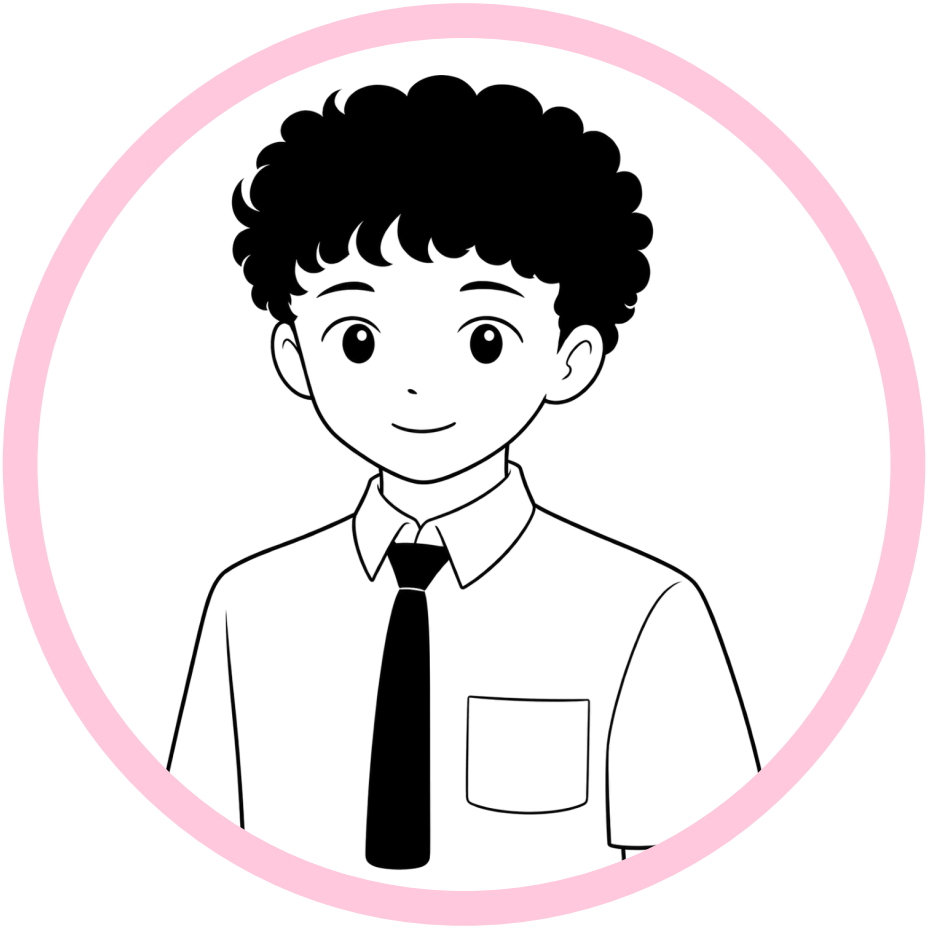
AQA A-LEVEL PSYCHOLOGY · 7182

PSYCHOLOGY



MARK SCHEME

3.2.3.1 RELIABILITY

SCORE	PERCENTAGE
/157	%

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Q1.

[AO2 = 3]

3 marks for a clear, coherent and fully elaborated explanation
2 marks for an explanation with some elaboration
1 mark for a limited or muddled explanation

Content
An observation would be more appropriate because a self-report method like a questionnaire would lead to socially desirable answers/lying/self-delusion/misremembering, so would not reflect what really happens at the gym, so the data would lack validity.
(Accept alternative wording.)

Note: responses which are inappropriate for the scenario are not creditworthy.

Q2.

[AO2 = 6 AO3 = 6]

Level	Marks	Description
4	10 – 12	Suggestions are generally well detailed and practical, showing sound understanding of observational techniques. **All four** elements are presented appropriately. Justifications are appropriate. The answer is clear and coherent. Specialist terminology is used effectively. Minor detail and/or explanation sometimes lacking.
3	7 – 9	Suggestions are mostly sensible and practical, showing some understanding of observational techniques. **At least three** elements are presented appropriately. There is some appropriate justification. The answer is mostly clear and well organised. Specialist terminology is mostly used effectively.
2	4 – 6	Some suggestions are appropriate but others are impractical or inadequately explained. **At least two** elements are presented appropriately. Justifications are partial or muddled. The answer lacks clarity, accuracy and organisation on occasions.
1	1 – 3	**At least one** element is addressed but knowledge of observational techniques is limited. Justifications are absent. The whole answer lacks clarity, has many inaccuracies and is poorly organised.
	0	No relevant content.

Four elements of design to be credited:

- **Type of observation with justification** – eg covert or overt, naturalistic, participant

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or nonparticipant and why

- **Operationalised behavioural categories** – detail of at least two specific and observable behaviours to be recorded. This must go beyond the idea of global constructs such as exercising, socialising, use of other facilities

- **Use of time and/or event sampling with justification** – recordings can take place at specified time intervals (time sampling) eg every minute or as the behaviour occurs (event sampling) eg number of times interaction occurs with another gym member. The type(s) of sampling must be appropriate for the behaviours chosen

- **How reliability of the data collection could be assessed**, inter-observer reliability eg using two observers/raters and comparing separate recordings; statistical comparison (correlation) of data from both observers/raters, intra-observer reliability eg checking video recordings.

Note: test-retest is not creditworthy but repeated observation of a video recording is creditworthy.

Q3.

(a) **[AO3 = 2]**

Award **1 mark** for outline of a positive correlation / as one variable increases, so does the other.

and

1 mark – It would not be appropriate because correlation only shows a relationship between the two variables, not cause.

(b) **[AO3 = 2]**

2 marks for a clear, coherent outline of an appropriate way of dealing with a relevant ethical issue.

1 mark for a vague / muddled or incomplete outline of an appropriate way of dealing with a relevant ethical issue.

0 marks if the ethical issue is irrelevant or the way is inappropriate.

Relevant issues would include:

- asking for consent
- preferably written and on more than one occasion
- offering the right to withdraw from the study
- maintaining confidentiality
- treating with respect.

(c) **[AO3 = 4]**

Award **one mark** for each of the relevant points below:

- the same participants would complete the sleep questionnaire on more than one occasion
- each participants' scores from the first occasion should be correlated with his / her results from the later occasion to be shown on a scattergraph to describe the correlation, with scores from the first test

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plotted on one axis and the scores from the second test plotted on the other axis
- the strength of the correlation should then be assessed using either a Spearman's rho test (or a Pearson's r test)
- the degree of reliability is then determined by comparing the correlation with the statistical table to determine the extent of correlation – there should be a (strong) positive correlation between the two sets of scores.

Q4.

[AO2 = 12]

Level	Marks	Description
4	10 – 12	Suggestions are generally well detailed and practical, showing sound understanding of observational techniques. **All four** elements are present. There is sufficient information for most aspects of the study to be implemented with success. The answer is clear and coherent. Specialist terminology is used effectively. Minor detail and / or explanation sometimes lacking.
3	7 – 9	Suggestions are mostly sensible and practical, showing some understanding of observational techniques. **At least three** elements are present. Implementation of some aspects is possible. The answer is mostly clear and well organised. Specialist terminology is mostly used effectively.
2	4 – 6	Some suggestions are appropriate but others are impractical or inadequately explained. **At least two** elements are addressed. Implementation would be difficult based on the information given. The answer lacks clarity, accuracy and organisation on occasions.
1	1 – 3	**At least one** element is addressed but knowledge of observational techniques is limited. Implementation would be very difficult. The whole answer lacks clarity, has many inaccuracies and is poorly organised.
	0	No relevant content.

Four elements of design to be credited:

- **The task for the participants** – detail of what the men and women in the study will have to do. This must go beyond 'give a presentation to an audience'.
- **The behavioural categories to be used and how the data will be recorded** – detail of specific and observable behaviours to be recorded. This must go beyond the idea of global constructs such as 'body language' or 'gesture'. Also detail of recording method to be used, eg record sheet.
- **How reliability of the data collection might be established**, eg using two observers / raters and comparing separate recordings; statistical comparison of data from both observers / raters.
- **Ethical issues to be considered**, eg specific or more general ethical considerations as applied to this study – protection of welfare, confidentiality

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and deception, respect or integrity.

Examples of possible tasks:

- presentation of findings from a school project
- presentation on ‘My Hobby’
- presentation on ‘My Holiday’.

Examples of suitable non-verbal behaviours include:

- arm movements
- smiling
- speech hesitations
- pointing etc.

Q5.

(a) **[AO2 = 3]**

One mark for knowledge of inter-rater (observer) reliability (this may be named or implicit in the application)

Plus

Up to two marks for applying knowledge of how reliability of the category system could be assessed in this study.

For example:

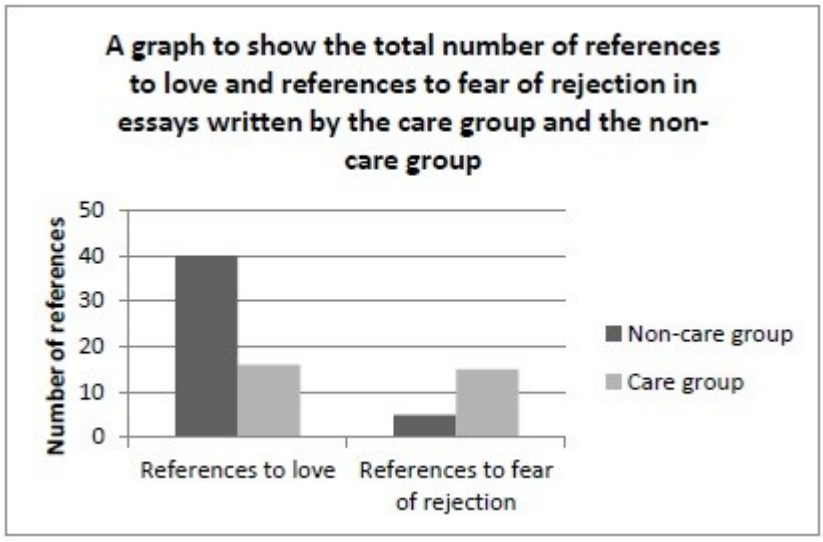
The consistency between the recordings of two researchers would be assessed by asking each researcher to categorise the essays independently for ‘references to love’. The data would then be compared and if similar then the analysis is reliable.

Credit reference to the fact that the correlation coefficient between the researchers’ data should exceed 0.8.

(b) **[AO2 = 3]**

Up to 3 marks for an accurate sketch of a bar chart to represent the data in the table

- **1 mark** for an appropriate title
- **1 mark** for correctly labelled axes
- **1 mark** for accurately plotted bars (4 in total)



(c) **[AO2 = 3]**

- **1 mark** for calculating the total number of references to love overall (16+40 = 56)
- **1 mark** for representing the total number of references to love in the care group as a fraction of the total number of references to love overall (16/56)
- **1 mark** for dividing both parts of the fraction by the lowest common denominator (16/8 = 2; 56/8 = 7) to produce the correct answer (2/7)

(d) **[AO3 = 3]**

3 marks for clear explanation plus coherent elaboration

2 marks for explanation plus some elaboration

1 mark for vague/muddled explanation

Students may make a single, elaborated point or a number of points in less detail.

Possible content

- The interviewer could have asked follow-up questions to gain greater insight into some of the points raised in the essay
- The interview would produce more detail/depth of information than the participant would have been able to reveal within the essay
- Interview data would have provided a further measure of reliability/validity of the original essay content
- The interviewer may have gained rapport with the participant so they have felt comfortable revealing more personal/sensitive information face-to-face

Accept other valid points.

(e) **[AO1 = 4 AO2 = 2]**

Level	Marks	Description

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3	5 – 6	Knowledge of Bowlby's monotropic theory is clear and accurate. There is appropriate use of the data in the table and clear links made to Bowlby's theory. The answer is clear and coherent. Specialist terminology is used effectively.
2	3 – 4	Knowledge of Bowlby's monotropic theory is present though there may be some inaccuracy/lack of clarity. There is some attempt to use the data in Table 1 though the links to Bowlby's theory may not always be clear. There is some appropriate use of specialist terminology.
1	1 – 2	Knowledge of Bowlby's theory is briefly stated with little elaboration. The use of data in Table 1 in the context of Bowlby's theory may be inappropriate or absent. The answer may include inaccuracies and be poorly organised. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

Knowledge of Bowlby's monotropic theory:

- Unique 'monotropic' relationship with mother-figure
- Notion of critical/sensitive period up to approx. 2 years
- Importance of internal working model for future relationships
- Social releasers to facilitate bond
- Reciprocal process

Accept other valid points.

Possible application:

- The care group made fewer references to love in their essays/more reference to fear of rejection which suggests their lack of monotropic bond may have affected the quality of their future relationships
- Failure to form internal working model in the care group
- Adopted at 5 so missed critical period for formation of bond

Q6.

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

1 mark – the hypothesis should be directional

Plus

1 mark – because there is past research indicating the likely direction of the effect

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(or similar)

(b) **[AO1 = 2 AO3 = 2]**

2 marks for a clear and coherent explanation of operationalisation

1 mark for a brief or muddled explanation of operationalisation

Content: operationalisation involves clearly specifying/defining observable behaviours that represent the more general construct under investigation/to enable the behaviour under investigation to be measured

Plus

1 mark each for two observable behaviours that could represent 'riding a bike with care'.

Examples: use of cycle lanes/tracks, passing pedestrians at a distance of at least 1 metre, using bicycle bell.

Credit any relevant observable behaviour.

(c) **[AO2 = 3]**

1 mark for knowledge of the term face validity – where a behaviour appears at first sight (on the face of it) to represent what is being measured

Plus

2 marks for clear and coherent application of the concept of face validity to the context

1 mark for brief or muddled application of the concept of face validity to the context

Application: Having a dog on a lead appears at first glance to be measuring considerate behaviour because if a dog is on a lead it is less able/likely to upset other people by coming close, frightening, chasing, biting, growling etc.

Credit other relevant applications.

(d) **[AO1 = 4]**

1 mark for each of two types of validity identified

Plus

1 mark each for a brief outline of each type of validity identified

Content:

- Concurrent – where performance on one measure correlates highly with performance on another measure of the same variable
- Ecological – where a measure of a behaviour accurately reflects the way in which the behaviour would occur in normal circumstances
- Temporal – where findings from research that took place at a certain point in time accurately reflect the way that behaviour would occur at a different point

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in time

Credit also other types of validity eg criterion, content, construct, population, predictive.

(e) **[AO2 = 1]**

1 mark – C Event sampling

(f) **[AO2 = 3]**

1 mark for each of the following:

- The student pair should discuss and agree beforehand their interpretation of the behavioural categories
- Each student should then observe the same people/space/target at the same time but record/tally independently
- Their respective recordings/tallies should be correlated using an appropriate statistical test ascertain the level of agreement

(g) **[AO2 = 3]**

1 mark for the correct ratio: 3:2

Plus

2 marks for full workings: 23 + 12 + 19 = 54 and 10 + 17 + 9 = 36

54:36 both divisible by 9 (or 18)

54 ÷ 9 = 6 and 36 ÷ 9 = 4

6:4 can be simplified to 3:2

1 mark for partial workings eg first 2 of the above stages

(h) **[AO2 = 3]**

1 mark for each of the following:

- Data is categorical/nominal/frequency
- The students are looking for a difference or an association between two variables
- Design is independent/unrelated or categories are exclusive (observations cannot appear in more than one cell)

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

1 mark for the correct answer: df = 2

Plus

1 mark for correctly substituting values into the formula as follows:

(2 − 1) x (3 − 1) = 1 x 2 = 2

(j) **[AO2 = 3]**

1 mark for each of the following:

- Yes, the result is significant
- Because the calculated value of Chi-square is more than the critical table value at 0.05, either 4.60 or 5.99, depending on whether student uses one or two-tailed values
- One-tailed is consistent with the hypothesis and Q13, but there is an argument that the Chi-square test should always be two-tailed so either can be credited
- Where df equals 2

(k) **[AO2 = 4]**

Level	Marks	Description
2	3 – 4	The paragraph is clear and coherent, showing sound understanding of the concept of levels of significance and effective application to the context. There is effective use of terminology.
1	1 – 2	The paragraph shows some understanding of the concept of levels of significance and/or some relevant application to the context. The answer lacks clarity and coherence. Terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

- Explanation of levels of significance as an indication of the measure of the influence/effect of chance/random factors on the findings.
- With the present results there is a 95% confidence in accepting the research hypothesis/confidence that any difference/effect is due to the variables under investigation, in this case the location of the public spaces.
- There is a 5% possibility that the same frequencies would occur if there was no real difference between the two towns.
- The calculated value in this case well exceeds the critical value at 0.05 but does not meet the more stringent level of significance of 0.01.
- Possibility of type one error.

Credit other relevant material.

(l) **[AO3 = 3]**

1 mark for explaining that content analysis is suitable because the students are analysing recordings which are a form of media.

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Plus

2 marks for a clear, coherent account of how the content could be analysed

1 mark for a brief or muddled account of how the content could be analysed

Content:

Students could identify specific ideas/concepts that occur in the recordings

They could then set up a system of categories and tally the ideas/concepts

(m) **[AO3 = 1]**

1 mark for any relevant inconsiderate behaviour eg leaving rubbish, leaving dirty mugs/plates, playing music loudly, throwing books, shouting

Q7.

(a) **AO2 / AO3 = 3**

A suitable non-directional hypothesis would be 'There is a correlation (relationship) between pupils' scores on a test of mathematical ability and pupils' scores on a test of musical ability'.

3 marks for a fully operationalised non-directional hypothesis.
2 marks for non-directional hypothesis that identifies both variables but does not operationalise them.
1 mark for non-directional hypothesis where the variables are not identified.
No marks for a null or directional hypothesis or one referring to association or difference.

(b) **AO2 / AO3 = 3**

The main issue is that the teacher has made up her own test:

- This involved subjective judgement on the part of the teacher who rates the students' musical ability. Her judgement may not reflect real differences in musical ability and is likely to differ from other people's judgement and / or any absolute criteria for tunefulness.
- Lack of reliability in rating musical ability would compromise the validity of the measure.
- As the students can choose the song they will sing, the rating of ability could reflect the teacher liking / dislike of the song rather than the student's ability.
- The rating may be invalid as the students selected songs which varied in difficulty so the tunefulness reflected the difficulty of the song not the students' ability.
- Operationalising musical ability as tuneful singing is a very narrow measure. Someone can have musical ability such as playing an instrument which would not be reflected by this measure.

1 mark for identifying an appropriate reason.
2 further marks for elaboration, explanation of why it is a problem, how it might affect the result or for further reason(s).

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Note that 3 marks can be awarded for one reason elaborated or more than one reason in less detail.

(c) **AO2 / AO3 = 3**

In the case of the maths test candidates could refer to split half or test retest as methods of checking reliability. They could also refer to checking the reliability of scoring by using two separate markers for the test and comparing the scores. Credit any other appropriate suggestion.

1 mark for identifying an appropriate method or a brief explanation eg ‘repeat the maths test’.
2 further marks for appropriate elaboration.

(d) **AO2 / AO3 = 2**

The teacher chose to use a random sample because it would probably be more representative of the whole GCSE group than if she had used an opportunity or volunteer sample. Candidates could also say that she had ready access to her target population making it convenient for her to select a random sample.

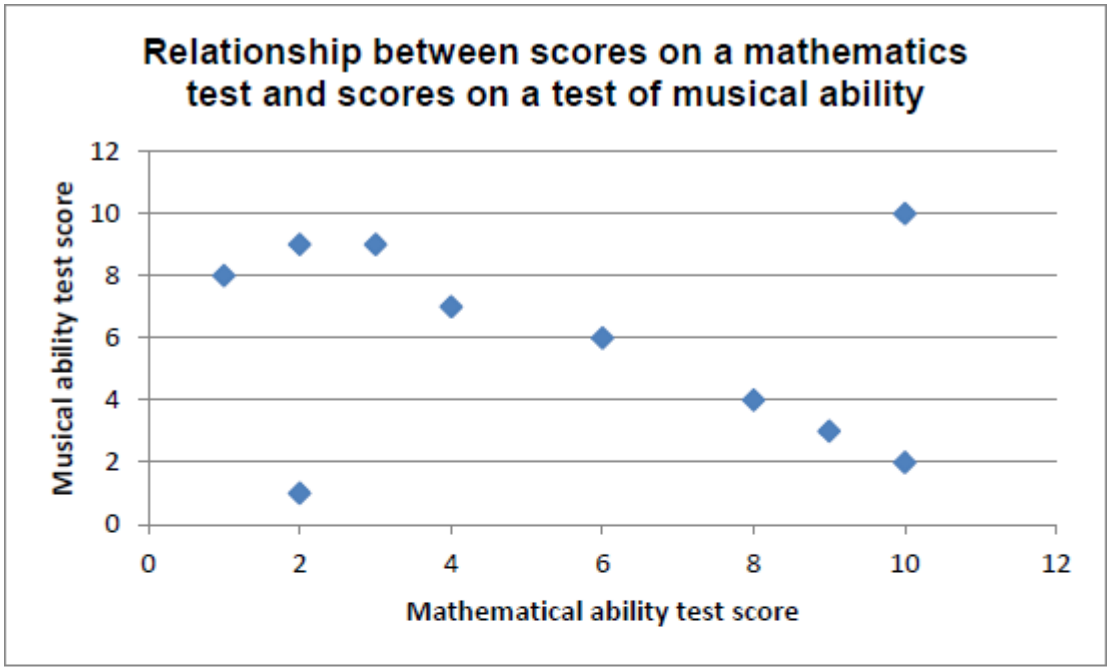
No credit for definition of a random sample.
1 mark for a brief or muddled reason (it is not biased).
2 marks for a reason that clearly points to an advantage of random sampling. This could be achieved through a comparison with another method (it is less likely to be biased than a volunteer sample).

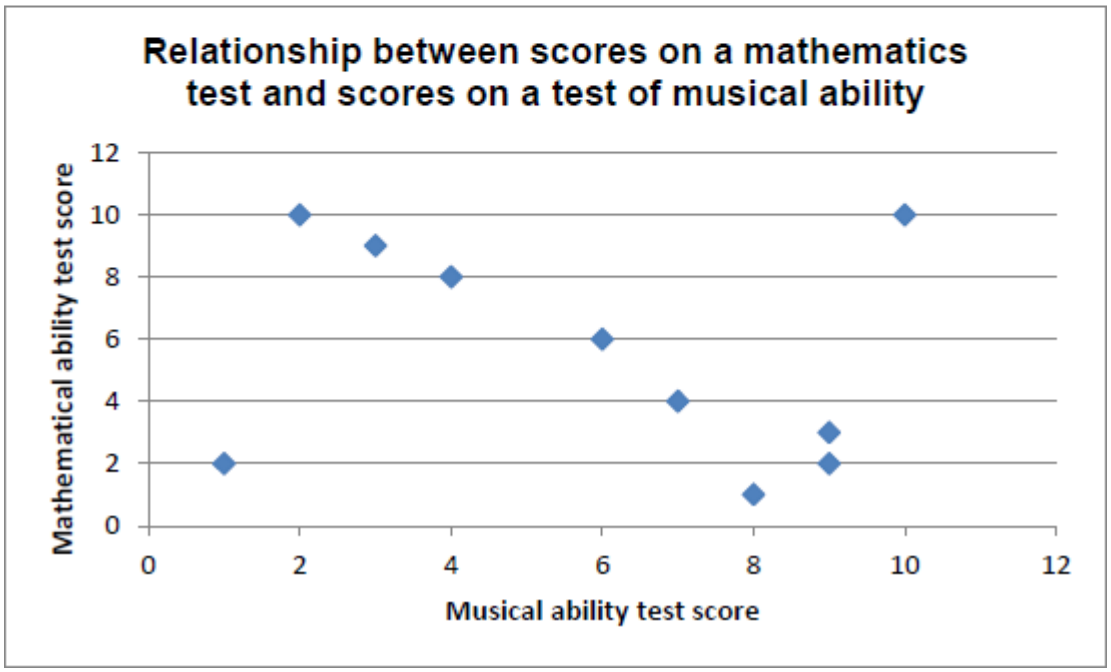
(e) **AO2 / AO3 = 3**

Credit should only be awarded for scattergraphs. Other graphs gain 0 marks.

1 mark for appropriately plotted scores.
1 mark for an appropriate title.
1 mark for correctly labelled axes.

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(f) **AO2 / AO3 = 3**

Up to 3 marks for a discussion of the relationship between mathematical and musical ability. Likely points include:

- The graph seems to show a negative correlation between mathematical and musical ability.
- This means that high scorers in mathematical ability tend to achieve low scores on musical ability and vice versa.
- The presence of two strong outliers, means that the actual correlation is very weak and closer to zero.
- Comment on the small sample size which limits the conclusions that could be drawn.

- Credit can be achieved for plausible interpretations of the strength of the correlation which are justified (ie looks moderate to strong or the outliers make it weak in practice) or those based on rough calculations (around -0.2).

1 mark for a very brief answer eg negative correlation or zero correlation.
2 further marks for elaboration/discussion this could be focused on one point in detail or several points in less detail.

(g) **AO2 / AO3 = 10**

In this question, candidates are asked to design a study to test if there is a difference between left-handed and right-handed students in musical ability.

Design – 1 mark

- Award 1 mark for identification of an appropriate design (independent measures or matched pairs).

Sampling – 2 marks

- Award 1 mark for explaining an appropriate sampling method and 1 further mark for justifying why this method would be appropriate. As left-handed people are less common in the population than right-handed people this needs to be addressed in the sampling method.

Procedure and assessment of musical ability – 4 marks

Award 1 mark for procedure, 1 mark for assessing musical ability and two further marks for elaboration of either or both of these.

- Description of the procedure eg each participant will be given a standardised musical ability test, participants should be tested within a controlled environment, with minimal noise or distraction.

- Students are required to suggest a plausible alternative method of assessing musical ability to the one in the stem (eg singing a short, novel phrase played on the piano). Further credit could be given for stating that the test should be identical for all students or for explaining how it will be assessed.

Debrief – 3 marks

- Award up to 3 marks for writing a debrief. This could include the aim of the study, thanking participants for taking part, asking if they have any questions, relevant ethical considerations.

- If this is not suitable to be read out to participants, maximum 1 mark.

(h) **AO2 / AO3 = 3**

Award 1 mark for a clear table appropriate for the study described in (h).

Musical ability scores:

Participant number	Left handed	Right handed
1		

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2		
3		

Award 1 mark for the identification of an appropriate statistical test for the proposed design.
Award 1 mark for one correct justification eg a test of difference, at least ordinal level data.

Q8.

Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

(a) **[AO3 = 2]**

One mark for an explanation.
Inform researcher of spread of scores.
One mark for link to the study.
The programme did not seem to affect people in each condition differentially as spread of scores in each condition is similar / large.
The offenders' anger behaviour showed a wide variation both before and after the programme.
Accept spread is greater in the after condition than before.

(b) **[AO3 = 2]**

One mark for statement that the result is significant.
One mark for rationale: the calculated value of *T* is 22 and is less than the critical value of 25 (at the 0.05 level of significance).
Can accept not significant at 0.02 level.

(c) **[AO3 = 3]**

Maximum of 3 marks can be obtained from: one mark for each reason or two marks for each reason with explanation.

- Reason – ordinal level of measurement / non-parametric
  Explanation – self reports / estimated scores of anger; data might not be normally distributed
- Reason – design of the study is related / repeated measure
  Explanation – same people before and after
- Reason – research involving differences between the 2 sets of scores
  Explanation – anger scores before and after

(d) **[AO3 = 4]**

Up to two marks for each reason and explanation. Likely points: as an aid to memory; a qualitative measure to supplement the quantitative data collected; to check the validity of the questionnaire; part of the therapeutic process /

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increased self-awareness.
Accept other valid reasons.
One mark for an appropriate reason and one mark for an explanation of the reason.

(e) **[AO3 = 3]**

Up to three marks for outlining how a control group could have improved this study: it is not possible to tell if the programme has caused the improvement; improvement could have been due to the programme or due to spontaneous recovery; by using a control group would make it more scientific; scores can be taken at the same times (pre-programme / post-programme) as in an experimental condition; post programme differences between the groups can inform if programme is effective; can be more confident in inferring cause and effect .

Allow a maximum of one mark for the general purpose of a control condition: acts as comparison / baseline measure where nothing changes

Accept 'scientific' and 'validity' only if justified.

(f) **[AO3 = 5]**

Up to 5 marks for addressing both reliability and validity. One of these marks must be for reference to statistical testing.

A maximum of three marks if only one of these is addressed.

One mark for identifying a type of validity: face validity; concurrent validity.
Accept also content validity; criterion validity; predictive validity.
Only accept identification mark if it matches how the assessment would be carried out.

One mark for outlining how the assessment would be carried out. For example in concurrent validity, scores from the questionnaire are compared with those from an established but similar questionnaire known to have good validity to see if the results are similar.

One mark for the statistical testing (checking for a positive correlation / applying Spearman's rank order correlation).

One mark for identifying a way of assessing reliability. Most likely is test-retest but accept split-half reliability and item analysis.
Only accept identification mark if it matches how the assessment would be carried out.
Do not accept inter-rated / inter-observer reliability.

One mark for outlining how the assessment would be carried out. For example in test-retest, the same group of young offenders would be tested using the same questionnaire at a later date to see if the findings remained consistent.

One mark for the statistical testing (checking for a positive correlation / applying Spearman's rank order correlation).

The one mark for statistical testing can only be credited once.

Q9.

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Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

(a) **AO2 / AO3 = 1**

One mark for an accurate reason: The decision to use a directional hypothesis was based on findings of previous research which pointed to an effect in a particular direction ie memory is poorer with age.

(b) **AO2 / AO3 = 3**

A suitable directional hypothesis would be 'There is a negative correlation (relationship) between age and recall accuracy rating'.

- 3 marks for a fully operationalised hypothesis as above
- 2 marks for a directional correlational hypothesis that identifies age and recall as the two variables but is not fully operationalised
- 1 mark for a directional hypothesis where the variables are not identified (‘there will be a negative correlation’) or where the hypothesis lacks clarity.

Award zero marks for a non-directional or null hypothesis or any hypothesis predicting a difference or association.

(c) **AO1 = 1**

One mark for an accurate definition: The extent to which results or procedures are consistent or simply 'consistency'.

(d) **AO2 / AO3 = 3**

One mark for identification of a way of ensuring reliability. By far the most likely answer here is inter-rater reliability.

Two marks for some explanation/elaboration: using two separate psychologists and comparing them.

Three marks for an accurate and clear explanation: using two separate psychologists to rate the typed accounts for accuracy and comparing / correlating the ratings to see how similar they are.

Candidates could make a case for test retest which would involve the same psychologist re-examining the ratings after a period of time.

(e) **AO2 / AO3 = 2**

Award one mark for correct identification of one of each type of data.

- Qualitative data: the patient’s responses, the typed accounts, the doctor’s notes.
- Quantitative data: the ratings of recall accuracy on a scale of 1 – 10, ages of patients.

(f) **AO2 / AO3 = 2**

One mark for each accurate reason given:

- the researchers are testing for a correlation or a relationship between two variables.

- the data is to be treated as ordinal because the recall accuracy is in the form of ratings.

(g) **AO2 / AO3 = 2**

One mark for stating that the result is significant.

Second mark for explaining that -.52 exceeds .306 ($p \leq 0.05$, n=30 for a one-tailed test).

(h) **AO1 = 2**

One mark for a brief or muddled answer which hints at rejecting HO / accepting the H1 in error.

Two marks for explaining the term: where the researcher rejects the null hypothesis (or accepts the research / alternative hypothesis) when in fact the effect is due to chance – often referred to as an error of optimists.

(i) **AO2 / AO3 = 3**

3 marks for a clear explanation which is based on comparison of the calculated value of rs with the critical value at the 0.01 level of significance and indicates competence in use of statistical tables as follows:

- A Type 1 error is unlikely because the calculated value of rs (-0.52) exceeds the critical table value at both the 0.05 and 0.01 level for a one-tailed test.

- The chance of a Type1 error occurring is therefore less than 1%.

- This means that the researchers can be 99% certain that the results obtained are not due to chance.

Award one mark for a brief explanation (it is significant at 0.01).
Award two further marks for an explanation which refers to two of the above points.

Award one mark for stating that the obtained value (-0.52) exceeds the critical value (0.306) by a reasonable margin.

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Q1.

This was a well-answered question with almost 90% of students achieving two or three marks. Most students knew disadvantages of questionnaires but lacked an understanding of observations, often stating that they were better as the *"researcher could see for themselves"*. Weaker students merely paraphrased the stem, stating *"people's perception of how they spend their time in the gym is often not very accurate"*.

Q2.

Students generally did reasonably well on this question. Types of observation were generally understood and justified. Weaker responses sometimes lacked detail/explanations. Behavioural categories were generally poor and operationalisation was rarely evident. Time/event sampling was often stated but for their use was absent or muddled. Confusion was often evident, particularly in relation to time sampling (often mistakenly presented as how long a behaviour lasted). Reliability was often covered well with detailed descriptions of inter-rater reliability given. However, test-retest was frequently suggested inappropriately as a way of assessing reliability and students confused the purpose of assessing reliability with ensuring reliability. Unfortunately, students frequently focussed on additional material, such as ethical issues, sampling of participants, etc, at the expense of covering all the bulleted requirements successfully. Furthermore, some students designed a complete study and a few wrote a whole report, including abstracts, statistical analysis, etc. However, these did not receive credit.

Q7.

(a) Hypothesis writing continues to be problematic for many students, despite the requirement to do this at AS level. Around 40% of students achieved zero marks on this question , having mistakenly written a directional hypothesis or one which predicted a difference between mathematical ability and musical ability as opposed to a relationship. Many responses lacked clarity or failed to operationalise the variables sufficiently. The best answers were concisely and clearly worded such as "There is a correlation (relationship) between pupils scores on a test of mathematical ability and their scores on a test of musical ability", which achieved the full 3 marks.

(b) This question was answered well, with most students scoring two or all three marks. Weaker students were able to spot the test was based on a subjective judgement and some also made the point that singing was a poor measure of all round musical ability. Stronger students identified the lack of control (different choices of song) and were able to link this appropriately to investigator bias. Some students also made the point that the test lacked validity as it had not been standardised.

(c) There was a broad range of answers to this question and about 40% of students achieved no marks at all. Some confused reliability with validity, suggesting various methods such as comparing the scores with another measure of maths ability. Few contextualised this by identifying alternate forms which would have been creditworthy. Others made reference to running a pilot study which received no marks.

The remaining 60% had some idea of ways of assessing reliability of the maths test, the most common methods being test-retest and split-half. Some used inter-rater reliability appropriately suggesting that two separate markers could be used for the maths test: others became sidetracked into assuming that the study was

observational. Stronger students were able to explain two or three methods of checking reliability in reasonable detail.

(d) This straightforward question on a random sample caught out quite a few students. Most were able to achieve 1 mark by referring to the method as being likely to yield a more representative sample. The weakest students simply defined random sample and went no further.

(e) This question required students to draw a scatter graph to display the data. About half achieved all three marks here. Many students failed to gain full marks by inaccurate or missing labels or title. About one third of students drew an incorrect graph, the most common error being to draw a bar chart.

(f) Most students were able to make some commentary on the generally negative correlation shown in the graph and table. Better students noted the presence of two outliers which weakened the overall strength of the relationship and some commented on the impact of outliers in a small sample. A small number of students made a rough calculation of Rs which was impressive but unnecessary to gain full marks.

(g) This question had a range of answers from students that covered marks from 0-10. The mark scheme allowed students to argue for different ways of designing the experiment (independent measures or matched pairs) and of generating a sample (volunteer or random selection from the two groups) provided these were workable and justified. Some common errors included:

- suggesting an inappropriate design (repeated measures) which did not take account of the information relating to left and right handers
- suggesting a sampling method but not explaining how it would yield an appropriate sample of left and right handers
- assuming that a maths test also needed to be completed (ie incorrect IV)
- failing to provide any procedural information
- producing a debrief which was not suitable to be read out to participants
- providing standardised instructions and claiming they were a debrief.

Some schools and colleges had clearly prepared their students well and many showed an impressive understanding of experimental design. Others struggled with the question and/or, failed to read the instructions and therefore gained very few marks. Once again, advice to teachers is: to do practical work. It was clear that some students were very familiar with designing experiments and they had a strong advantage here.

(h) This question required students to follow through their design from (g) and give some indication of how the data would be recorded and analysed. Most managed to sketch an appropriate table to record data, although a few misread the question and produced a summary table. Some students were able to follow through their design / data type with an appropriate test which could have been Mann Whitney (independent design) or Wilxocon (matched pairs). Students who had collected nominal data or recorded data in nominal form were credited if they suggested chi square to analyse it.

Q8.

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(a) Students often struggled with this question. Very few understood why measures of dispersion are used in addition to measures of central tendency and a number used the term ‘dispersed’. Applications to the stem lacked the necessary detail to attract a mark.

(b) Many students were able to make correct use of the table and draw an appropriate conclusion about the statistical significance of the T value. Stronger students were able to present this information well, with some even correctly stating that the results were not significant at the 0.02 level and explaining why. A few less successful students were confused about the critical and calculated values of T.

(c) It was heartening to see so many students being able to explain why this test was used, with many students scoring the full 3 marks. A few students, however, stated that the data was nominal or interval.

(d) Most students were able to score at least one mark on this question even if they scored poorly on preceding and subsequent questions. Students had to think carefully about this answer and many were able to suggest one or two sensible reasons for the use of a diary by each offender. Elaboration and explanation of each reason proved more of a challenge, sometimes resulting in overlap and repetition across the two reasons offered. Some students simply repeated the stem.

(e) This question produced some answers that showed a lack of understanding of the use of a control group with quite a few students suggesting that a control group would consist of ‘a group of non-offenders’ or ‘normal people / people with no anger issues from a normal population’. More informed students were able to explain why a group of people who would not have the anger management programme would have improved the study although some simply said that ‘it would make it more scientific’ without explaining why.

(f) Answers to this question were most disappointing with almost two fifths of students failing to score a single mark. What should have been a straightforward question proved challenging for many students who seemed unfamiliar with how to establish the reliability and validity of the questionnaire. Some students confused reliability with validity, others simply provided definitions of each and, where an attempt was made to apply reliability and validity to the stem, students very often referred to pilot studies and peer review. Reliability was sometimes mistaken for replicability, the ‘split-half method’ was frequently explained as dividing the total score in half to see if the two halves correlated and test- retest was sometimes explained as testing one group of offenders and retesting another group of offenders. Face validity was rarely applied to the questionnaire ie anger scores. Even students who correctly addressed the issues of reliability and validity, failed to explain how statistical tests of correlation would be used in this context. The value of carrying out practical activities to enable students to ‘think like a psychologist’ and apply their knowledge of practical activities in answer to questions such as this one cannot be overstated. It is clear that where students had been presented with such opportunities, they were able to write confidently and in an informed manner.

Q9.

(a) This question was answered well with most students aware that a directional hypothesis was appropriate due to the existence of previous research. A minority of students provided rather more detail than required for one mark.

(b) Hypothesis writing is still a problematic area for many students, despite the requirement to do this at AS level. Many students achieved zero marks on this question, having mistakenly written a non-directional hypothesis or one which

predicted a difference between older and younger patients. Many responses were lacking in clarity or failed to operationalise recall adequately. The best answers were concisely and clearly worded such as “There is a negative correlation (relationship) between age and recall accuracy rating”, which achieved the full three marks.

(c) Although this question was worth only one mark, many students produced lengthy answers. Some distinguished between specific types of reliability such as external or internal. A small number of students became confused between validity and reliability.

(d) There was a broad range of answers to this question, with students in roughly equal measure being awarded marks across the full range. The majority had at least a rough idea of ways of assessing reliability (the most common being inter-rater) but found it difficult to select an appropriate method for the study detailed. The weakest answers were those where the student focussed on reliability of the study overall, rather than reliability of the ratings which was what the question required. Answers that achieved the full three marks generally selected the most straightforward idea; to take two independent psychologists who rated the typed accounts separately and then correlated their ratings. Students who achieved only one mark suggested test retest as a method but most were unable to carry this through and indicate that the psychologist would need to return to the data after a suitable interval and re-rate the accounts.

(e) This question was answered well with the majority of students achieving two marks. There was a range of both kinds of data to draw on here including the doctor’s notes and the patients responses (qualitative data) and ages and accuracy scores (quantitative data).

(f) Answers to this question demonstrated an understanding of the use of the Spearman’s rho statistical test with the majority of students achieving two marks.

(g) This question confused many students who were unaware that the critical value relates to the magnitude of rho not the direction. So negative correlation drops the minus sign when compared with the critical values. About half of students were clearly aware of this and could compare the obtained value with the correct figure from the table. The remainder made a number of errors, some comparing -.52 with 0.05, others claiming that the figure was smaller than .306. Some incorrectly used the values relating to a non-directional hypothesis.

(h) Full marks were achieved by stating that the null is rejected and the experimental hypothesis accepted, when in fact results are due to chance. Good understanding was shown among students who referred to the level of significance being set too leniently or the 5% likelihood of a Type 1 error occurring with the 0.05 level of significance. In about one in three cases students confused Type 1 and Type 2 errors.

(i) This question was challenging for students with many achieving no credit or not answering the question. Even students who were able to explain what was meant by a Type 1 error were unable to apply this knowledge in this question and compare the obtained value with the 1% significance level. A small number gained one mark for identifying that the obtained value was substantially larger than .306. However, far too many relied on a rote learned response that the 5% significance level avoids Type 1 errors therefore one could not have occurred.

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