data lets participants express their own views in their own words rather than just giving a number. Comments such as "I smiled and chuckled" or "They were telling me to go away" show how each person interpreted the neutral avatars, including persecutory thoughts the researchers may not have thought to ask about.

A weakness is that qualitative data is hard to compare between participants. Positive and negative comments about the avatars are all worded differently, so judges have to interpret their meaning, and without this the conclusions about persecutory ideation could be ambiguous or biased by one researcher's views.

2(a) Each item is rated on a 5-point scale from 0 to 4, with verbal labels from none (0), through mild, moderate and severe, to extreme (4).

Question number	
2(b)	Test-retest reliability: the Y-BOCS is given to the same patients with OCD on two occasions, e.g. two weeks apart with no treatment in between, and the two sets of scores are correlated. A strong positive correlation shows the Y-BOCS is reliable.
2(c)	A strength is that psychometric tests produce quantitative data, which allows comparisons between people and for the same person over time. For example, the total Y-BOCS score, including time spent on compulsions each day, can be compared before and after treatment to show whether a patient's OCD has improved. A weakness is that psychometric tests do not take into account individual differences. Every patient answers the same fixed items, so the test does not let a person express their feelings about their own specific rituals, such as why they check a door a certain number of times, so important detail about their OCD is lost.
	Section A: Consumer Psychology
3(a)(i)	Total spend was highest when classical music was played (about £32.51 per person). It was lowest with pop music (about £29.46), with no music in the middle (about £29.73).
3(a)(ii)	Spending on wine was greatest in the no music condition (£5.05 per person), compared with the classical music and pop music conditions.
3(b)	Observe how long, in minutes, each table of diners stays in the restaurant from arriving to leaving, and compare the mean time spent in the classical, pop and no music conditions.

Question number	
3(c)	First, one restaurant is not typical of all restaurants. North et al. used a relatively up-market restaurant in rural Leicestershire, so diners there may already like classical music, and the effect may not be found in a fast food restaurant or a city cafe. Second, classical and pop music do not represent all the types of music played in restaurants. The findings cannot tell us whether jazz or traditional music would increase spending, and in a different location or culture the same styles might have the opposite effect.
4(a)	Wayfinding is the ability to know where we are and to plan and follow a route to where we want to go, e.g. finding a particular shop in a shopping mall using signs and "you are here" maps.
4(b)	A field experiment in a hedge maze: participants are asked to find their way to the centre as quickly as possible, half with a "you are here" map and half without, and the time taken is recorded.
4(c)	One strength is that the mall is where people actually shop, so it is the best place to study real wayfinding and to ask shoppers about the mall they are in. This gives high ecological validity, as their behaviour is natural rather than in an artificial laboratory task. A second strength is that information can be gathered about how well the existing signs and "you are here" maps work. If shoppers find a mall difficult to navigate, the signage can be improved and future malls can be designed to make wayfinding easier, which is useful for mall owners.
	Section A: Health Psychology

Question number	
5(a)	The number of target children receiving one or more inoculations at the clinic during the study. The number of target children attending the clinic for any reason, not only for inoculations.
5(b)	By email: parents could be sent an email from their child's doctor explaining which vaccinations the child is due for, why they matter, and when and where the free clinic is held.
5(c)	One strength is that objective data is fact. The number of children receiving inoculations at the clinic is taken from clinic records, so it is unambiguous: a child has either been vaccinated or not. It is not affected by parents giving socially desirable answers about their adherence. A second strength is that objective data lends itself to quantitative analysis. Records can be compared over time and between conditions, e.g. before and after a reminder, so researchers can see patterns and trends in inoculation uptake and judge which intervention is most effective.
6(a)	A visual analogue scale measures pain on a continuum, usually a 10 cm line from "no pain" at one end to "worst pain imaginable" at the other. The patient marks the point on the line that best represents their pain.
6(b)	Criterion validity: patients complete the VAS and another established measure of pain, such as the McGill Pain Questionnaire, at the same time. If the two scores show a strong positive correlation, the VAS is valid.
6(c)	One strength is that it collects quantitative data, so pain can be compared and analysed. A patient with a broken arm can mark their pain on arrival at hospital

Question number	
	and again after painkillers, and the distance along the line shows exactly how much the pain has reduced. A second strength is that it is quick and simple. A patient in severe acute pain, e.g. after a burn, can just make one mark or point to the line, rather than answer many questions, and it can be used with children or people with limited language. With a 0 to 100 line it is sensitive to small changes in pain.
	Section A: Organisational Psychology
7(a)(i)	There were 106 participants (65 female, 41 male). All were undergraduate students, with an average age of 20.57 years.
7(a)(ii)	They were recruited through a psychology experiment website at a large university in the south-eastern United States, and received course credit for completing the study.
7(b)	The study was in a university laboratory. If it had been carried out in a real organisation, where workers' jobs depend on being monitored, the effect of electronic performance monitoring on performance and stress could have been stronger, increasing ecological validity, but extraneous variables such as noise would be less controlled.
7(c)	One strength is that it removes participant bias. Participants do not choose which condition they are in, so people who are more confident or less worried about being watched cannot all end up in the electronic performance monitoring condition, and differences in performance are more likely to be due to the monitoring. A second strength is that it removes experimenter bias. The researcher does not decide who goes into the monitoring or control condition, so they cannot, even

Question number	
	unconsciously, put the most able students into one condition, which increases the validity of the conclusions.
8(a)	Social loafing is the decrease in individual effort when people work in a group compared with when they work alone. For example, in an online meeting of 50 staff, some turn off their cameras and do other work, leaving a few people to come up with all the ideas.
8(b)	The manager could assign each person a specific task before the meeting, e.g. to present one idea or report on one part of the project, so everyone is individually accountable and their contribution is visible.
8(c)	One strength is that studying social loafing at work can identify which individuals are not pulling their weight. They can then be retrained or given individual targets, which makes the work environment more productive and efficient and is positive for management and the organisation. A second strength is that if social loafing is reduced, every team member can be confident that others are doing their share. This reduces resentment among hard-working staff and can create a more cohesive group, increasing group performance. Studying it in a real workplace also gives high ecological validity.
	Section B: Clinical Psychology
9(a)	Aim: to find out which type of compulsion is most common in people diagnosed with OCD. Hypothesis: checking compulsions will be observed more often than other types. Sample: a volunteer sample of 20 adults diagnosed with OCD, recruited through an OCD charity and two outpatient clinics, who agree to be observed at home.

Question number	
	Observation: a structured, overt, non-participant, naturalistic observation in each participant's own home, for two hours in the morning and two in the evening (when getting ready and before bed), recorded on a fixed video camera so the observer does not have to be present.
	Behavioural categories: (1) washing, e.g. washing hands or showering repeatedly; (2) cleaning objects; (3) checking, e.g. locks, switches, taps; (4) counting, ordering or arranging items; (5) hoarding, keeping unneeded items; (6) other ritual acts, e.g. touching or tapping. Each category is defined in an observer manual.
	Sampling: event sampling, so each time a compulsive act occurs it is tallied in the correct category. Time spent on each act is also recorded.
	Types of data: quantitative data, the frequency of each compulsion per participant and the total for the group, shown as a bar chart and percentages and the mode (most common compulsion).
	Reliability: two trained observers code the same videos independently and their tallies are correlated to check inter-rater reliability. A pilot study with two volunteers tests the categories first.
	Ethics: informed consent is gained; participants know when the camera is on and can turn it off or withdraw at any time. Videos are stored securely, only seen by the researchers, and deleted after coding, and participants are identified by number. They are debriefed and given details of support services.
9(b)(i)	ICD-11 describes OCD as having obsessions and/or compulsions. Compulsions are repetitive behaviours or mental acts that the person feels driven to perform in response to an obsession, to reduce anxiety. Common types are washing (e.g. excessive hand washing), cleaning, checking (e.g. that doors are locked or switches are off), counting, ordering or arranging possessions, and hoarding. Rapoport (1989) described "Charles", a teenage boy with OCD whose compulsion was

Question number	
	ritualised washing: he washed for hours every day following a set routine, which disrupted his life and schooling.
9(b)(ii)	First, I used the ICD-11 types of compulsion. I turned washing, cleaning, checking, counting/ordering and hoarding into the behavioural categories on my checklist, so observers could tally each type and find the most common. Second, I used the case of Charles, whose washing took up hours each day. This is why I recorded time spent on each act as well as frequency, and observed at home in the morning and evening, when washing rituals are likely.
9(c)(i)	A structured observation uses a checklist of defined categories, so observers know exactly what to record. Two observers can tally checking, washing, etc. independently and their reliability can be checked.
9(c)(ii)	A structured observation may not include every category needed. A participant may perform a mental compulsion, such as silently repeating a phrase, which cannot be seen and has no category, so it is not recorded.
9(c)(iii)	Quantitative data was chosen because counting the frequency of each compulsion lets me calculate totals and percentages and directly identify which compulsion is the most common across the 20 participants.
	Section B: Consumer Psychology
10(a)	Aim: to investigate the effect of background noise on the taste of food eaten at an outdoor market. Hypothesis: people eating in loud noise will rate food as less sweet and less salty, but more crunchy, than people eating in quiet conditions. Location: one food stall selling salted crisps and sweet doughnuts at an outdoor

Question number	
	market. The stall is interviewed at a loud time (busy lunchtime, live band playing nearby) and a quiet time (early morning).
	Sampling technique: an opportunity sample of 60 adult customers who have just bought and eaten a portion of crisps and a doughnut from the stall, 30 in the loud and 30 in the quiet condition. Noise level is measured with a sound meter app to confirm the conditions differ.
	Interview technique and format: a face-to-face structured interview of 8 questions, asked in the same order by the same interviewer immediately after eating. Closed questions on a 1 to 7 scale: "How sweet was the doughnut?" (1 = not at all, 7 = extremely), "How salty were the crisps?", "How crunchy were the crisps?", "How much did you like the food?", "How much did you like the background sound?".
	One open question: "Describe the taste of the food."
	Data: quantitative ratings; the mean rating for sweetness, saltiness and crunchiness is compared for the loud and quiet conditions in a bar chart. Open answers are coded by two raters.
	Controls: same food, same portion size and same stall in both conditions.
	Ethics: participants are told the purpose, give verbal informed consent, can withdraw at any time, are not named, and are thanked and debriefed.
10(b)(i)	Woods et al. (2011) investigated the effect of background noise on food taste.
	Participants wore headphones and ate foods blindfolded while listening to no sound, quiet or loud white noise. In experiment 1 they rated sweetness, saltiness and liking; in experiment 2 they rated overall flavour, crunchiness and liking.
	Sweetness and saltiness were rated lower in loud than quiet noise, but crunchiness was rated more intense. Liking of the noise was related to liking of the food.
	Background noise reduces taste, possibly by drawing attention away from the food.
10(b)(ii)	First, I used Woods et al.'s finding that loud noise lowers sweetness and saltiness

Question number	
	but increases crunchiness. I chose crisps and doughnuts so that customers could rate all three, using rating questions in my structured interview instead of laboratory ratings. Second, I used their quiet and loud noise conditions. I modified this into a real market at a quiet time and a loud time, measured with a sound meter, instead of white noise played through headphones.
10(c)(i)	A structured interview was used so all customers received the same questions in the same order, such as "How salty were the crisps?", so ratings in the loud and quiet conditions can be compared fairly.
10(c)(ii)	A structured interview gives no chance to ask follow-up questions. If a customer says the doughnut tasted bland, I cannot ask whether the band's noise distracted them, so the reasons for the effect are missed.
10(c)(iii)	An opportunity sample was chosen because customers who have just eaten at the stall are easily available, so a large number of 60 can be interviewed quickly while the taste of the food is still fresh.
	Section B: Health Psychology
11(a)	Aim: to investigate differences between adult males and adult females in rational non-adherence to medical advice. Hypothesis: there will be a difference in the number of males and females who report deciding not to take prescribed medication. Sampling technique: a volunteer sample of 100 men and 100 women aged 18 to 70 who have been prescribed medication in the last year. A link to the questionnaire is posted on a health website and social media.

Question number	
	Technique: an online questionnaire of 15 closed questions, completed at home.
	Closed questions: "Are you male or female?"; "Have you ever stopped taking a prescribed medicine before the end of the course without your doctor telling you to? yes/no"; "How often do you take your prescribed medicine as instructed? always/often/sometimes/never"; rate how important each reason is to you when deciding whether to take a medicine, on a 1 (not important) to 5 (very important) scale: side effects, cost, how quickly it works, long-term benefits, how complicated the dosing is.
	Scoring and analysis: answers are scored automatically. The percentage of men and women who answered "yes" to stopping medication is compared, and mean importance ratings for each reason are compared for males and females in a bar chart.
	Validity and reliability: standardised instructions; the questionnaire is piloted first; some items are reverse-worded to reduce response bias.
	Ethics: the first page explains the study and participants tick a box to give informed consent. No names or email addresses are collected so answers are anonymous. They can withdraw by closing the page and a final debrief page advises them to speak to their doctor before stopping medication.
11(b)(i)	Rational non-adherence is when patients make a reasoned decision not to follow medical advice, for example because they believe the treatment will cause more problems than it solves. Laba et al. (2012) studied the factors that affect a person's decision to continue taking medication. They found that the immediate and long-term harms and benefits of the medication, its cost and the complexity of the regimen all had a significant influence on medication choice. Respondents with private health insurance were less sensitive to cost than those without, showing that people weigh up costs and benefits.

Question number	
11(b)(ii)	First, I used the idea that non-adherence is a rational decision. I included the closed question "Have you ever stopped taking a prescribed medicine...? yes/no" to measure whether males or females make this decision more often. Second, I used the factors found by Laba et al. (harms, benefits, cost, regimen). I turned them into rating questions, so males and females rated the importance of side effects, cost, long-term benefits and complex dosing.
11(c)(i)	Closed questions give answers in the same format for every participant, so the percentage of males and females who stopped medication can be easily calculated and compared.
11(c)(ii)	Closed questions do not let participants explain their behaviour. A woman who answers "yes" to stopping medication cannot say whether it was due to side effects or feeling better, so the reasons are not known.
11(c)(iii)	A volunteer sample was chosen because people who choose to follow the online link are willing to answer questions about their medication honestly, and large numbers of males and females can be reached easily.
	Section B: Organisational Psychology
12(a)	Aim: to investigate whether a token economy reward system reduces accidents in a clothes factory. Hypothesis: there will be fewer accidents in the factory using a token economy than in the factory without one. Type of experiment: a field experiment, carried out in two real clothes factories owned by the same company, similar in size, machinery and products. Experimental design: independent measures. Workers in factory A are the experimental group; workers in factory B are the control group. Factories are

Question number

randomly allocated to condition.

IV: whether a token reward system is used. In factory A, each worker earns a token for every week without an accident or injury and for reporting hazards, such as a broken guard on a sewing machine. Tokens are lost for unsafe behaviour, such as removing a needle guard. Tokens can be exchanged for goods or vouchers. Factory B continues as normal.

DV: the number of accidents (e.g. needle injuries, cuts, burns from steam presses) recorded in the official accident book over 12 months. The number of accidents in the 12 months before the study is also recorded for both factories as a baseline.

Sample: all sewing machinists and pressers (about 150 per factory).

Data: quantitative; the mean number of accidents per month is compared for factory A and B, before and during the study, shown in a line graph.

Ethics: the company and workers give informed consent; workers can choose not to take part in the scheme; accident records are anonymised. Factory B is offered the token scheme afterwards if it works.

12(b)(i) Fox et al. (1987) studied the use of a token economy to reduce accidents at two open-cast mines in the USA. Employees earned stamps (tokens) for working without time lost through injury, for not being involved in accidental damage to equipment, and for behaviour that prevented accidents or injuries. Stamps were lost for unsafe behaviour that could cause accidents. The stamps could be exchanged for goods. The number of days lost through injury fell greatly. The token economy is based on Skinner's operant conditioning, where safe behaviour is positively reinforced, so it is more likely to be repeated.

12(b)(ii) First, I used Fox et al.'s method of giving tokens for working without injury and removing them for unsafe behaviour. I modified this for a clothes factory, so machinists earn tokens for accident-free weeks and lose them for removing needle

Question number	
	guards. Second, I used their idea that tokens are exchanged for goods, as positive reinforcement. Workers in factory A can swap tokens for goods or vouchers, and I compare accident numbers with factory B, which has no rewards.
12(c)(i)	An independent measures design was chosen because it allows the experimental factory with the token economy to be compared directly with a control factory, so any fall in accidents can be linked to the rewards.
12(c)(ii)	With an independent design there is no control over participant variables. Workers in factory A may be more experienced or careful than those in factory B, so fewer accidents may not be due to the tokens.
12(c)(iii)	A field experiment was chosen because it has high ecological validity: workers use real sewing machines and steam presses during their normal working day, so results show whether rewards reduce real accidents.

Cambridge Assessment International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/43**

Paper 4 Specialist Options: Application and Research Methods **May/June 2025**

1 hour 30 minutes

2748105183

You must answer on the enclosed answer booklet.

You will need: Answer booklet (enclosed)

INSTRUCTIONS

- Answer **five** questions in total:
  - Answer questions from **two** options.
    - Section A: answer **four** questions.
    - Section B: answer **one** question.
- Follow the instructions on the front cover of the answer booklet. If you need additional answer paper, ask the invigilator for a continuation booklet.

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 **8** pages. Any blank pages are indicated.

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Section A

Answer questions from **two** options in this section.

Clinical Psychology

Answer **all** questions if you have studied this option.

1 The key study by Chapman and DeLapp (2013) on blood/injection/injury phobia used the subjective unit of discomfort scale (SUDS) to assess the change in the anxiety levels of the patient 'T'.

(a) **(i)** Identify **two** situations included in the SUDS hierarchy used with 'T', other than 'getting a phlebotomy'. [2]

(ii) Give the results for **one** situation of the SUDS hierarchy identified in part **(a)** that show a change in the anxiety levels of 'T'. [2]

(b) Suggest **one** reason why the data gathered from 'T' might **not** be valid. [2]

(c) Explain **two** strengths of using quantitative data to assess the effectiveness of blood/injection/injury anxiety measures. [4]

2 Ellis developed rational emotive behaviour therapy (REBT) for the treatment of mood (affective) disorders.

(a) Outline how irrational beliefs are changed by REBT. [2]

(b) Suggest how the effectiveness of REBT could be measured using a questionnaire. [2]

(c) Explain **two** strengths of using REBT to treat depression. [4]

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Consumer Psychology

Answer **all** questions if you have studied this option.

3 From the key study by Robson et al. (2011) on consumers' responses to table spacing:

(a) **(i)** Participants were asked 'how you would feel about being seated at this table'. One of the questions that the participants then had to rate on the questionnaire was 'I would be overheard by other diners'.

Give **two** other questions that the participants were asked to rate. [2]

(ii) Outline the type of rating scale used by participants to answer these questions. [2]

(b) Suggest **one** way to collect data about the effect of table spacing in restaurants, other than using an online questionnaire with closed questions. [2]

(c) Explain **one** strength and **one** weakness of using rating scales to assess consumers' responses to table spacing. [4]

4 **(a)** Outline what is meant by brand awareness. [2]

(b) Suggest **one** way in which brand awareness could be measured, other than a rating scale. [2]

(c) Explain **one** strength and **one** weakness of the measurement you suggested in part **(b)**. [4]

Health Psychology

Answer **all** questions if you have studied this option.

5 From the key study on positive psychology in schools by Shoshani and Steinmetz (2014):

(a) **(i)** Identify **two** features of the sample used in this study. [2]

(ii) Give the **two** reasons why some participants withdrew from the study. [2]

(b) The study included a 'wait-list control condition'.

Suggest **one** reason for including this 'wait-list control condition'. [2]

(c) Explain **one** strength and **one** weakness of using longitudinal studies to investigate positive psychology in schools. [4]

6 **(a)** Identify **two** behavioural categories included in the UAB pain behaviour scale. [2]

(b) Suggest **one** way in which acute pain can be managed using a psychological treatment. [2]

(c) Explain **two** weaknesses of pain measures that use observation to collect data. [4]

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Organisational Psychology

Answer **all** questions if you have studied this option.

7 From the key study on reasons for sabotage in the workplace by Giacalone and Rosenfeld (1987):

(a) **(i)** 'Subjects were told that they should not write their names or any identifying information on the questionnaires.'

Outline why this was necessary in this study. [2]

(ii) 'Each subject was also advised that the questionnaires were being used for an industrial psychology seminar and that management would not have access to the responses.'

Outline why this was necessary in this study. [2]

(b) The questionnaires used in the study were constructed by an employee who had recently resigned.

Suggest **one** reason why an employee who had recently resigned was chosen to help construct the questionnaires. [2]

(c) Explain **two** reasons why generalisations **cannot** be made about sabotage from one study. [4]

8 **(a)** Explain what is meant by an 'error of commission' when investigating accidents at work. [2]

(b) Suggest **one** way in which an error of commission could be reduced. [2]

(c) Explain **two** weaknesses when gathering data about accidents at work. [4]

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Section B

Answer **one** question from this section.

Clinical Psychology

9 **(a)** Plan a study using a postal questionnaire to investigate attributional styles in adults with depression.

Your plan must include details about:
- type(s) of data
- sampling technique. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of type(s) of data. [2]

(ii) Explain **one** weakness of the use of a postal questionnaire in your study. [2]

(iii) Explain **one** reason for your choice of sampling technique. [2]

Consumer Psychology

10 **(a)** Plan a study using a field experiment to investigate the effect of food name on menu item choice.

Your plan must include details about:
- type(s) of data
- dependent variable. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your experiment. [4]

(c) **(i)** Explain **one** reason for your choice of type(s) of data. [2]

(ii) Explain **one** weakness of your choice of type(s) of data. [2]

(iii) Explain **one** reason for your choice of dependent variable. [2]

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Health Psychology

11 **(a)** Plan a study using a face-to-face interview to investigate the effectiveness of stimulation therapy/TENS for managing acute pain.

Your plan must include details about
- interview format
- sampling technique. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of interview format. [2]

(ii) Explain **one** weakness with conducting a face-to-face interview in your study. [2]

(iii) Explain **one** reason for your choice of sampling technique. [2]

Organisational Psychology

12 **(a)** Plan a study using an interview to investigate the effects of rapid rotation shiftwork on the health of workers.

Your plan must include details about:
- question scoring/interpretation
- interview format. [10]

(b) For **one** piece of psychological knowledge on which your plan is based:

(i) Describe this psychological knowledge. [4]

(ii) Explain how you used **two** features of this psychological knowledge to plan your study. [4]

(c) **(i)** Explain **one** reason for your choice of question scoring/interpretation. [2]

(ii) Explain **one** weakness of your choice of question scoring/interpretation. [2]

(iii) Explain **one** reason for your choice of interview format. [2]

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Surname	StemUp Model Solution
Answer booklet	Write the question number in the left-hand margin at the start of each answer.

Question number

Answers for paper 9990/43

Section A: Clinical Psychology

1(a)(i) Taking blood pressure myself.

Wife taking my blood sugar.

1(a)(ii) Taking blood pressure myself: before treatment T rated this situation at 75 on the SUDS. During the exposure session his rating fell from 55 to 45 to 35, and after treatment it was only 20, so his anxiety had clearly decreased.

1(b) T may have been affected by social desirability or demand characteristics. He knew the therapist wanted the therapy to work, so he may have given lower SUDS ratings than the anxiety he really felt, so the scores would not accurately measure his true level of discomfort.

1(c) One strength is that quantitative data, such as a SUDS rating from 0 to 100, is objective and unambiguous. This lets the therapist make a precise judgement about the patient's current level of anxiety, e.g. that T's anxiety about a tourniquet fell from 45 to 15, rather than relying on vague descriptions like "a bit better".

A second strength is that the measure can be repeated many times in exactly the same way, before, during and after therapy. This means progress, or lack of progress, in the blood phobic patient can be tracked and compared session by session, and the scores can be shown on a graph or compared with other blood phobic patients, which is not easy with qualitative data.

Question number	
2(a)	Ellis said an activating event (A) leads to an irrational belief (B), which causes the emotional and behavioural consequences (C), e.g. depression. In REBT the therapist Disputes (D) the irrational belief, challenging it logically and empirically (e.g. "where is the evidence that you are a total failure?"), so the patient replaces it with a rational belief. The Effect (E) is a new, healthier emotional response to the event.
2(b)	The patient could complete a questionnaire of closed questions before and after the course of REBT, rating statements such as "When something goes wrong I tell myself it is a disaster" on a 5-point scale from strongly agree to strongly disagree. A fall in the total score for irrational beliefs after therapy would show that disputing had been effective.
2(c)	One strength is that once learned, REBT can be used by the patient anywhere and at any time without the therapist. When the depressed patient meets a new activating event, such as being criticised at work, they can dispute their own irrational belief themselves, so the benefits continue after therapy ends and relapse is less likely than when drugs are stopped. A second strength is that research supports its effectiveness. Lyons and Woods (1991) reviewed many studies and found that REBT produced significant improvement compared with control groups. Iftene et al. (2015) found REBT was as effective as antidepressant medication, but without the side effects of drugs, which makes it a more ethical choice for many patients.
	Section A: Consumer Psychology
3(a)(i)	Sitting at this table, I would feel like the restaurant cares about me.

Question number	
	Sitting at this table, I would disturb the next table if I had to get up.
3(a)(ii)	A Likert-type rating scale with seven points, from 1 = strongly disagree, through 4 = neither agree nor disagree, to 7 = strongly agree.
3(b)	A covert observation could be carried out in a real restaurant, using behavioural categories such as leaning away from the next table, lowering voices, and time spent at the table. Observers would tally these for diners seated at tables placed 6, 12 or 24 inches apart.
3(c)	A strength is that the rating scale gives every participant the same fixed responses, so the answers are quick to give and easy to analyse. The researchers could calculate a mean rating for "I would feel exposed" at each table spacing and compare them directly, which would be much harder with qualitative descriptions. A weakness is that the scale only produces quantitative data, so participants cannot explain why they gave a rating. For example, a woman who strongly agrees that she would feel watched cannot say whether this is because of the diners at the next table or the view of the room, so the reasons for the effect of table spacing are not known.
4(a)	Brand awareness is the extent to which consumers are familiar with a brand's identity and its products, e.g. from its name, logo or slogan. It is shown by brand recall (remembering the brand without help) and brand recognition (identifying it from a list or array).
4(b)	A brand recognition task in a structured interview: participants are shown 20 logos with the brand names removed, one at a time, and asked to name the brand. The number of brands correctly identified out of 20 is the brand awareness score.

Question number	
4(c)	A strength is that the logo task gives objective quantitative data. Each participant scores, for example, 14 out of 20, so brand awareness for each logo can be compared as a percentage, e.g. 90% recognised one brand but only 30% recognised another, and these scores can be statistically analysed. A weakness is that recognising a logo in an interview lacks ecological validity. A participant may recognise a logo when it is shown clearly on a card, but in a real supermarket, with many competing brands on a shelf, they may not notice it at all, so the task may overestimate how aware consumers really are of the brand when shopping.
	Section A: Health Psychology
5(a)(i)	1167 students at the start of the study. Students in the seventh, eighth and ninth grades from two large middle schools in the centre of Israel.
5(a)(ii)	Some students were absent from school. Some students refused to complete the questionnaires.
5(b)	The wait-list control school acts as a baseline. Its students continued with their regular social science lessons, so any change in the intervention school's scores could be compared with it to show that the positive psychology programme, and not just growing older, caused the improvement.
5(c)	A strength is that a longitudinal study can test whether what was taught stays with students over time. Measuring the same students at several points showed whether the benefits of the positive psychology lessons, such as higher

Question number	
	self-esteem and lower anxiety, lasted beyond the end of the programme rather than being a short-lived effect. A weakness is that young adolescents change a lot as they grow and are influenced by other events over the months, such as moving to a different type of school which may not promote the same values, family changes or friendships. So it is hard to be sure that later changes in well-being were caused by the programme. Some students also drop out over time, which may bias the final sample.
6(a)	Facial grimaces. Body language, such as clutching or rubbing the painful site.
6(b)	Attention diversion: the patient focuses on something other than the pain, such as counting backwards in 3s or watching a video, while having an injection at the dentist. Less attention is given to the acute pain, so it is felt less strongly.
6(c)	One weakness is that the observer may misinterpret the patient's pain behaviour. A patient who grimaces or rubs a joint may be tired or anxious rather than in severe pain, and an incorrect interpretation could lead to too much or too little pain medication being prescribed. A second weakness is that the observer does not ask the person about their pain and is not experiencing it themselves. Pain is subjective, so a stoical patient who shows few pain behaviours may be in a lot of pain, and the observer misses essential detail, such as whether the patient feels the pain is easing.
	Section A: Organisational Psychology
7(a)(i)	This kept the participants anonymous (confidentiality), so management could not

Question number	
	identify which worker admitted to sabotage and punish them, e.g. by telling them off, demoting them or sacking them.
7(a)(ii)	This was a deception so participants would not know the real purpose of the study and would feel safe. Otherwise they might not have been honest about why sabotage is committed, and the data would not have been valid.
7(b)	The ex-employee knew the company and the ways in which workers there had committed sabotage. As they would not be returning to the company, they had no reason to hide anything, so they could give more honest insight into reasons for sabotage than any other source.
7(c)	First, what counts as sabotage may differ from one company to another. Giacalone and Rosenfeld based their list of reasons on one company's workers, so other organisations may define sabotage differently and workers there may justify it for different reasons. Second, the work and work tools differ between industries. This study was carried out in an electrical factory, so ways of sabotaging machinery there are very different from sabotage in an office, a hospital or a school. It was also done in one country, the USA, and workers in other cultures may see sabotage very differently, so the findings cannot be generalised.
8(a)	An error of commission is when a worker performs an action that is incorrect or inappropriate, misapplying the standard procedure. For example, in the Kegworth air crash, the pilots shut down the working engine instead of the faulty one, causing the plane to crash.
8(b)	Design the system to fit the operator: controls for different actions should look

Question number

and feel different and be clearly labelled, with visual displays and audio warnings that tell the operator immediately when they have selected the wrong control, so the incorrect action can be noticed and stopped.

8(c) One weakness is that the worker involved may not tell the truth. They may exaggerate or play down details of what happened, or fear that they will lose their job if they admit their error, so the account of the accident is inaccurate and wrong conclusions are drawn about its cause.

A second weakness is that the worker, the company and health and safety authorities may define an "accident" differently. A near miss or minor injury may not be counted as an accident at all, so it is never reported, and the data underestimates how often errors happen.

Section B: Clinical Psychology

9(a) Aim: to investigate the attributional styles of adults with depression. Hypothesis: adults with depression will make more internal, stable and global attributions for bad events than adults without depression.

Sampling technique: a volunteer sample. Letters will be sent via three local GP surgeries and a mental health charity asking adults (18 to 65) who have been diagnosed with depression, and adults with no history of depression, to volunteer. I will aim for 60 in each group.

Technique: a postal questionnaire, sent to each volunteer's home with a stamped addressed envelope to return it, so there is no cost to the participant. It is based on the Attributional Style Questionnaire: 12 hypothetical events (6 good, 6 bad), e.g. "You go out on a date and it goes badly". For each event there is one open question: "Write down the one major cause of this event", then three closed questions on 7-point rating scales: "Is the cause due to you (7) or to other people

Question number	
	or circumstances (I)?" (internal), "Will this cause be present again in the future?" (stable) and "Does this cause affect just this situation or all areas of your life?" (global). Types of data: quantitative data from the rating scales; for each participant a mean score from 1 to 7 is calculated for internal, stable and global attributions for bad events. Means and standard deviations will be compared for the two groups and shown in a bar chart. Qualitative data from the open question will be content analysed by two independent raters to check inter-rater reliability. Reliability and validity: the questionnaire is standardised, with the same instructions and question order for everyone, and some items are reverse-scored to reduce response bias. Ethics: an information sheet gives informed consent, and returning the questionnaire shows consent. No names are written on the questionnaire, so data is confidential, and participants are told they can withdraw by not returning it. A debrief letter with helpline numbers is sent afterwards, as the questions may cause distress.
9(b)(i)	Seligman et al. (1988) extended learned helplessness to explain why people respond differently to bad events. A person's attributional style determines whether they become depressed. If someone makes an internal attribution (it is my fault), a stable attribution (it will always be like this) and a global attribution (it will affect everything I do), they are likely to feel helpless and become depressed. If they make external, unstable and specific attributions, helplessness and depression are unlikely. Attributional style can be measured with the Attributional Style Questionnaire, which uses hypothetical good and bad events with rating scales for each dimension.
9(b)(ii)	First, I used the three dimensions of attributional style (internal, stable, global).

Question number	
	This was modified into three 7-point rating scale questions after each event in my postal questionnaire, so each participant got a score for each dimension and I could test whether depressed adults score higher.
	Second, I used the idea of hypothetical good and bad events from the Attributional Style Questionnaire. My questionnaire contained 6 good and 6 bad events, so I could compare depressed and non-depressed adults' attributions for bad events with their attributions for good events.
9(c)(i)	I chose quantitative data because the 7-point ratings can be turned into a mean score for internal, stable and global attributions, so the depressed and non-depressed groups can be compared directly and statistically.
9(c)(ii)	Postal questionnaires may be treated like junk mail, or started and then forgotten. Adults with depression often lack motivation and energy, so many may not return it, giving a low response rate and a biased sample.
9(c)(iii)	A volunteer sample was chosen because people who volunteer are willing and more likely to complete and return the postal questionnaire. This matters with a sensitive topic like depression, where people must agree to share their thoughts.
	Section B: Consumer Psychology
10(a)	Aim: to investigate the effect of descriptive food names on menu item choice.
	Hypothesis: more customers will choose a dish when it has a descriptive name (e.g. "Tender golden roast chicken") than when it has a plain name ("Roast chicken").
	Type of experiment: a field experiment in a real mid-price family restaurant, so customers order as normal.

Question number	
	IV: the menu wording. Condition A: four target dishes have plain names; condition B: the same four dishes have descriptive names using words such as tender, golden, natural and homemade. The rest of the menu, prices, layout and position of the target dishes stay the same. Design: independent measures. Menu A is used on four weeks and menu B on four other weeks, alternated so the days of the week are balanced. Dependent variable: the number of each of the four target dishes ordered per 100 main courses sold, taken from the till records. Waiting staff will not be told the hypothesis, so they do not influence choices, and specials will not be offered. Sample: an opportunity sample of all adult customers dining over the eight weeks (about 2000 diners). Types of data: quantitative data (number of target dishes ordered) shown as percentages and a bar chart comparing menu A and B. In addition, qualitative data: a short card with the bill asks "What made you choose your main course?" and answers are put into categories by two raters. Ethics: the manager gives consent; diners are not identified, so data is confidential. Diners are not harmed as they choose freely. Those who fill in the card are told about the study on it and can choose not to hand it in, which withdraws their data.
10(b)(i)	Lockyer (2006) investigated how words on a restaurant menu affect menu item choice. First, four focus groups discussed five menus with the same items but different wording. The occasion and the people dining affected choice, and diners wanted items they would not normally make at home. Descriptive words had a "mouth-watering" effect and were strong persuaders. A survey based on the focus groups confirmed the positive effect of descriptive words such as "tender", "golden" and "natural" on choosing menu items.

Question number	
10(b)(ii)	First, I used Lockyer's idea that the same dishes can be described with different wording. I modified this from focus group menus into a real restaurant menu, with the same four dishes given plain names on menu A and descriptive names on menu B as my IV. Second, I used the descriptive words "tender", "golden" and "natural" that Lockyer found to be persuasive in the names of my target dishes, and measured actual orders rather than opinions to see if they really increase choice.
10(c)(i)	Quantitative data was chosen because counting the number of target dishes ordered per 100 main courses lets me compare menu A and menu B directly with percentages and statistical tests.
10(c)(ii)	Quantitative data only shows how many diners ordered each dish, not why. A diner may choose the "tender golden roast chicken" because they always order chicken, not because of the name, and the number does not reveal this.
10(c)(iii)	The number of target dishes ordered per 100 main courses was chosen because it is an objective, operationalised measure of choice taken from till records, allowing the menus to be compared fairly even if different numbers of people dined in each week.
	Section B: Health Psychology
11(a)	Aim: to investigate how effective TENS is for managing acute pain. Hypothesis: patients using TENS will report lower pain after treatment than before. Sample: a volunteer sample of 30 adults attending a hospital physiotherapy clinic for acute pain, e.g. a recent back or knee sprain, who are offered TENS. A poster in the clinic waiting room asks for volunteers.

Question number	
	Interview technique: face-to-face in a quiet private room at the clinic, after the patient's first week of using TENS. Interview format: a semi-structured interview. Every participant is asked the same 10 fixed questions in the same order, and the interviewer can ask follow-up questions. Closed questions include: "On a scale of 0 (no pain) to 10 (worst pain imaginable), how bad was your pain before using TENS?", "...and how bad is it after using TENS?", and "How often did you use the TENS machine each day?". Open questions include: "Describe how the pain felt while the TENS machine was on" and "Would you use TENS again? Why?". Scoring and analysis: the 0 to 10 ratings give quantitative data; the mean pain rating before and after TENS is calculated and shown in a bar chart. Answers to open questions are recorded with permission and analysed by two researchers into themes such as "distraction" and "tingling", to check inter-rater reliability. Controls: the same trained interviewer uses a standard script and neutral tone to reduce interviewer bias. Ethics: written informed consent is gained. Participants are told they can stop the interview and withdraw their data at any time, names are replaced with numbers for confidentiality, and the interview does not affect their treatment. They are debriefed at the end.
11(b)(i)	Stimulation therapy is a form of counter-irritation. A mild pain or sensation is applied to distract attention from the stronger pain. One example is transcutaneous electrical nerve stimulation (TENS), which is self-administered. Electrodes are placed on the skin near where the patient feels pain and the device gives mild electrical pulses, producing a tingling feeling that distracts from the pain. TENS is thought to increase the release of endorphins, the body's natural painkillers, and to reduce excitation of neurons in the spinal cord, so fewer pain signals reach the brain.

Question number	
11(b)(ii)	First, TENS is self-administered by the patient. I used this by interviewing patients after a week of using the machine themselves, and asked how often they used it each day, as the amount of use may affect pain relief. Second, TENS works by distracting attention with a tingling sensation. I modified this into an open question, "Describe how the pain felt while the TENS machine was on", so I could find out whether patients noticed the tingling more than the pain.
11(c)(i)	A semi-structured interview was used because every patient is asked the same fixed questions, such as the 0 to 10 pain ratings, so answers can be compared, but the interviewer can also follow up interesting answers about how TENS felt.
11(c)(ii)	Because the interviewer can see the patient face-to-face, patients may not be truthful. They may say TENS reduced their pain more than it did, to please the interviewer or the clinic staff, so the data is less valid.
11(c)(iii)	A volunteer sample was chosen because patients in acute pain must be willing to give up time for a face-to-face interview, and volunteers are more likely to take part and answer all ten questions fully.
	Section B: Organisational Psychology
12(a)	Aim: to investigate the effects of rapid rotation shiftwork on the health of workers. Hypothesis: workers on rapid rotation shifts will report more health problems than day workers. Sample: an opportunity sample of 40 factory workers on a rapid rotation rota (e.g. 2 early, 2 late, 2 night, 2 rest) and 40 day workers from the same company.

Question number

Interview technique and format: a face-to-face structured interview in a private room at the factory, during work time. Every participant is asked the same 12 questions in the same order by the same interviewer, who reads them from a script.

Example questions: "Which shift rota do you work?"; "Have you been diagnosed with or treated for a stomach ulcer or digestive problem in the last 2 years? yes/no"; "How many days have you been off sick in the last 6 months?"; "How often do you feel tired at work?" (never/rarely/sometimes/often/always); and one open question: "How do you think your shift pattern affects your health?".

Question scoring/interpretation: yes/no answers are counted; the frequency scale is scored 1 (never) to 5 (always), so each worker gets a total health problem score. Means for the two groups are compared and shown in a bar chart. Answers to the open question are written down and coded into categories (e.g. sleep problems, digestive problems) by two independent raters, and their agreement is checked for reliability.

Ethics: informed consent is gained, workers are told they can withdraw at any time, and names are not recorded so management cannot see individual answers. Participants are debriefed and given details of the occupational health service.

12(b)(i) Rapid rotation shiftwork means workers change shift every few days. The metropolitan rota is 2 early (6 am to 2 pm), 2 late (2 pm to 10 pm), 2 night (10 pm to 6 am) and 2 rest days. The continental rota is 2 early, 2 late, 3 night, 2 rest, then 2 early, 3 late, 2 night, 2 rest and so on. Knutsson (2003) reviewed research and found shiftwork is associated with specific disorders, especially peptic ulcer disease, coronary heart disease and poor pregnancy outcomes. Gastrointestinal disorders are more common in shift workers than day workers, but there is no evidence that shiftwork affects mortality or cancer.

Question number	
12(b)(ii)	First, I used the description of rapid rotation rotas. Participants are asked "Which shift rota do you work?", so I can check they are on a rota like the metropolitan one and compare them with day workers. Second, I used Knutsson's finding that peptic ulcers and gastrointestinal disorders are more common in shift workers. I turned this into the yes/no question about being diagnosed or treated for a stomach ulcer or digestive problem.
12(c)(i)	The yes/no and 1 to 5 frequency questions were scored so that every worker's answers can be compared, giving a total health score, so the mean for rapid rotation workers can be compared statistically with day workers.
12(c)(ii)	The 5-point scale has a neutral middle option, "sometimes". Many workers may choose it for "How often do you feel tired at work?" to avoid seeming unable to cope, so differences between shift and day workers are hidden.
12(c)(iii)	A structured interview was used so that all workers received the same questions in the same order, from the same script, so differences in answers are due to their shift pattern, not to the interviewer.