GCE A LEVEL

A290U20-1

S18-A290U20-1

PSYCHOLOGY – A level component 2
Psychology: Investigating Behaviour

FRIDAY, 8 JUNE 2018 – MORNING

2 hours 15 minutes

A290U201
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ADDITIONAL MATERIALS

In addition to this examination paper, you will need a WJEC pink 16-page answer booklet.
You may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.
Answer **all** questions.
Write your answers in the separate answer booklet provided.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.
You are reminded of the necessity for good English and orderly, clear presentation in your answers.
Assessment will take into account the quality of written communication used in your answers.

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SECTION A – Principles of Research

Answer **all** *questions.*

1. Define the term 'target population'. [1]

2. Explain **two** weaknesses of conducting research on-line. [3+3]

3. Sketch the following distribution curves:

(a) Normal distribution [1]

(b) Positive skew [1]

(c) Negative skew [1]

4. *(a)* Describe how brain scans have been used in psychology. [6]

(b) Discuss the strengths and weaknesses of using brain scans in psychology. [6]

5. Critically assess whether non-participant observations are more appropriate than participant observations in psychology. [6]

6. *(a)* Evaluate the methodology used by Kohlberg (1968) in his research *'The child as a moral philosopher'*. [6]

(b) Evaluate the sample used by Kohlberg (1968) in his research *'The child as a moral philosopher'*. [6]

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SECTION B – Personal Investigations

You should answer **all** *the questions in this section with reference to the investigations carried out in your study of psychology.*

INVESTIGATION ONE: An experiment on the effect of context on an individual's perception.

7. *(a)* (i) Identify the experimental design used in your research and explain why this experimental design was the most appropriate for your research. [1+3]

(ii) Identify and fully justify the inferential statistical test that you used when analysing the data collected in your experiment. [4]

(b) Explain how you managed **two** ethical issues that arose in your research. [3+3]

(c) Suggest **two** ways in which your experiment could be improved. [6]

INVESTIGATION TWO: A correlational research-relationship between intelligence and another psychological variable (of the learner's choice).

8. *(a)* Identify the fully operationalised co-variable in your research other than intelligence. [2]

(b) With reference to your own correlational research, explain the way you dealt with reliability. [4]

(c) With reference to your own correlational research, explain how you dealt with validity. [4]

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SECTION C – Application of research methods to a novel scenario

Answer **all** *questions.*

9. A Psychology teacher was concerned about the amount of stress her students were experiencing in preparation for their upcoming A level examinations. One month before the examination, she decided to offer her students the opportunity to learn how to meditate. 17 of her students decided to learn how to meditate and practiced meditation for at least 30 minutes per day. 15 of her students decided not to learn how to meditate. As they entered the exam room, she asked each student to rate their stress levels as either 'no stress', 'some stress' or 'very stressed'. The psychology teacher decided to compare the stress ratings of those students who meditated with those students who didn't meditate using a Chi-Square test.

Table of stress ratings of those students who meditated compared with those students who didn't meditate.

	No Stress	**Some Stress**	**Very Stressed**
Students who meditated	5	5	7
Students who did not meditate	2	3	10

(a) (i) Identify the sampling technique that was used in this research. [1]

(ii) Explain **one** advantage and **one** disadvantage of using this sampling technique in this research. [2+2]

(b) (i) Define the term 'social desirability'. [2]

(ii) Explain how social desirability might have influenced this research. [2]

(c) The psychology teacher analysed her results by using a Chi-Square test. Explain why this test was an appropriate inferential statistical test for this research. [4]

Following her initial research the Psychology teacher decided to collect some qualitative data from the students who meditated.

(d) (i) Identify **one** method that could be used to collect qualitative data about the experiences of the students who meditated. [1]

(ii) Justify why the choice of method you identified in *(d)*(i) would be appropriate in this research. [3]

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10. A researcher wanted to investigate if individuals who have a fear of flying (aerophobes) demonstrate lower levels of anxiety if they fly in First Class than if they fly in Economy Class. The researcher asked 12 participants who had just completed a 'Flying without Fear' course to take a short flight between London and Manchester in a First Class seat. The same 12 participants were then asked to take the return flight between Manchester and London in an Economy Class seat. After each flight, the participants were asked to self-report their ratings of anxiety, using the following scale: 0 = no anxiety to 10 = highest level of possible anxiety.

Table of anxiety ratings

Participant Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Anxiety rating after First Class flight	*5*	*3*	*5*	*5*	*4*	*3*	*5*	*6*	*2*	*4*	*6*	*4*
Anxiety rating after Economy Class flight	*7*	*3*	*6*	*5*	*6*	*5*	*6*	*5*	*8*	*6*	*9*	*8*

(a) Explain **one** disadvantage of using a self-report method to rate the anxiety of the participants in this research. [2]

(b) (i) Identify the experimental design used in this research. [1]

(ii) Explain **one** disadvantage of using this experimental design in this research. [2]

(c) (i) Showing your calculations, calculate the mean anxiety ratings of the 12 participants after the First Class flight. [2]

(ii) Give **one** advantage and **one** disadvantage of using the mean as a measure of central tendency in this research. [2+2]

(d) Explain why the ethical issue, 'risk of stress, anxiety, humiliation or pain', might be relevant to this research. [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.

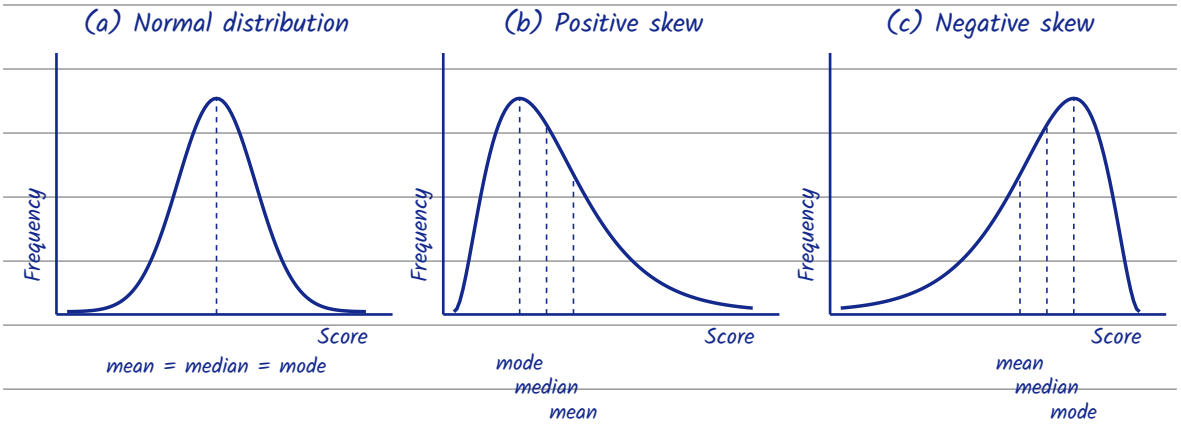
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1. The target population is the whole group of people that the researcher is interested in studying and to whom they want to generalise their findings, from which the sample is drawn.

2. Weakness 1: problems with valid consent. Many people are used to clicking 'I agree' to terms and conditions on-line without reading them, so participants may tick the consent box in the same way without reading the information about the aim and procedure. The researcher therefore cannot be sure that consent is truly informed, and cannot check understanding or answer questions as they could face to face.

Weakness 2: researchers cannot verify the identity of participants. Anyone can complete an on-line survey, so a study aimed at adolescents might be completed by a thirty year old, or one person could take part several times. Because the researcher cannot see the participants, the sample may not match the target population and the data may be invalid, which reduces the generalisability of the findings.

3.



4.(a) Brain scans allow psychologists to study the structure and function of the living

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brain without surgery. In MRI (magnetic resonance imaging), the participant lies inside a large circular magnet which causes the hydrogen atoms in the body to align. When the magnetic field is turned off, the atoms return to their original positions and give off an electromagnetic signal, which a computer translates into detailed images of brain tissue. fMRI uses the same principle but detects changes in blood oxygenation, so it shows which areas are active while a person carries out a task.

In PET (positron emission tomography), a radioactive tracer combined with a substance such as glucose (fluorodeoxyglucose) is injected. After a period of time the participant is placed in the scanner. Active brain areas use more glucose, so they take up more tracer; positrons collide with electrons and release gamma rays, which the scanner detects and plots as a colour map, sometimes in 3-D, showing varying levels of activity.

For example, Raine et al. (1997) used PET scans to compare 41 murderers pleading not guilty by reason of insanity with 41 matched controls while they did a continuous performance task, and found reduced glucose metabolism in the prefrontal cortex of the murderers. Maguire et al. (2000) used MRI to show that London taxi drivers had larger posterior hippocampi than controls.

4.(b)

A strength of brain scans is that they give an objective, scientific measure of brain structure and function. Raine's PET scans produced quantitative data on glucose metabolism that is not open to the researcher's interpretation, unlike self-reports, which increases reliability. Scans also allow investigation of live brains, rather than waiting for a post mortem, so researchers can see how the brain works while a person performs a task. MRI is safe to repeat several times in the short term because, unlike PET, it does not expose the person to radiation, so it is useful for longitudinal research, and PET reveals chemical information that is not available with other imaging techniques.

However, there are weaknesses. Scanners are extremely costly, so they are not easily available for research and samples are often small, such as 41 murderers

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in Raine's study, which limits generalisability. Scans take a long time and the participant must lie still in a noisy, enclosed machine, which is uncomfortable and unsuitable for people with claustrophobia. With PET, participants are injected with a radioactive substance, so it can only be used a few times, raising ethical concerns about risk of harm. Because people are stuck in a machine, only a limited range of activities can be studied, so the task may lack ecological validity. Finally, scans show correlations between brain activity and behaviour, not causes, so the data must be interpreted with care.

5. In a participant observation the researcher joins the group being studied, whereas in a non-participant observation they watch from outside, for example through a one-way mirror, as in Bandura's Bobo doll research.

Non-participant observations are often more appropriate for objective, scientific research. The researcher can remain detached and is less likely to lose objectivity by identifying with the group, which reduces observer bias. They can concentrate on recording data, using a behaviour checklist and time sampling, and a second observer can be used to check inter-rater reliability. In a participant observation the researcher may be overwhelmed with data and find it difficult to record it without being noticed, so they may rely on memory, reducing reliability.

However, participant observations give greater understanding and insight into the data collected, because the researcher experiences the situation from the inside. Rosenhan's (1973) pseudo-patients joined psychiatric wards and gained an insight into the depersonalisation of patients that would be hard to achieve from outside. If the observation is covert, participants behave naturally, increasing ecological validity, but this raises ethical issues of deception and lack of consent. Non-participant observers may also cause participants to change their behaviour if they know they are being watched.

Overall, neither is always more appropriate: non-participant observation is better when reliable, quantitative data on specific behaviours are needed, whereas

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	participant observation is better when the aim is to understand experiences and meanings in a group.
6.(a)	Kohlberg used interviews in which boys were given hypothetical moral dilemmas, such as whether Heinz should steal a drug to save his dying wife. A strength is that interviews allowed Kohlberg to ask supplementary questions to probe the reasoning behind an answer, which was more important than the answer itself. This also suited children, who may be less able to complete a written self-report. However, interviews may be susceptible to researcher bias in how reasoning was interpreted and scored. The dilemmas allowed an objective comparison of reasoning across the sample, as everyone responded to standard stories. However, they examined what the boys said they would do, not what they would actually do, so they may lack validity as a measure of moral behaviour. They may also not be relevant to participants' lives: can a 10 year old boy really relate to the Heinz scenario? Different dilemmas and questions were also used with different ages, reducing standardisation. The longitudinal method allowed Kohlberg to track the actual development of the same boys over 12 years, showing that they progressed through the stages in an invariant sequence, without individual differences that cross-sectional designs suffer from. However, longitudinal research is more likely to suffer from sample attrition. The cross-cultural comparison allowed Kohlberg to assess whether moral development is universal. However, the techniques were developed in one culture (the USA) and questions were changed for Taiwan, for example the Heinz story was altered, so the comparison may be culturally biased.
6.(b)	Kohlberg's main sample was 75 American boys aged 10 to 16 at the start, who were re-interviewed at three-year intervals until they were 22 to 28. Following the same participants over time controlled for participant variables. However,

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	because the youngest boy was 10, there is little evidence for how moral development occurs before that age, so the claim that stages 1 and 2 begin in childhood rests on limited data. The sample was all male. This controlled for the effect of gender, which may influence moral development, and it was acceptable scientific practice when Kohlberg started his research in the 1950s. However, it means that the findings cannot be generalised to females, so the theory may be androcentric. Gilligan (1982) argued that women's moral reasoning is based more on an ethic of care, and because Kohlberg's stages were built on male reasoning, women could appear to be at a lower stage. Kohlberg did include some cultural diversity, with boys from Great Britain, Canada, Mexico, Turkey and Taiwan, which allowed him to argue that the sequence of stages is universal. However, the main findings are based on the 75 American boys, and little is known or published about the characteristics of the participants from the other countries, such as their number, age or social class. Some came from villages and others from cities, so it is unclear whether differences were cultural or due to other factors. Overall, the sample limits the population validity of his findings.
7.(a)(i)	I used an independent groups design. My experiment tested whether context affected how participants perceived the ambiguous 'rat-man' figure (Bugelski and Alampay, 1961). One group first saw a series of animal pictures and the other group a series of faces, and then each participant reported what they saw in the ambiguous figure. Independent groups was most appropriate because each participant could only be exposed to one context. In a repeated measures design, once a participant had seen the figure after the animal pictures, they would recognise it when it was shown again after the faces, and they might work out the aim of the study. These order effects and demand characteristics could not be removed by counterbalancing, as the first perception would carry over, so independent groups gave a fair test of

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	the effect of context.
7.(a)(ii)	I used a Chi-Square test. It was appropriate because I was looking for a difference between the two conditions (animal context and face context) in what participants perceived. The data were nominal, because each participant's response was put into a category, either 'saw a rat' or 'saw a man', and I counted the frequency in each category. The data were independent, because I used an independent groups design, so each participant was in only one condition and gave one response.
7.(b)	Deception and valid consent: telling participants that the study was about context would have affected what they saw, so I told them it was a 'picture recognition task'. To deal with this, I only used mild deception that was unlikely to cause distress, gained written consent from participants who were all sixth form students aged 16 or over, and fully debriefed every participant straight after, explaining the real aim and giving them the chance to withdraw their data. Confidentiality: the BPS Code of Ethics states that participants' data must be kept confidential. I did not record any names with the results; each participant was given a number (for example P1 to P30) and only their condition and whether they reported a rat or a man was recorded. The consent forms were stored separately from the data in a locked drawer, so responses could not be linked to individuals and no one could be identified in my write-up.
7.(c)	Firstly, I could improve the sample. I used an opportunity sample of 30 students from my sixth form, all aged 16 to 18, which is not representative of the wider population, as older people may have more experience with ambiguous figures. I could use a larger stratified sample, with sub-groups based on age and gender in the same proportions as the target population, and then randomly select from each. This would improve population validity, so I could generalise more

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	confidently that context affects perception in everyone, and reduce the chance that one group happened to contain people who were already more likely to see a man. Secondly, I could standardise the procedure for presenting the stimuli. In my experiment the pictures were shown on printed cards, so the time each participant spent looking at the context pictures and the ambiguous figure varied. I could present all of the pictures on a computer, each for exactly 2 seconds, with the same recorded instructions. This would control the extraneous variable of exposure time, so any difference between the groups would more confidently be due to the context, increasing internal validity, and the study would be easier to replicate, improving reliability.
8.(a)	Self-esteem, measured by each participant's total score on Rosenberg's Self-Esteem Scale (10 items rated on a 4-point scale, giving a score from 10 to 40, where a higher score means higher self-esteem).
8.(b)	To deal with reliability, I standardised the procedure. Every participant completed Raven's Standard Progressive Matrices to measure intelligence and Rosenberg's Self-Esteem Scale in the same quiet classroom, with the same written instructions read aloud and the same time limit, so differences in scores were not caused by differences in procedure. I also checked the external reliability of the self-esteem scale using the test-retest method: 10 participants completed the Rosenberg scale again two weeks later and I correlated their two sets of scores using Spearman's rho. The correlation was strong and positive (above +0.8), showing the scale measured self-esteem consistently over time, so I could be confident that my results were reliable.
8.(c)	To deal with validity, I checked the concurrent validity of my self-esteem measure by comparing participants' Rosenberg scores with a teacher's rating of each student's confidence; the two were positively correlated, suggesting the

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	scale measured what it claimed to. I used Raven's Progressive Matrices because it is a non-verbal, culture-fair test, so scores reflected reasoning ability rather than reading ability, improving construct validity. I also controlled extraneous variables: the questionnaires were anonymous to reduce social desirability bias, and participants did not see their intelligence scores before rating their self-esteem, so their answers on one variable did not influence the other.
9.(a)(i)	Self-selected (volunteer) sampling, because the students decided for themselves whether or not to learn to meditate.
9.(a)(ii)	Advantage: the teacher knows that the students who chose to meditate definitely wanted to take part, so they are more likely to be committed to practising for at least 30 minutes per day for the whole month, reducing drop-out. Disadvantage: the sample is likely to be unrepresentative, because the 17 students who chose to meditate may differ from the 15 who did not, for example by being more motivated or already more relaxed, so this, not meditation, may explain their lower stress ratings.
9.(b)(i)	Social desirability is when a participant responds in the way they think others would find favourable or acceptable, rather than truthfully, in order to present themselves in the best possible light.
9.(b)(ii)	The students who meditated may have artificially lowered their stress rating because they did not want to admit to their teacher that they were still stressed, especially as she had helped them learn meditation, making meditation appear more effective than it was.
9.(c)	Chi-Square was appropriate because the teacher was looking for a difference in stress ratings between the students who meditated and the students who did

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	not meditate. The data were independent, because each student was either a meditator or a non-meditator and gave only one stress rating. Finally, the data were nominal, because the teacher counted the number of students in each category, 'no stress', 'some stress' or 'very stressed', which are frequencies in categories.
9.(d)(i)	A semi-structured interview with each of the students who meditated.
9.(d)(ii)	The teacher could ask open questions, such as 'How did meditating make you feel in the weeks before the exam?', which would collect rich qualitative data about each student's experience in their own words. She could also ask supplementary questions if a student said something interesting about their stress levels or how they meditated, while the set questions keep the interviews comparable across the 17 students.
10.(a)	The participants may not give an honest anxiety rating. As they had just completed a 'Flying without Fear' course, they may report lower anxiety than they felt, to show the course had worked or to please the researcher.
10.(b)(i)	Repeated measures design.
10.(b)(ii)	Order effects: as all 12 participants flew First Class first, their anxiety on the return Economy flight may have been affected by having already flown that day, for example higher because of tiredness, so the difference may not be due to the class of seat.
10.(c)(i)	Mean = (5 + 3 + 5 + 5 + 4 + 3 + 5 + 6 + 2 + 4 + 6 + 4) ÷ 12 = 52 ÷ 12 = 4.33 (4.3 recurring)
10.(c)(ii)	Advantage: the mean uses all 12 participants' anxiety ratings, so it is the most

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sensitive measure and it can be used in further statistical analysis, such as comparing with the Economy Class mean of 6.17.

Disadvantage: the mean of 4.33 is not a rating that any participant could actually give on the whole-number 0 to 10 scale, and it can be distorted by an anomalous score, such as participant 9's low rating of 2.

10.(d) Even though they have completed the course, the participants are aerophobes, so being exposed to two flights may cause them real anxiety and stress, and they may feel humiliated if they show panic in front of other passengers or people they know from the course.