7.3 Spearman's Rho: Rationale, Application and Critical Values: Test Pack

AQA 7182 · about 15 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions.

1 State, in one sentence, the main purpose of Spearman's ρ as a statistical test in psychological research on ranked data.

(Total for Question 1 is 1 mark)

2 A researcher must choose between a one-tailed and a two-tailed Spearman's ρ test. Describe one clear reason for choosing a one-tailed test and one clear reason for choosing a two-tailed test in the context of hypothesis testing.

(Total for Question 2 is 3 marks)

3 Explain briefly what is done to raw scores before applying the Spearman's ρ formula in a study comparing two co-variables measured on ordinal scales.

(Total for Question 3 is 2 marks)

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4 When two or more raw scores are tied in one co-variable, describe the standard procedure for assigning ranks to those tied values and give a brief numeric example.

(Total for Question 4 is 2 marks)

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5 Explain briefly how tied ranks in one or both co-variables affect the calculation and interpretation of Spearman's ρ.

(Total for Question 5 is 2 marks)

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Mark scheme · 7.3 Spearman's Rho: Rationale, Application and Critical Values: Test Pack

Question 1

states that Spearman's ρ measures the strength and direction of a monotonic association between two ranked or ordinal variables **B1**

Answer: Spearman's ρ measures the strength and direction of the association between two variables when the data are ranked or ordinal.

Question 2

one-tailed: identifies that a one-tailed test is used when the researcher has a directional hypothesis specifying the expected direction of the association oe **M1**

adds that this increases power to detect an effect in that specified direction but cannot detect an effect in the opposite direction oe **A1**

two-tailed: identifies that a two-tailed test is used when the researcher has a non-directional hypothesis and wants to detect an association in either direction oe **M1**

Answer: One-tailed is chosen for a directional hypothesis (e.g. expecting a positive association), giving greater power to detect an effect in that direction. Two-tailed is chosen for a non-directional hypothesis, allowing detection of an association in either positive or negative direction.

Question 3

states that raw scores on each co-variable are converted to ranks independently **M1**

may mention that differences between paired ranks are then used in the Spearman's ρ formula **A1**

Answer: Each set of raw scores is converted into ranks separately; the differences between each pair of ranks are then used in the Spearman's ρ formula.

Question 4

identifies that tied values are assigned the average of the ranks they would otherwise occupy **M1**

gives a numeric example, e.g. two tied values occupying positions 4 and 5 both receive rank 4.5 **A1**

Answer: Assign the mean of the ranks those tied scores would otherwise occupy; for example two tied items in positions 4 and 5 each receive rank 4.5.

Question 5

states that tied values require assigning average ranks which may produce fractional ranks oe **M1**

explains that ties reduce the maximum attainable magnitude of ρ slightly and can complicate exact significance tables, so adjustments or exact methods may be needed in some cases oe **A1**

Answer: Tied values are given average ranks, producing fractional ranks; ties can reduce the maximum attainable ρ and make exact critical-value tables less accurate, so ties are taken into account when interpreting results or using adjusted methods.

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