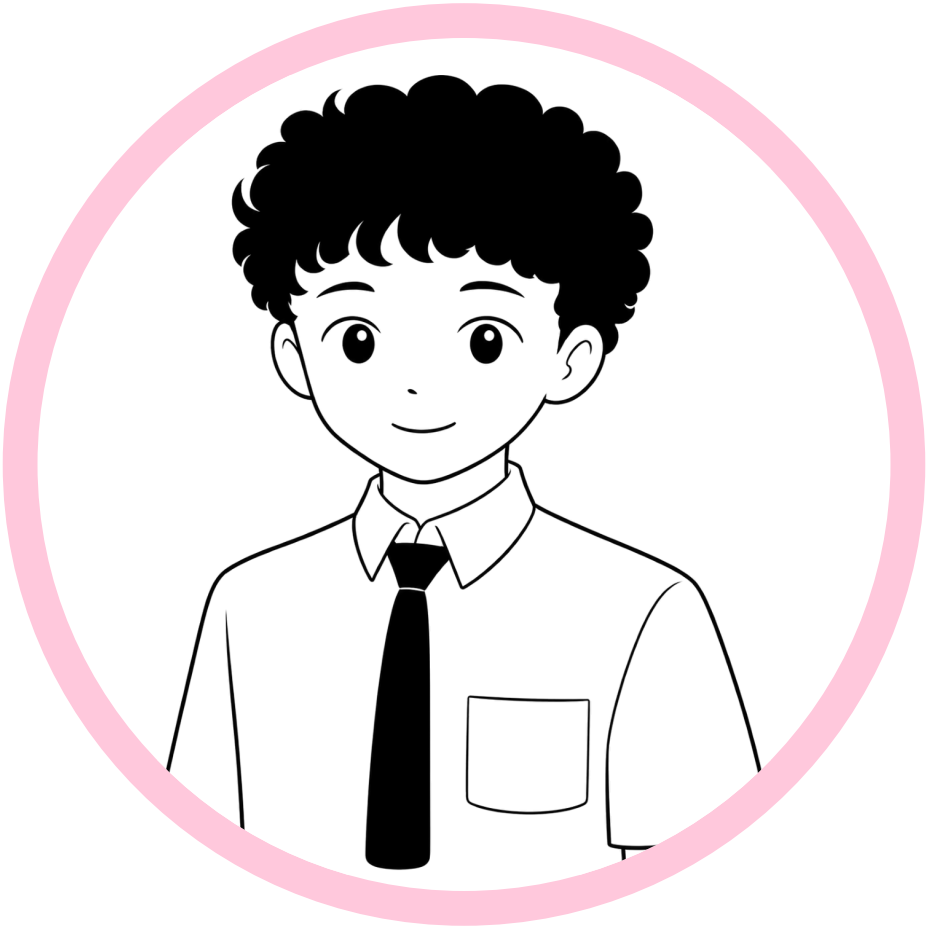
AQA A-LEVEL PSYCHOLOGY · 7182

PSYCHOLOGY



MARK SCHEME

3.2.3.1 FEATURES OF SCIENCE

SCORE	PERCENTAGE
/52	%

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Q1.

[AO1 = 2]

Possible content:

- The likelihood of the same differences occurring twice (or more), by chance alone are much smaller than when they occur the first time.
- Effects that occur in a study are more likely to be reliable if they occur in a repeat of the study – replication therefore increases (external) reliability.

Q2.

[AO3 = 3]

Up to three marks for explaining how the psychodynamic approach as depicted in the stem neglects the rules of science. Students may offer a brief elaboration on two or more rules of science identified in the study as 'neglected' or may choose to elaborate on a single one. Likely answers: interpretation of content of dreams open to bias and subjectivity; no verifiable evidence; small sample; opportunity sample of friends and implications for generalizability; qualitative data collected and implications for statistical analysis; retrospective data / memory distortions – reports written on waking; dreams are private experience and covert; problem of replicability. Credit other possible answers if made relevant to the scenario, eg no reference to a testable hypothesis.
Markers should be aware that some of the above points may overlap and should look for a coherent answer for full marks.

Q3.

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.

[AO3 = 3]

One mark per outline of a way: each identified feature of the scientific approach explained in relation to the study.
Possible features from the study: measuring levels of hormones; use of saliva samples; sample of 40 participants; prediction based on theory; statistical testing. Accept other features that can be inferred eg replication.
Explanations might refer to: empirical method; factual, verifiable, objective measures; precision / measuring on interval / ratio scale; operational prediction / testable hypothesis derived from theory; theory amenable to scientific testing; possible to replicate the procedure; theory capable of refutation; sample size.

Markers should be aware that some of the above scientific principles may overlap.
1 mark for two or more features and / or scientific principles named but not explained.

Q4.

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

Although the essential content for this mark scheme remains the same, mark schemes for the new AQA Specification (Sept 2015 onwards) take a different format as follows:

- A single set of numbered levels (formerly bands) to cover all skills
- Content appears as a bulleted list
- No IDA expectation in A Level essays, however, credit for references to issues, debates and approaches where relevant.

AO1 = 5

Replicability is the ability to check and verify scientific information.

Candidates could explain replicability as:

- the ability to repeat the method to assess if similar findings are achieved
- the ability to achieve similar findings.

Award 1 mark for a brief definition of replicability.

Tautological definitions eg merely stating that 'replicability is the ability to replicate' should not be awarded credit.

Replicability is an important part of the scientific process. Scientific method involves defining a problem and formulating a hypothesis which is tested with empirical research. Research findings are an important part of this process. If we wish to draw conclusions from research studies, the procedures and findings should be repeatable. Unrepeatable results may imply flaws or lack of control within the method used and are of limited use in theory construction.

Award up to 4 marks for an explanation of why replicability is important. This is likely to be contextualised within a description of the scientific method.

AO1 mark bands	
4 marks	Explanation is sound
3 marks	Explanation is reasonable
2 marks	Explanation is basic
1 mark	Explanation is rudimentary
0 marks	No creditworthy material

Q5.

[AO3 = 4]

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Allow one mark for outlining what is meant by replication: being able to copy the original experiment / research using the same methods and procedures in order to see if results are same or similar.
One mark for reference to method (doing the same way).
One mark for reference to results (if similar or not).

Up to two marks are for explaining the role of replication in the scientific approach. Candidates may focus on two reasons briefly or may choose to elaborate on a single reason. Possible points: increases confidence in results; theory strengthened through repeated attempts at refutation / falsification; reliability / consistency of findings supported; a condition of validity; generalisability increased.
Credit answers embedded in an example.

Q6.

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.

Although the essential content for this mark scheme remains the same, mark schemes for the new AQA Specification (Sept 2015 onwards) take a different format as follows:

- A single set of numbered levels (formerly bands) to cover all skills
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- No IDA expectation in A Level essays, however, credit for references to issues, debates and approaches where relevant.

(a) **AO2/3 = 6**

Candidates need to show that they understand what differentiates opinion from scientific evidence. They could mention some of the following:

- The teacher has only experienced one school in a particular catchment area so she has only observed a very limited number of 5 year-olds (issues of sampling and replicability).
- She has found out that children do not eat anything nourishing simply by chatting with the children. She has no corroborative evidence from eg parents (issues of objectivity).
- She uses vague phrases such as ‘decent breakfast’ without being clear what this means (operationalisation).
- She has generated a theory and made predictions based on flimsy evidence.
- She has not used any scientific method to lead to her conclusions eg a carefully controlled experiment, survey or observation.
- She has drawn conclusions about the effects of breakfast without considering other variables which might affect reading skills and behaviour.

AO2/3 Mark bands
6 marks Effective

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Explanation demonstrates sound understanding. Application of knowledge is effective and shows coherent elaboration. Ideas are well structured and expressed clearly and fluently. Consistently effective use of psychological terminology.
5 – 4 marks Reasonable Explanation demonstrates reasonable understanding. Application of knowledge is reasonably effective and shows some elaboration. Most ideas appropriately structured and expressed clearly. Appropriate use of psychological terminology.
3 – 2 marks Basic Explanation demonstrates basic, superficial understanding. Application of knowledge is basic. Expression of ideas lacks clarity. Limited use of psychological terminology.
1 mark Rudimentary Explanation is rudimentary, demonstrating very limited understanding. Application of knowledge is weak, muddled and may be mainly irrelevant. Deficiency in expression of ideas results in confusion and ambiguity. The answer lacks structure, often merely a series of unconnected assertions.
0 marks No creditworthy material is presented.

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

In a random sample, every member of the identified population has an equal chance of selection. In this case, the sampling frame consists of the 400 five-year-old children attending ten local schools. In order to obtain a simple random sample, the researcher has to have the names of all 400 children and can then select using one of the following methods:

- **Random number tables** – random number tables are specially devised to meet the following criteria – they contain strings of numbers where each number has the same chance of being selected as any other and each number is independent of the others.
  Such tables are readily available in statistics text books etc or can be generated by the researcher using a computer program. The researcher assigns each child a number between 1 and 400. He enters the table at any place (he could close his eyes and point with a finger at a starting place) and then moves either horizontally or vertically to produce a string of random numbers. He records all the numbers which correspond to the 400 children until he has recorded a total of 100 non-duplicated numbers.

- **Computer selection** – This is a similar method where the computer does most of the work. A computer can generate an endless string of random numbers ie numbers which have no relationship to one another as a sequence. Each child's name is given a number and a random number generator program is used to produce the required sample size (in this case 100 participants).

- **Manual selection** – Using this method, the researcher has to put each name (or an assigned number) on a separate slip of paper and place them all in a container. The researcher then selects 100 slips from the container. The following conditions could apply: the container should be shaken between each draw; the slips of paper should all be the same size and folded in the same way so that one does not feel different from another; the selector draws

'blind' ie cannot see the actual slips of paper.

A simple definition of a random sample is not credit-worthy since it offers no explanation.\ Similarly, answers which only use the word 'random' as an explanation cannot gain credit eg He would choose 100 participants at random from the children. One mark for a very basic method eg 'he would take names from a hat / computer / random number table'. Two further marks for elaboration.

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

Candidates could focus on:

- Even if a sample is random, it may not be truly representative of the population eg might all come from the same school, or be all boys or all girls.
- Practical limitations eg the time and effort needed to write out 400 slips for the manual method.
- Difficulties of obtaining a truly random sample eg even if the sample is selected randomly, parents might refuse to allow their children to participate.

Any plausible and appropriate answers should be credited.
Up to 2 marks for identification of limitations. For 3 marks, one or more limitations must be explained in reasonable detail.

(d) **AO2/3 = 5**

There are two requirements to this question, **why** operationalising variables is important and **how** to operationalise the IV and the DV. If a candidate only explains **how / why**, maximum 3 marks.

The terms' 'decent breakfast' and 'reading skills' are vague. It is important from the point of view of objectivity, replicability and control of extraneous variables to make sure that these terms are closely defined.

Suggestions as to how the psychologist might do this could include the following:

The researcher needs to specify the exact composition of the breakfast (possibly by doing a pilot study or a literature search to identify the components of breakfast most likely to bring about behavioural / cognitive change). He probably also needs to specify the time at which it is consumed. The researcher needs to use a standard reading test which should be administered to all the participants at the beginning of the study and at the end – the dependent variable is likely to be the improvement score.

(e) **AO2/3 = 2**

Reasons are:

- a test of difference
- data (scores from a reading test) are at least ordinal, this would include ordinal / interval and / or ratio
- independent design.

One mark for each appropriate reason (maximum 2 marks).

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(f) **AO2/3 = 2**

It would have been more difficult to use a matched-pairs design because of the number of relevant factors that would need to be controlled (eg gender, intelligence, parental attitudes / income / education, experience of pre-school education, number of siblings in family etc). There is a relatively small pool of children available (ie 400) and it could be difficult to match on all these factors. It would also be very time-consuming; it could be quite expensive to carry out the necessary surveys; it could be quite intrusive collecting such information from parents.

One mark for a basic explanation eg “Because it is difficult to match participants appropriately”.
One further mark for elaboration.

(g) **AO2/3 = 2**

One mark for identifying an appropriate issue and second mark for explaining how it could be addressed.

The most likely issue is confidentiality which could be addressed by ensuring that all scores on reading scales and all personal information are anonymised.
There are also ethical problems involved in denying the control group breakfast although it is more difficult for candidates to suggest a way of addressing this – perhaps to put only those children into the control group who do not eat breakfast anyway, restricting the study length to a short period of time and, if the study results support the hypothesis, to provide free breakfasts to these children for the rest of the academic year.
Parental consent is excluded because it is given in the stem so answers which offer this as an issue cannot gain credit.

(h) **AO3 = 12**

Design should be written clearly, succinctly and with sufficient detail for reasonable replicability.
Candidates will not receive credit for details included in the stimulus material. These include using a random sample of 100 children, gaining parental consent and selection of a Mann Whitney test.
To access marks in the top band candidates must state an appropriate hypothesis in which “playground behaviour” is clearly operationalised. The hypothesis could be directional or non-directional.
Given the wording of the question, a correlational hypothesis is not credit-worthy, however, the rest of the answer should be marked on its merits.
Likely aspects of “playground behaviour” would include activity levels, aggression, cooperative play etc.
An attempt to operationalise “a healthy breakfast” should be credited. However, candidates could assume this had already been done by the psychologist.

As this is an observational study any of the following, together with appropriate justification, would be credit-worthy:
Is the observation covert or overt?
Where are observers positioned? (In playground, watching from window?)
Is a video recording of the children used? How will this be analysed (eg content analysis)?
Do the students who observe know what the children ate for breakfast?
At what times of day does the observation take place?
How many children are observed? (Candidates could justify using a smaller sub-sample of the 100 children in the original study).

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How long does each observation last?
Will the observers use a behavioural check list / tally chart?
Will more than one observer observe each child? If so, what training will be given and what checks for inter-observer reliability will take place?
Reference to time sampling or event sampling.

Credit any other relevant material.

AO2/3 Mark bands
12 – 10 marks Effective design A design that demonstrates sound knowledge and understanding of observational research. The selection and application of research techniques is appropriate. The description provides sufficient detail for most aspects of the study to be implemented. Some design decisions are justified effectively.
9 – 7 marks Reasonable design The design is reasonable and demonstrates knowledge and understanding of some aspects of observational research. The selection and application of research techniques is mostly appropriate. The description provides sufficient detail for some aspects of the study to be implemented. Some design decisions are justified.
6 – 4 marks Basic design The design is basic and demonstrates limited knowledge and understanding of aspects of observational research. The selection and application of research techniques are sometimes appropriate. Some basic design decisions/features of the study are described but there may be significant omissions, lack of clarity and possibly some implausible suggestions that severely limit implementation. Justifications of the design are limited.
3 – 1 marks Rudimentary design The design is rudimentary. Design decisions are muddled and or mostly inappropriate and are not justified. Description lacks clarity. The study could not be implemented.
0 marks No creditworthy material.

Q2.

Many students answered this question well, often gaining full marks. There were a number of students who clearly demonstrated knowledge of how psychodynamic psychologists neglect the rules of the scientific approach but failed to link the points made to the stem. The question clearly required ‘reference to the study above’ and without linking the concepts (e.g. implications of generalising from small samples, bias, subjectivity, etc) to the scenario outlined in the ‘dream diary’, no marks could be accessed. This was a shame and is indicative of the need of students to read the question carefully and address the requirements of the question.

Q3.

This question was answered well by the majority of students as most were able to refer to three ways in which the study was scientific. Where full marks were not awarded, this was usually because students had only named or identified ways in which the study was scientific rather than providing an outline. Some students only gained one mark, as scientific principles were named but not explained in relation to the study.

Q4.

This question was problematic for the majority of students with an average mark of 2 / 5 and only about 15% achieving 4 or 5 marks. Whilst most were able to provide some definition of replicability, few were able to explain in any detail why replication is an important part of the research process. Weaker students asserted that replication means that a study is reliable and / or valid. Stronger students contextualised replication in a discussion of the scientific method and referred to the importance of repeating studies to check for methodological flaws or investigator biases and some considered the importance of replication in supporting or refuting theories. Those who were able to provide a clear overview of the scientific process fared best.

Q5.

Students seemed to have a reasonable understanding of replication in relation to finding similar results, although only a few mentioned repeating the study in the same way or similar way, such as repeating the same method or procedure. Students who referred to ‘replicating’ the method or procedure did not gain credit. On the whole, students fared better with the second part of the question which required application to the scientific approach. However, some students failed to grasp that replication is a condition for validity but does not on its own confirm validity.

Q6.

(a) A challenging question because candidates needed to apply their knowledge. They often knew about what makes something scientific (objectivity, replicability, etc) but seemed unable to engage with the stem. There were lots of answers involving paradigm shift, which were not relevant to this question.

(b) Most candidates had some idea about how a random sample could be obtained, but often failed to explain the methods fully. They could suggest all the names should be put in a hat, but did not make it clear that the names were then selected “without looking” or “without bias”. There was some confusion with systematic sampling.

(c) Many answers displayed some confusion here, eg saying that a limitation was that it was not representative of the whole population, when the point is that is might not be representative of the target population of 400. Some answers referred to problems of allocation to conditions, rather than random sampling. A good point was made by those who said that if some parents did not give consent, the psychologist would have to select again, and that would not be random.

(d) This question was not answered well. Most candidates seemed very unclear about why it is important to operationalise variables. How to actually operationalise the two variables was beyond many candidates. Some effective answers referred to food content eg fat, sugar etc.

(e) Most candidates answered this correctly.

(f) There was some serious confusion about what exactly matched pairs design is. Few could go beyond “it’s time consuming” or “difficult to match on all variables”. Some referred back to the random sample and said it would not be possible; others felt that at five-years-old children are either too similar to match or too different.

(g) Most could identify an ethical issue such as confidentiality, the right to withdraw and protection from harm (those who did not get any breakfast or who were embarrassed at their poor reading). Some seemed to forget that they also had to explain how the issue would be dealt with, or they simply repeated that the right to with draw could be dealt with by giving the right to withdraw.

(h) This question was not answered well. Many candidates failed to read the question carefully before they attempted it. They were given the information that they were using the same group of children (ie the 5-year olds in the previous study). Despite the fact that the ethical issues and sampling had already been addressed in the plan for the original study many wrote at great length about sampling and ethics. The majority of candidates were unable to write a fully operationalised hypothesis, and often simply restated the aim. Many seemed to think the IV was breakfast versus no breakfast, rather than healthy versus unhealthy breakfast. Some of their ideas were totally impractical, especially given that the children were only 5 years old. In many answers lack of detail would have made any kind of replication very difficult. However, some candidates did understand the need for some sort of training for the observers, the need for clearly identified behaviour categories to record, and the importance of being able to distinguish the two groups in the playground. Designing a study is clearly a difficult task for candidates, and one that they need to practice.

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