AQA A Level Psychology
RESEARCH METHODS WORKBOOK
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INTRODUCTION

It is very important to pay attention to research methods, both in terms of revising and answering questions effectively in the exam, as it is worth 25% to 30% of your overall A Level grade.

The purpose of this booklet is to provide you with some additional research methods scenarios and questions to help you to prepare for your exams. There are nine scenarios in total, one for each of the nine research methods named on the specification:

- Laboratory experiment
- Field experiment
- Natural experiment
- Quasi-experiment
- Observation
- Correlation
- Interview
- Questionnaire
- Case study

Each scenario is followed by a series of questions worth 25 marks in total. If you want to practice under timed conditions, then you should allow yourself 30 minutes for each scenario.

The booklet begins with some very useful tips for answering research methods questions. There is also a scenario with some sample student answers and annotations.

Exam Hints: This booklet is packed full of exam hints and tips. These hints have been created by our experienced team of examiners and from the examiner reports. Pay careful attention to these hints as they will help you to maximise your performance in your future exams.

Answers: You can download example answers and mark schemes for all of the questions in this Research Methods Workbook from your my tutor2u account. These model answers have been checked by our team of examiners to ensure that they demonstrate how to write an achievable top level response, within the time constraints of the exam. Make sure you attempt each question before looking at the model answers! Visit: www.tutor2u.net/my
Top Tips

1. Read the scenario carefully and underline any key information. Candidates lose marks because they have not read the scenario properly.

2. Context is vital. If it says ‘in this investigation’, then you MUST contextualise your answers. Generic answers gain very few marks.

3. Do not confuse experimental methods (lab, field, natural and quasi) with experimental designs (independent groups, repeated measures and matched pairs).

4. It is very important to understand the difference between sampling techniques used to select participants for a study (e.g. volunteer sampling) and sampling methods used in observational research (e.g. event sampling).

5. Do not confuse findings with conclusions. Findings refer to the actual data found from the participants in the investigation; conclusions refer to what this data tells us about the behaviour of people in general.

6. When asked to write an experimental hypothesis, both the independent variable (IV) and the dependent variable (DV) need to be fully operationalised for full marks. When asked to write a hypothesis for a correlational study, both co-variables need to be operationalised for full marks.

7. Do not confuse types of data (qualitative/quantitative) with levels of measurement (nominal/ordinal/interval).

8. Learn a table, decision tree or mnemonic to help you decide which statistical test to use and why (see below).

<table>
<thead>
<tr>
<th>Test of Difference</th>
<th>Test of Association</th>
</tr>
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<tbody>
<tr>
<td>Related Design</td>
<td>Unrelated Design</td>
</tr>
<tr>
<td>Nominal Data</td>
<td></td>
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<tr>
<td>Sign test</td>
<td>Chi-squared</td>
</tr>
<tr>
<td>SIMON</td>
<td>COWELL</td>
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<tr>
<td>At Least Ordinal Data</td>
<td></td>
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<tr>
<td>Wilcoxon</td>
<td>Mann-Whitney</td>
</tr>
<tr>
<td>WANTS</td>
<td>MORE</td>
</tr>
<tr>
<td>Spearman’s rho</td>
<td></td>
</tr>
<tr>
<td>SINGERS</td>
<td></td>
</tr>
<tr>
<td>Interval Data</td>
<td></td>
</tr>
<tr>
<td>Related t-test</td>
<td>Unrelated t-test</td>
</tr>
<tr>
<td>(Parametric)</td>
<td>(Parametric)</td>
</tr>
<tr>
<td>RECEIVING</td>
<td>UNANIMOUS</td>
</tr>
<tr>
<td>Pearson’s r</td>
<td></td>
</tr>
<tr>
<td>PRAISE</td>
<td></td>
</tr>
</tbody>
</table>
A psychologist wanted to find out how mood affects how long people will wait before becoming impatient.

The psychologist recruited a sample of 30 students from the local university to take part in an experiment. They were told that they would be shown a short video that they would find interesting before taking part in an interview about the video. 15 of them were put in a good mood by being shown a 30-minute video of a comedy show and 15 were put in a bad mood by being shown an hour-long video about the poor state of the economy. After watching the video, each participant was taken to a waiting area and told that they would only have to wait a few minutes before being interviewed. They were also told that they could press a buzzer if they wanted anything while they waited.

The participants were left alone until they pressed the buzzer. They were then thanked and debriefed about the true purpose of the investigation. The psychologist measured the time (in minutes) that it took each participant to press the buzzer. A summary of findings is shown in the table below.

**Table 1: Mean time (in minutes) and standard deviations of the time taken to press the buzzer.**

<table>
<thead>
<tr>
<th>TIME TAKEN TO PRESS THE BUZZER</th>
<th>GOOD MOOD</th>
<th>BAD MOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>12.45</td>
<td>6.85</td>
</tr>
<tr>
<td>STANDARD DEVIATION</td>
<td>4.75</td>
<td>3.25</td>
</tr>
</tbody>
</table>

**QUESTION 1**

State an operationalised non-directional hypothesis for this investigation. [3 marks]

**Student Answer:** There will be a difference in the time taken (in minutes) to press the buzzer depending on whether the person is in a good mood or a bad mood.

**COMMENTS:** This answer is worth 2 marks. The hypothesis is non-directional, but only the DV is clearly operationalised. For full marks the student needed to say: There will be a difference in the time taken (in minutes) to press the buzzer depending on whether the person was in a good mood (the result of watching a 30-minute video of a comedy show) or in a bad mood (the result of watching an hour-long video on the poor state of the economy).

Furthermore, it is important to remember that any hypothesis, whether directional or non-directional, MUST be written in the present or future tense because it is a prediction of the outcome in a study.
QUESTION 2
Identify an appropriate sampling technique that could have been used in this investigation and explain how it could have been carried out. [3 marks]

**Student Answer:** Volunteer sampling could have been used. The psychologist could have put a poster in the college canteen asking for people to take part.

**COMMENTS:** This answer is worth 2 marks. The student has identified an appropriate technique and has provided a limited explanation for how it could be carried out. It is not clear what the potential participants would need to do. The answer could be developed by adding: ‘The poster would contain the e-mail address of the psychologist(s) and the first 30 people to make contact would be invited to take part’.

QUESTION 3
Identify the experimental design used in this investigation. [1 mark]

**Student Answer:** Independent groups design.

**COMMENTS:** This is the correct answer which receives 1 mark. The student has identified the experimental design and not the method (laboratory experiment). This is important because if the student had got this answer wrong they would have been awarded 0 for question 4 (see below).

QUESTION 4
Explain one strength of using this experimental design in this investigation. [2 marks]

**Student Answer:** One strength of using an independent measures design is that there are no order effects, as the person only sees one video but not the other.

**COMMENTS:** This answer is only worth 1 mark. The strength is explained, but the answer is not sufficiently contextualised. The student could have written: ‘There are no order effects as the participants have only been shown the comedy show or the video about the poor state of the economy. If they had seen both videos then the mood created by seeing the first video, might have affected their mood after seeing the second’.

QUESTION 5
What do the mean and standard deviation values in Table 1 suggest about the effect of mood on the time taken to press the buzzer. Justify your answer. [4 marks]

**Student Answer:** The mean values suggest that participants put in a good mood took longer to press the buzzer than those put into a bad mood. The standard deviation values suggest there is a greater spread of scores for participants who were put into a good mood than those put into a bad mood.
**QUESTION 6**
The psychologist was concerned about the validity of the experiment, suggest one possible modification to the design of the experiment and explain how this might improve validity. [3 marks]

**Student Answer:** One modification to the design of the experiment would be to use two videos of the same length as the comedy film was only 30 minutes long and the video about the poor state of the economy lasted an hour.

**COMMENTS:** This answer is only worth 1 mark. The modification given by the student would improve the validity but they have not explained HOW it might improve it. This is because they have focused on what was wrong with the original experiment. They needed to write: ‘One modification to the design of the experiment would be to use two videos of 30 minutes. This would improve validity because the length of the video would no longer be a confounding variable. In the original experiment, the participants who saw the video about the economy might have pressed the buzzer more quickly because they had already spent an hour in the laboratory’.

**QUESTION 7**
Identify an appropriate statistical test for the psychologist to use to analyse the data. Explain why this would be an appropriate test to use in this investigation. [4 marks]

**Student Answer:** The independent t-test would be an appropriate test to use. This is because the study is looking for a difference between the time taken to press the buzzer for the participants who saw the comedy video and the participants who saw they documentary about the poor state of the economy. An independent groups design has been used as the participants only saw one of the videos. The data is interval, as it is the time taken to press the buzzer.

**COMMENTS:** This answer is worth 4 marks as the student has identified an appropriate statistical test and explained clearly why it would be appropriate to use in this investigation. The candidate has given three reasons that are clearly contextualised. Please note that an alternative answer could have been the non-parametric Mann Whitney test, justified by saying the psychologist is looking for a difference, is using independent groups design and the data is at least ordinal. However, as the participants are all university students they come from a population that is unlikely to be normally distributed.

**OVERALL COMMENT**
This student has been awarded 13 out of 20 (65%). These are typical student answers as the student has failed to get marks due to not giving enough detail and not writing in the context of this investigation. Please try to avoid doing this when practicing with these questions and in your exams.
SCENARIO 1

DOES HUNGER AFFECT CONCENTRATION?

Two psychology students wanted to investigate whether hunger reduces concentration, as previous research has shown this to be the case. They decided to carry out an experiment using a repeated measures design where an opportunity sample of 20 sixth formers from their college were tested approximately 30 minutes before they had eaten their lunch and then again approximately 30 minutes after they had eaten their lunch.

The test required them to sit in front of a computer, read through a short passage of text and identify 10 simple grammatical errors as quickly as possible. Two passages were chosen that were a similar length and where the errors were comparable. The students completed the investigation on a computer in the same room, with the same level of heating and lighting. The time taken to correctly identify all 10 errors was measured in seconds by the computer.

QUESTION 1
The students proposed a directional hypothesis. Write a directional hypothesis for this experiment. [3 marks]

Answer:

QUESTION 2
Is it appropriate to use a directional hypothesis in this experiment? Explain your answer. [2 marks]

Answer:
QUESTION 3
Identify the type of experimental method used in this investigation. [1 mark]

Answer:

QUESTION 4
Explain one strength of using this type of experimental method in this investigation. [2 marks]

Answer:

QUESTION 5
Explain how demand characteristics might have occurred in this experiment. [2 marks]

Answer:

QUESTION 6
The students thought that their method of measuring concentration had good face validity. Briefly explain what is meant by face validity in this context. [2 marks]

Answer:
After they had completed their experiment, one of their friends pointed out that a problem with the experiment is that they did not use counterbalancing.

**QUESTION 7**
Explain why their friend thinks it would have been better to use counterbalancing in this experiment. [2 marks]

**Answer:**

**QUESTION 8**
Briefly explain why the psychology students could not carry out counterbalancing in this experiment if they wanted to test everyone on the same day. [2 marks]

**Answer:**

After they had completed their experiment, one of their friends pointed out that a problem with the experiment is that they did not use counterbalancing.

Another of their friends was concerned about the fact they used two different passages. They suggested that it might have been better to have used a matched pairs design instead of repeated measures.

**QUESTION 9**
Explain how a matched pairs design could have been used in this experiment. [3 marks]

**Answer:**

**Answer:**
QUESTION 10
The students decided to use a related t-test to analyse the data they collected. Explain why they decided to use this test. [3 marks]

Answer:

QUESTION 11
After analysis of the data, the students obtained a calculated value of 1.809. For the related t-test, df = N – 1. Using the table below, explain whether or not the psychology students will be able to accept their hypothesis. Justify your answer. [3 marks]

Answer:

<table>
<thead>
<tr>
<th>DF</th>
<th>0.05</th>
<th>0.025</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>1.740</td>
<td>2.110</td>
</tr>
<tr>
<td>18</td>
<td>1.734</td>
<td>2.101</td>
</tr>
<tr>
<td>19</td>
<td>1.729</td>
<td>2.093</td>
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<tr>
<td>20</td>
<td>1.725</td>
<td>2.086</td>
</tr>
<tr>
<td>21</td>
<td>1.721</td>
<td>2.080</td>
</tr>
</tbody>
</table>

Calculated value of t must be EQUAL to or GREATER THAN the critical value in the table for significance to be shown.
SCENARIO 1

**DOES HUNGER AFFECT CONCENTRATION?**

Two psychology students wanted to investigate whether hunger reduces concentration, as previous research has shown this to be the case. They decided to carry out an experiment using a repeated measures design where an opportunity sample of 20 sixth formers from their college were tested approximately 30 minutes before they had eaten their lunch and then again approximately 30 minutes after they had eaten their lunch.

The test required them to sit in front of a computer, read through a short passage of text and identify 10 simple grammatical errors as quickly as possible. Two passages were chosen that were a similar length and where the errors were comparable. The students completed the investigation on a computer in the same room, with the same level of heating and lighting. The time taken to correctly identify all 10 errors was measured in seconds by the computer.

**QUESTION 1**
The students proposed a directional hypothesis. Write a directional hypothesis for this experiment. [3 marks]

**Answer:** Participants tested 30 minutes after eating their lunch will identify 10 grammatical errors in a passage of text in a shorter time (measured in seconds) than participants tested 30 minutes before eating their lunch.

**QUESTION 2**
Is it appropriate to use a directional hypothesis in this experiment? Explain your answer. [2 marks]

**Answer:** A directional hypothesis is appropriate because the psychology students have found previous research showing that hunger affects concentration.
QUESTION 3
Identify the type of experimental method used in this investigation. [1 mark]

Answer: It is a laboratory experiment.

QUESTION 4
Explain one strength of using this type of experimental method in this investigation. [2 marks]

Answer: One strength of using a laboratory experiment in this investigation is that the psychology students will be able to have a high degree of control over extraneous variables that might also affect concentration. For example, they were able to keep the heating and lighting levels constant for all of the participants.

QUESTION 5
Explain how demand characteristics might have occurred in this experiment. [2 marks]

Answer: Demand characteristics may have occurred because the participants knew they were taking part in an experiment and it was a repeated measures design, so they were taking part in both conditions. This would have made it fairly easy to guess what the aim of the study was and they may have tried harder in the task after lunch to please the experimenters and find the errors faster.

QUESTION 6
The students thought that their method of measuring concentration had good face validity. Briefly explain what is meant by face validity in this context. [2 marks]

Answer: Face validity refers to whether the way the DV is measured in the experiment looks like it measures what it claims to measure. The students must think that finding ten errors in a passage of text while being timed appears to measure concentration.
QUESTION 7
Explain why their friend thinks it would have been better to use counterbalancing in this experiment. [2 marks]

Answer: It would have been better to use counterbalancing because the students have used a repeated measures design and this may have introduced order effects. The participants may have found the errors more quickly in the second condition due to practice, rather than because they had eaten their lunch.

QUESTION 8
Briefly explain why the psychology students could not carry out counterbalancing in this experiment if they wanted to test everyone on the same day. [2 marks]

Answer: The students could not carry out counterbalancing because it would involve half of the participants doing the test before lunch and then again after lunch and the other half doing the test after lunch and then again before lunch. This is not possible on the same day.

QUESTION 9
Explain how a matched pairs design could have been used in this experiment. [3 marks]

Answer: A matched pairs design could have been used by the psychology students pairing the participants on variables that might affect their performance in the investigation. For example, concentration levels and/or grammatical ability. They could have pre-tested the participants and then matched pairs who had similar scores and placed one in each condition. This would mean one member of the pair would complete the task before lunch and the other after lunch, allowing the same passage to be used.
QUESTION 10
The students decided to use a related t-test to analyse the data they collected. Explain why they decided to use this test. [3 marks]

**Answer:** The students decided to use the related t-test because they were looking for a difference in concentration before and after lunch. They had used a related design (repeated measures) and the data collected is internal level (times taken in seconds to identify the errors).

QUESTION 11
After analysis of the data, the students obtained a calculated value of 1.809. For the related t-test, df = N – 1. Using the table below, explain whether or not the psychology students will be able to accept their hypothesis. Justify your answer. [3 marks]

**Answer:** The students will be able to accept their hypothesis. This is because the calculated value of 1.809 is more than the critical value of t which is 1.729. This is the appropriate critical value where \( p = 0.05 \), \( df = 19 \) (20 - 1) and the students are making a one-tailed test.

<table>
<thead>
<tr>
<th>df</th>
<th>ONE-TAILED TEST 0.05</th>
<th>ONE-TAILED TEST 0.025</th>
<th>TWO-TAILED TEST 0.05</th>
<th>TWO-TAILED TEST 0.025</th>
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<tbody>
<tr>
<td>17</td>
<td>1.740</td>
<td></td>
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<td>21</td>
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<td></td>
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</tr>
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</table>

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SCENARIO 1

DOES HUNGER AFFECT CONCENTRATION?

Two psychology students wanted to investigate whether hunger reduces concentration, as previous research has shown this to be the case. They decided to carry out an experiment using a repeated measures design where an opportunity sample of 20 sixth formers from their college were tested approximately 30 minutes before they had eaten their lunch and then again approximately 30 minutes after they had eaten their lunch.

The test required them to sit in front of a computer, read through a short passage of text and identify 10 simple grammatical errors as quickly as possible. Two passages were chosen that were a similar length and where the errors were comparable. The students completed the investigation on a computer in the same room, with the same level of heating and lighting. The time taken to correctly identify all 10 errors was measured in seconds by the computer.

QUESTION 1
The students proposed a directional hypothesis. Write a directional hypothesis for this experiment. [3 marks]

3 marks for an appropriate, clear and coherent directional operationalised hypothesis.
2 marks for a statement with both conditions of the IV and the DV; the answer lacks clarity and coherence or only has one variable operationalised.
1 mark for a muddled statement with both conditions of the IV and the DV present; or where neither variable is operationalised.
0 marks for expressions of aim/questions/correlational/null/non-directional hypotheses or statements with only one condition of the IV present OR where the conditions are incorrectly described.

QUESTION 2
Is it appropriate to use a directional hypothesis in this experiment? Explain your answer. [2 marks]

1 mark for stating that it is appropriate to use a directional hypothesis.
Plus
1 mark for explaining that previous research has already shown that hunger affects concentration.
QUESTION 3
Identify the type of experimental method used in this investigation. [1 mark]

1 mark for laboratory experiment.
0 marks for repeated measures design or any other type of experiment.

QUESTION 4
Explain one strength of using this type of experimental method in this investigation. [2 marks]

2 marks for a clear and coherent strength of using a laboratory experiment in this investigation.
1 mark for a limited/muddled strength of using a laboratory experiment in this investigation.
0 marks for a generic strength not linked to the stem or a strength of a repeated measures design or any other type of experiment.

POSSIBLE STRENGTHS:
- Allows the students to have a high degree of control over extraneous variables that might affect concentration.
- Would allow the students to replicate the research to check whether their findings are reliable and hunger affects concentration.
Credit any other relevant strengths.

QUESTION 5
Explain how demand characteristics might have occurred in this experiment. [2 marks]

2 marks for a clear and coherent explanation.
1 mark for a limited/muddled explanation.

CONTENT:
- It was a repeated measures design so participants took part in both conditions: before and after lunch.
- This would have made it fairly easy to guess the aim of the study and to have tried harder after lunch to please the experimenters.

QUESTION 6
The students thought that their method of measuring concentration had good face validity. Briefly explain what is meant by face validity in this context. [2 marks]

2 marks for a clear and coherent explanation of what is meant by the term face validity in this context.
1 mark for a limited/muddled explanation.
0 marks for a generic answer not linked to the stem.

CONTENT:
- Face validity refers to whether the method of measuring the DV in this experiment looks as though it measures what it claims to measure.
- The students must think that the time taken to find the errors in a passage of text, appear to measure concentration.
After they had completed their experiment, one of their friends pointed out that a problem with the experiment is that they did not use counterbalancing.

QUESTION 7
Explain why their friend thinks it would have been better to use counterbalancing in this experiment. [2 marks]

2 marks for a clear and coherent explanation of why their friend thinks it would have been better to use counterbalancing.
1 mark for a limited/muddled explanation.
0 marks for a generic answer not linked to the stem.
CONTENT:
- The students have used a repeated measures design which may have introduced order effects such as practice effects.
- The participants may have found the errors more quickly after lunch because it was the second time they had done the task and not because they had eaten their lunch.

QUESTION 8
Briefly explain why the psychology students could not carry out counterbalancing in this experiment if they wanted to test everyone on the same day. [2 marks]

2 marks for a clear and coherent explanation of why the psychology students could not carry out counterbalancing.
1 mark for a limited/muddled explanation.
CONTENT:
- Counterbalancing involves half the participants doing condition A followed by B (before lunch then after lunch), and half doing B followed by A (after lunch then before lunch).
- It would not be possible for students to first do the test after lunch and then do the test before lunch on the same day.

Another of their friends was concerned about the fact they used two different passages. They suggested that it might have been better to have used a matched pairs design instead of repeated measures.

QUESTION 9
Explain how a matched pairs design could have been used in this experiment. [3 marks]

Award 1 mark for each of the following points:
- Pairing the participants on a variable or variables that might affect their performance, such as concentration, grammatical ability, appetite, etc.
- Measurement of this variable and the pairing of the participants.
- Placing one participant from each pair in each condition (completing the task before and after lunch).
QUESTION 10
The students decided to use a related t-test to analyse the data they collected. Explain why they decided to use this test. [3 marks]

Award 1 mark for each of the following points:
♦ Students were looking for a difference in concentration before and after lunch.
♦ Students used a related design, as it is repeated measures.
♦ Collected interval level data, as the students measured the time taken in seconds to identify the errors.

QUESTION 11
After analysis of the data, the students obtained a calculated value of 1.809. For the related t-test, df = N – 1. Using the table below, explain whether or not the psychology students will be able to accept their hypothesis. Justify your answer. [3 marks]

1 mark for saying they will be able to accept their hypothesis.
Plus
1 mark for choosing the appropriate critical value of 1.729.
Plus
1 mark for explaining the calculated value is greater than the critical value at the 0.05 level.
0 marks for answers that state the hypothesis should be rejected, even if some/all of the other information is correct.

<table>
<thead>
<tr>
<th>ONE-TAILED TEST</th>
<th>0.05</th>
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<tbody>
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