7.15 Research methods: variables, hypotheses, choosing a statistical test and the sign test: Test Pack

AQA 7182 · Calculator allowed · about 15 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions.

1 The psychologist wants to recruit a sample of adults from the general population for the mindfulness study.

(a) Identify a sampling method the researcher could use to recruit an unbiased sample, and describe how it would be carried out. **(3)**

(b) Explain one limitation of this sampling method. **(3)**

(Total for Question 1 is 6 marks)

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2 Before conducting a study, researchers set a significance level (often $p < 0.05$) to decide whether to reject the null hypothesis.

(a) Explain what is meant by a 'Type I error' and a 'Type II error' in the context of a psychological study. **(4)**

(b) Explain why psychologists conventionally use a significance level of $p < 0.05$, rather than a stricter level such as $p < 0.01$. **(2)**

(Total for Question 2 is 6 marks)

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Question 1

(a) identifies a suitable probability sampling method, e.g. random sampling oe **M1**

(a) describes the method, e.g. obtaining a complete list of the target population and using a random method, such as a random number generator, to select participants from it oe **A1**

(a) explains that every member of the target population has an equal chance of being selected oe **A1**

(a) Answer: Random sampling: obtain a full list of the target population and use a random method (e.g. a random number generator) to select participants, giving everyone an equal chance of selection.

(b) identifies a genuine limitation of random sampling oe **M1**

(b) e.g. obtaining a complete, accurate list of the whole target population can be difficult or impossible in practice oe **A1**

(b) and/or selected individuals may refuse to take part, meaning the final sample may still not be fully representative despite being randomly selected oe **A1**

(b) Answer: A complete list of the population may be hard to obtain, and selected people may refuse to take part, so the final sample may still not be fully representative.

Question 2

(a) a Type I error is rejecting the null hypothesis (concluding there is a significant effect) when the null hypothesis is actually true, a 'false positive' oe **M1**

(a) e.g. concluding the mindfulness intervention worked when it actually had no real effect oe **A1**

(a) a Type II error is failing to reject the null hypothesis (concluding there is no significant effect) when the null hypothesis is actually false, a 'false negative' oe **M1**

(a) e.g. concluding the mindfulness intervention did not work when it actually did have a real effect oe **A1**

(a) Answer: Type I error: wrongly concluding there is a significant effect when there is not. Type II error: wrongly concluding there is no significant effect when there is one.

(b) $p < 0.05$ balances the risk of a Type I error against the risk of a Type II error oe **M1**

(b) a stricter level such as $p < 0.01$ reduces the risk of a Type I error but increases the risk of missing a genuine effect (a Type II error), so $p < 0.05$ is a reasonable, conventional compromise oe **A1**

(b) Answer: $p < 0.05$ is a conventional balance between the risk of a Type I error and the risk of a Type II error.

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