

Mark schemes

Q1.**[AO3 = 1]****Answer:** C – Meta-analysis**[1]****Q2.****(a) [AO1 = 1]****B** The abstract, the discussion and the results sections only.**1****(b) [AO2 = 1]****A** –0.80**1****(c) [AO2 = 3]****1 mark** for scattergram/scattergraph.**Plus****2 marks** for a clear and coherent explanation linked to this study.**1 mark** for a limited or muddled explanation.**Possible content:**

- the study is correlational/looking at the relationship between recreational screen time and academic performance
- scattergrams display relationships between co-variables, academic performance and recreational screen time are co-variables.

Credit other relevant material.

3**(d) [AO2 = 2]****2 marks** for a clear and coherent explanation linked to this study.**1 mark** for a limited or muddled explanation.**Possible content:**

- correlation only shows a relationship between the two co-variables, recreational screen time and academic performance
- researcher's conclusion implies causation, increased recreational screen time impairs academic performance
- third variable could be responsible for the relationship, eg personality type, number of hours spent studying.

Credit other relevant material.

2

(e) [AO1 = 2]

2 marks for a clear and coherent definition of meta-analysis.

1 mark for a limited or muddled definition of a meta-analysis.

Possible content:

- meta-analysis is the process where researchers collect and collate a wide range of previously conducted research on a specific area
- collated research is reviewed together
- combined data/effect size is often statistically tested to provide an overall conclusion.

Credit other relevant material.

2

9

Q3.

[AO2 = 2]

1 mark for each of the following:

- there is a large anomalous result in the data set/ student 9 has been told off 25 times
- the median is not affected by this/this would distort the mean value.

Accept answers based on the level of data (not interval/mean not appropriate).

[2]

Q4.

[AO2 = 4]

For the strength award:

2 marks for a clear, coherent strength with appropriate application.

1 mark for a limited or muddled strength.

For the limitation award:

2 marks for a clear, coherent limitation with appropriate application.

1 mark for a limited or muddled limitation.

Possible content:

- quantitative data is straightforward to analyse so the effects of the 2 km breacktime run on stress levels can be easily assessed
- quantitative data is too restrictive to assess stress levels as the feeling/type/duration/context of stress is not given, decreasing the validity of the data

Credit other relevant material.

[4]

Q5.

(a) [AO2 = 2 AO3 = 2]

Median:

1 mark for interpreting what the median suggests about the effect of the 2 km breaktime run on the students' stress ratings – students are less stressed after the 2 km breaktime run/condition A (than when they do not run at breaktime/condition B).

Accept alternative wording.

PLUS

1 mark for an accurate justification about the difference in the median stress ratings in each condition – median stress rating is lower in condition A (than condition B) or median stress rating is higher in condition B (than condition A).

Accept alternative wording.

Range:

1 mark for an accurate comment about what the ranges suggest about the spread of stress rating in each condition – stress ratings are more consistent in condition B (than condition A) or stress ratings are less consistent in condition A (than condition B).

Accept alternative wording.

PLUS

1 mark for a justification about the difference between the ranges in each condition – range is greater in condition A (than condition B) or range is smaller in condition B (than in condition A).

Accept alternative wording.

Note – 0 marks for just stating the data from the table.

Note – Justifications are not creditworthy in isolation.

Note – Credit can be given to responses which suggest stress levels are similar between conditions due to a minimal difference (of 1.5) in median stress levels.

(b) [AO2 = 4]

Level	Marks	Description
2	3-4	Explanation is clear and coherent, showing sound understanding of one limitation of using the range to represent the spread of stress ratings in each condition. The material is applied appropriately. There is effective use of terminology.
1	1-2	The explanation shows some understanding of one limitation of using the range to represent the spread of stress ratings in each condition. Application is limited/not always appropriate/not made explicit. The answer lacks clarity and coherence. Use of terminology is either absent or inappropriate.
	0	No relevant content.

Possible content:

- these range values only take the two extreme stress ratings into account
- these range values are not calculated using each individual stress rating
- these range values can be distorted by outliers, e.g. it could be the case that most students in condition A had a stress rating of 4 but one individual hated running and so reported a stress rating of 10 in this condition, this could result in the range of 6 as shown but would not represent the spread of the data collected.

Credit other relevant material.

Q6.

(a) [AO2 = 1 AO3 = 1]

1 mark: meditation is more effective than a healthy diet.

Accept alternative wording.

At least one strategy must be correctly named.

PLUS

1 mark for an accurate justification about the difference in the mean scores: reduction in mean heart rate is greater after meditation than a healthy diet.

Accept alternative wording.

0 marks for just stating the data from the table.

Justifications are **not** creditworthy in isolation.

2

(b) [AO2 = 1 AO3 = 1]

1 mark: there is less dispersion/variation in/spread (around the mean) of heart rate after the meditation.

Accept alternative wording.

PLUS

1 mark: standard deviation is smaller after meditation than before.

Accept alternative wording.

0 marks for just stating the data from the table.

Justifications are **not** creditworthy in isolation.

2

(c) [AO2 = 3]

3 marks for a clear and coherent outline of how the psychologist could have obtained informed consent including reference to both giving information about the procedure of the study and agreeing to take part. There must be some explicit detail of the follow-up study.

2 marks for an outline of how the psychologist could have obtained informed consent using some of the detail given below and including reference to both giving information about the procedure of the study and agreeing to take part.

1 mark for a muddled or limited outline of how the psychologist could have obtained informed consent.

Possible content:

- tell the teachers they would need to complete meditation or healthy diet for a week
- tell them they would have their heart rate measured at the beginning and end of the week
- explain they have the right to withdraw
- ask for agreement/obtain a signature.

Accept other relevant content.

3

(d) [AO3 = 6]

Level	Marks	Description
3	5-6	Outline of two ways in which the psychologist might change the design of this study is appropriate, clear and generally well detailed. The answer is generally coherent with appropriate use of terminology.
2	3-4	Outline of two ways in which the psychologist might change the design of this study is appropriate. The answer is generally coherent but may lack clarity and/or detail. OR one way at Level 3 (max 3 marks).
1	1-2	Outline of two ways in which the psychologist might change the design of this study is limited and/or muddled. The answer as a whole is not clearly expressed. OR one way at Level 1/2. Maximum 1 mark if one or two ways named only
	0	No relevant content.

Possible changes:

- random allocation: the teachers could be randomly assigned to the meditation and healthy eating condition by a lottery/hat/random number generator
- matched pairs: the teachers could be matched on key characteristics which might affect meditating or dieting such as health/age/gender/personality with one member of each pair taking part in each condition
- repeated measures design: all the teachers could be tested in both meditation and healthy diet condition. Use of counterbalancing/leaving time between the two conditions.

Credit other possible changes which might address the issue of individual differences eg larger sample size of teachers.

6

[13]**Q7.****[AO2 = 4]****Ordinal data explanation****2 marks** for a clear and coherent explanation with some detail.**1 mark** for a limited/muddled explanation.

- All the mood scores should be ordered from lowest to highest and given a rank place (eg the highest score would get a rank of one, the next highest a rank of two etc).
- Any equal scores would share a rank place.

Nominal data explanation**2 marks** for a clear and coherent explanation with some detail.**1 mark** for a limited/muddled explanation.

- Scores could be categorised into groups according to mood, so each participant would then be in one of the categories.
- For example, scores under 40, scores between 40 and 60, scores over 60.

Answers must refer to conversion of existing data for credit. Do not credit a new way of collecting data. If Ps are asked to do anything new then the answer is not about conversion.

Credit can be given for explanations in diagram form.

[4]

Q8.

(a) [AO2 = 2]

2 marks for a clear and coherent reason with some relevant elaboration in the context of this study.

1 mark for a limited/muddled reason.

Possible content:

- it would be difficult to dictate the number of hours the students should sleep
- it may be more ethical to conduct a correlation rather than restrict how many hours each student slept.

Credit other appropriate reasons.

2

(b) [AO2 = 3]

Award 1 mark for each bullet point:

- collect the names of all the 1st year students at the researcher's university
- put all the students' names into a hat/computer random name generator
- select a name in an unbiased manner to include as students in the experiment, repeat this until 18 names have been selected.

3

(c) [AO2 = 4]

Award 2 marks for each bullet point:

- correlational hypothesis (1 mark) as the researcher is investigating the relationship between the number of hours slept and how well rested the students feel (1 mark)
- ordinal data (1 mark) as they are using an arbitrary scale of 1–5 to assess how well rested the students feel/not a universal or standardised measure (subjective) of how well rested the students feel but can be ranked (1 mark).

4

(d) [AO2 = 4]

Award 1 mark for each bullet point:

- the critical value is 0.401 (accept value identified in table)
- the hypothesis is directional/it is a one-tailed test
- there are 18 participants so $N=18$
- the level of significance is 0.05.

4

(e) [AO2 = 2]

Award 1 mark for each bullet point:

- the researcher's hypothesis should not be accepted (as the result is not significant)
- because the calculated value of rho (0.395) is less than the critical value (0.401).

Note: if students have identified the critical value incorrectly as lower than the calculated value in part (d), to gain the first bullet point they should state that the researcher's hypothesis should be accepted (as the calculated value of rho is greater than the critical value identified).

2

(f) **[AO2 = 2]**

2 marks for a clear and coherent explanation with some relevant elaboration in the context of this study.

1 mark for a limited/muddled explanation.

Possible content:

- the 5% level of significance is the conventional level of probability employed by psychologists/balances the risks of making a Type I and Type II error
- the researcher is investigating the relationship between numbers of hours slept and how well rested participants feel, this is not a sensitive topic nor one which may affect individual's health (as in clinical trials).

2

(g) **[AO2 = 2]**

2 marks for a clear and coherent explanation with some relevant elaboration in the context of this study.

1 mark for a limited/muddled explanation.

Content:

- when the researcher accepts there is no correlation between the number of hours slept and how well rested they felt (null hypothesis) even though the alternative hypothesis is correct
- when the researcher believes the relationship between the number of hours slept and how well rested they felt is not significant when it is (false negative).

2

[19]