PSYCHOLOGY
Sample Candidate Answers with Commentaries
Unit 1: Research Methods
July 2015
This resource offers examples of candidate answers for the Sample Assessment Materials and how they may be marked. There are separate resources for all AS and A Level components.

**Unit 1: Research Methods (H567/01)**

**Candidate Style Answers with Commentaries**

**Section A: Multiple choice (20 x 1 mark questions)**

**Question 1**

Which is the name of a type of interview?

A  closed  
B  likert  
C  quasi  
D  structured

**Answer** | **Commentary**
---|---
D  **Structured**  
All the other terms are related to research, but not a type of interview. A (closed) is a type of question that can be used in an interview, but is not in itself an interview technique. B (likert) is a rating scale, which again may be used in an interview. C (quasi) is a type of experiment.

**Question 2**

Look at the following academic reference:


What is the error in this Harvard style reference?

A  the date of the study should be at the end of the reference  
B  the page numbers are missing  
C  the surnames of the researchers should be listed in alphabetical order  
D  the title should give the aim of the investigation

**Answer** | **Commentary**
---|---
B  **The page numbers are missing**  
Everything else is cited correctly in the reference.
Question 3

Which two groups were compared in Chaney et al.'s (2004) study into operant conditioning?

A children being praised for using their inhaler and children being ignored when using their inhaler  
B children using a standard inhaler and children using a modified inhaler  
C children using an inhaler and children using no inhaler  
D children with asthma and children without asthma

**Answer**

**Commentary**

**B Children using a standard inhaler and children using a modified inhaler**  
All the other three options are factually incorrect.

---

Question 4

Look at the following data set from a condition where participants were timed (in seconds) completing a task in a crisis situation.

{36 45 51 67 54 19 50 45 27 76 54 45}

What is the range of this data set?

A 45  
B 47.5  
C 58  
D 76

**Answer**

**Commentary**

**C 58**  
76 - 19 +1 = 58  
The addition of +1 is a convention adopted by some to account for ‘measurement error’. Even without this measurement error correction, option C is the closest to the correct answer (i.e. even if the ‘measurement error correction’ was not implemented).
**Question 5**

Read the following hypothesis.

\[ H_1: \text{"Women who earn above average salaries will score significantly higher on a confidence test than women who earn below average salaries."} \]

What is the independent variable in this hypothesis?

- A earnings above or below average salaries
- B high or low average salary
- C high or low score on a confidence test
- D women or men

<table>
<thead>
<tr>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
</table>
| A *Earnings above or below average salaries* | B (high v low average salaries) is not the same as above or below average salaries.  
C is the DV.  
D is incorrect as there were no men in the study. |

**Question 6**

Which group of people were included as participants for Maguire’s (2000) study into the hippocampi of taxi-drivers?

- A females  
- B left-handed people  
- C people above 32 years of age  
- D people with health problems

<table>
<thead>
<tr>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>C <em>People above 32 years of age</em></td>
<td>All the other options are incorrect as they were not part of Maguire’s sample.</td>
</tr>
</tbody>
</table>

**Question 7**

What is meant by the term ‘socially desirable responses’ in psychological research?

- A responses which are personal even if they are subjective  
- B responses which are reliable even if they are invalid  
- C responses which reflect the participants' wishes even if they are unacceptable to others  
- D responses which the participants think they ought to give even if they are not true

<table>
<thead>
<tr>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>D <em>Response which the participants think they ought to give, even if they are not true</em></td>
<td>None of the other options relate to what the term ‘socially desirable responses’ refers to.</td>
</tr>
</tbody>
</table>
Question 8
Which is an example of qualitative data?

A. the diary entries of six patients suffering from schizophrenia
B. the length of time each participant spent reading a list of words
C. the modal colour chosen by extroverts
D. the percentage of respondents who agreed with capital punishment

**Answer**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. <em>The diary entries of six patients suffering from schizophrenia</em></td>
<td>Options B, C, and D are all numbers, so quantitative data, not qualitative. Diary entries would be qualitative as they are descriptive in their nature.</td>
</tr>
</tbody>
</table>

Question 9
What is the probability of a significant result occurring by chance where the significance level is $p \leq 0.025$?

A. 2.5% or less
B. 25% or less
C. at least 97.5%
D. less than 2.5%

**Answer**

<table>
<thead>
<tr>
<th>Answer</th>
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</tr>
</thead>
<tbody>
<tr>
<td>A. 2.5% or less</td>
<td>The answer has to be equal to something or less than something, and the only other option worded like this is B, but that states 25% (which would be expressed as 0.25 as a decimal).</td>
</tr>
</tbody>
</table>

Question 10
Which inferential test should a researcher use to decide whether a correlation is significant?

A. Binomial Sign test
B. Mann–Whitney U test
C. Spearman’s Rho test
D. Wilcoxon Signed Ranks test

**Answer**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. <em>Spearman’s Rho test</em></td>
<td>Options A, B, and D are tests that assess differences, not correlations. Therefore, Spearman’s Rho is the only possible correct answer.</td>
</tr>
</tbody>
</table>
Question 11
Which one of the following is a feature of all experiments?

A direct manipulation of the independent variable  
B measurement of a dependent variable  
C random allocation of participants to conditions  
D use of controlled environment

Answer | Commentary
--- | ---
B Measurement of a dependent variable | A (direct manipulation of an independent variable) is not correct, as this does not happen in quasi experiments.  
C is not correct, as random allocation of participants to conditions does not always occur.  
D is not correct as only laboratory experiments are conducted in controlled environments (e.g. field experiments are not).

Question 12
How was one of the dependent variables measured in Grant et al’s (1998) study into context-dependent memory?

A the amount of time taken to recall ten key details from a written passage  
B the number of details recalled from a commentary played through headphones  
C the number of written words recognised from a commentary played through headphones  
D the score from multiple-choice questions based on a written passage

Answer | Commentary
--- | ---
D The score from multiple choice questions based on a written passage | All the other options are incorrect.

Question 13
Look at the following scatter diagram:

Which is the best estimate of the correlation coefficient for the data?

A 0.7  
B 0.4  
C 0.3  
D 0.8

Answer | Commentary
--- | ---
C 0.3 | All the options are positive correlations, but the arrangement of data indicates a weak positive correlation, and 0.3 (option C) is the weakest.
Question 14

What is a weakness of using a mode as a measure of central tendency?

A. It can generate a number not in the data set
B. It is easily affected by outliers
C. It is not suitable for nominal data
D. It relies on a score occurring more than once

Answer | Commentary
---|---
D. It relies on a score occurring more than once | All other options are incorrect.

Question 15

Which is a requirement of a parametric test?

A. Data is at least ordinal level
B. Mean scores are significantly different
C. Sample is drawn from a skewed population
D. Standard deviations are not significantly different

Answer | Commentary
---|---
D. Standard deviations are not significantly different | A is incorrect as some parametric tests can work with nominal or ordinal data. B is incorrect as there is no requirement that the mean scores are significantly different (this is what is actually being assessed by / is the purpose of the test). C the sample should NOT be drawn from a skewed population.

Question 16

In Bandura’s (1961) Bobo doll study, the participants were pre-tested to assess their aggression levels. What was the main purpose of his procedure?

A. To allow for a matched pairs design
B. To exclude children who were especially aggressive
C. To help to decide on the sex of the role model for each participant
D. To measure the change in aggression before and after the experiment

Answer | Commentary
---|---
A. To allow for a matched pairs design | Options B and C are clearly not true. Option A is the best match here.
**Question 17**

Which feature of science refers to the importance of being able to refute a psychologist’s claim?

A deduction  
B face validity  
C falsification  
D verification

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>C Falsification</td>
<td>The definition relates to falsification. A (deduction) is the process of reaching a certain conclusion. B (face validity) is whether a test/measure at least appears to be able to do what it claims. D (verification) is concerned with confirming things.</td>
</tr>
</tbody>
</table>

**Question 18**

Which is an example of interval level data?

A the mass, in grams, of the brain of an individual with schizophrenia  
B the number of nightmares experienced by an individual with schizophrenia  
C the number of times an individual with schizophrenia has been admitted to hospital  
D the rating of the severity of the delusions experienced by an individual with schizophrenia

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>A The mass, in grams, of the brain of an individual with schizophrenia</td>
<td>Option A is the only one that uses a standard, universal scale of measurement that is on a fixed scale i.e. grams and would therefore be interval data.</td>
</tr>
</tbody>
</table>

**Question 19**

What was Milgram (1963) unable to control in his experiment into obedience?

A how Mr Wallace interacted with the participant  
B the comments used as prods  
C the confederate acting as the experimenter  
D the increments in voltage

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>A How Mr Wallace interacted with the participant</td>
<td>This is because it was not possible to anticipate all the many and varied ways that the participant may behave (e.g. in the initial encounter when they were first introduced to each other. Similarly, afterwards in the debrief session). All of the other options were controlled.</td>
</tr>
</tbody>
</table>
### Question 20

What is meant by induction in psychological research?

- **A** where a theory is tested through observations
- **B** where observations contradict a theory
- **C** where observations generate a definitive theory
- **D** where observations generate a likely theory

**Answer**

<table>
<thead>
<tr>
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<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong> Where observations generate a likely theory</td>
<td>All other options are incorrect.</td>
</tr>
</tbody>
</table>
A psychologist used an observation to investigate the effect of environment on individuals' need for personal space. They decided to carry out a covert observation in three settings: a nightclub, a college library and the changing room in a leisure centre. Members of the public using the facilities made up the sample. The psychologist observed key behaviours, such as reduced eye contact, defensive body posture and movement away from people.

### 21. Outline one strength of using an observation compared to a self-report. [2]

<table>
<thead>
<tr>
<th>Band</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>A researcher can see for themselves what people do in a situation, 'it has higher validity.'</td>
<td>This response does not outline why the strength presented is a good thing.</td>
</tr>
<tr>
<td>High</td>
<td>A researcher can see for themselves what people do in a situation, rather than having to rely upon on the honesty of what someone says if using a self-report, so it has higher validity.</td>
<td>Here the candidate has elaborated on why the strength presented is a good thing. The comparison with a self-report is explicit.</td>
</tr>
</tbody>
</table>

### 22. Outline three ethical issues that would need to be considered when carrying out this observation. [3]

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Lack of consent, invasion of privacy and withdrawal.</td>
<td>Here the candidate has simply named three ethical issues.</td>
</tr>
<tr>
<td>High</td>
<td>Lack of consent, as the people (in the night club/library/changing room are not aware they are being studied. Also, invasion of privacy, especially when undressing in the changing room. Finally, withdrawal as people in the night club/library/changing room can not refuse to have data about them used as they are unaware a study is taking place.</td>
<td>This response elaborates on how/why the ethical issues cited are relevant, and is in context.</td>
</tr>
</tbody>
</table>
23. The psychologists used an opportunity sample for their research.  
(a) Explain one strength and one weakness of using an opportunity sample for this study. [6]

<table>
<thead>
<tr>
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</tr>
</thead>
</table>
| Low  | One strength is that participants are easy to obtain for the study.  
One weakness is that you can’t generalize your findings. | Here the candidate simply states a strength and a weakness and does not explain why they are strengths/weaknesses. The answer is also not in context. |
| High | One strength is that participants are easy to obtain for the study as they are simply people who are around and available at the time in the night club, library and changing room, so the researcher just takes advantage of who is there at the time.  
One weakness is that you can’t generalise your findings, because the sample may be biased in some way and not representative. For example, only one particular night club, library and changing room were used. Therefore, it might not be the environment that influences personal space, but the type of people present when the study was conducted (some people might simply need more personal space than others, regardless of the environment they are in). | This response elaborates on the strength and weakness by providing examples in context of the theme of what the research was about. |

(b) Name and outline one other sampling technique for selecting participants. [2]

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Self-selected sampling</td>
<td>Here the candidate has just named another sampling technique.</td>
</tr>
<tr>
<td>High</td>
<td>Self-selected sampling could be used by putting up a poster in the entrance of the night club/library/changing room asking for volunteers for a study investigating the influence of environment on personal space.</td>
<td>This response both names and outlines how another sampling technique could be used. The wording of the question does not demand the answer is in context, but this does help with the elaboration and outline of how the sampling method will be used.</td>
</tr>
</tbody>
</table>

(c) Describe one strength and one weakness of the sampling technique you have chosen in question 23(b). [4]

<table>
<thead>
<tr>
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</tr>
</thead>
</table>
| Low  | A strength of self-selected sampling is that informed consent is obtained.  
A weakness of self-selected sampling is that the sample could be biased. | The candidate here simply identifies a strength and weakness. |
| High | A strength of self-selected sampling is that informed consent is obtained because people freely choose to take part in the research themselves.  
A weakness of self-selected sampling is that the sample could be biased because only a certain type of person may choose to take part, which means the data obtained will not be representative of a wider group of people. | This response applies the strength and weakness to the sampling technique, justifying why it is a strength/weakness. |
You have been asked to carry out a further observational study to investigate the differences in use of personal space between rural and urban environments. This will be part of a quasi experiment using one village and one city.

### 24. Write an alternative hypothesis for your investigation. [3]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>There will be a significant difference in the distance between urban dwellers and city dwellers.</td>
<td>This hypothesis states that there will be a difference so is an alternative hypothesis, and it refers to both the IV and DV. However, it lacks operational detail.</td>
</tr>
<tr>
<td>High</td>
<td>There will be a significant difference in the distance (measured in metres) between urban dwellers (people living in rural locations) and city dwellers when stood talking to each other.</td>
<td>This is a correctly stated alternative hypothesis with operational details of the variables studied.</td>
</tr>
</tbody>
</table>

### 25. Explain how you would carry out an observation to investigate the differences in the use of personal space between rural and urban environments. Justify your decisions as part of your explanation. You must refer to:
- structured or unstructured observations
- participant or non-participant observations
- time or event sampling
- collection of data

You should use your own experience of carrying out an observation to inform your response. [15]

<table>
<thead>
<tr>
<th>Band</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>The study will take place on a midweek day with two observers used (one for each location). Each observer will stand in a position where they have a good view of members of the public, but make their observations covertly so they are not seen by people. Time sampling will be used with behaviours being monitored at different times throughout the whole day. The data will be recorded using a pre-prepared chart in the same way by each observer. Conducting the study in this way is good because different times of day are monitored so it is more representative of peoples' behaviour. The covert recording of behaviour will increase the validity of the data collected as people will not then show demand characteristics. Having two different observers increases the inter-rater reliability also.</td>
<td>Here only one of the required features (time sampling) of the study is referred to (and this is not explicit). Moreover, there is a lack of detail throughout that would make replication very difficult. The attempted evaluation and justification is brief and not in context at any time. There are also inaccuracies and errors showing a lack of understating of the observational method (e.g. simply having two observers does not in itself automatically increase inter-rater reliability). There is no reference to their own experience of carrying out an observation.</td>
</tr>
</tbody>
</table>
The study would be conducted on a Wednesday in summer (middle of July), in two different locations: Manchester city centre and the village of Lymm in Cheshire. There would be two different researchers, with one for the city location and one for the village.

A structured observation would be conducted using the predetermined behavioural categories in the recording table below.

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Avoids eye-contact</th>
<th>Stood more than ½ metre apart</th>
<th>Stood less than ½ metre apart</th>
<th>Moves closer</th>
<th>Moves farther away</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City centre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This would allow easy recording of personal space behaviours with a simple tally created of the number of times each behaviour occurred in both urban and city areas. It would also increase the reliability of the data collection process by using the same behavioural checklist in both urban and city areas. The advantage of efficient recording of data that the use of a structured observation allows was evident when using this technique to study students’ use of mobile phones in college. It also increased inter-rater reliability by standardizing the types of mobile phone behaviour for each different observer to look out for.

This would be a non-participant observation, with the researcher covertly recording peoples’ behaviour whilst sat on a bench pretending to read a newspaper. This would allow data to be recorded unobtrusively, although it may be difficult at times to be certain about what personal space behaviours are engaged in if sat too far away or if passers-by obstruct the researchers view. This was evident in my own study of students use of mobile phones where my view of students was sometimes obscured by people standing in front of me.

Time sampling would be used with observations occurring every half-hour, for two minutes each time between 8am and 6pm. This would allow a more representative collection of data of peoples’ personal space behaviour covering many different parts of the day. For example, it may show that personal space is influenced by factors such as whether people are in a rush to get to work in the morning, and this may be different for urban dwellers compared to city workers etc. This should increase the overall validity of the data by not just focusing on one particular time period. However, by only recording behaviour each half hour, there may be lots of examples of personal space behaviours that do not get recorded.

This was the technique I used in my own observation of students use of mobile phone usage in college and allowed for a greater representation of how different types of students use their phone at different times of the day.

Location, location, location... The opening paragraph makes it clear where and when the study will take place.

Here the candidate clearly outlines the use of a structured observation, with explicit details of the behavioural categories to be used. This makes it very clear how the data will be collected and recorded.

There is a clear rationale presented for the use of the structured observation technique with strengths and weaknesses discussed in context.

Here the candidate makes explicit reference to their own practical work to justify the advantages of using a structured observation.

Here the candidate clearly outlines the use of the non-participant observation technique, with explicit details of how this will be implemented. There is also an evaluation of this in context. The candidate also clearly uses their own experiences of conducting research using non-participant observation to illustrate potential problems.

Here the candidate clearly outlines the use of a time sampling, with explicit details of exactly when and how data will be recorded. This is then evaluated with strengths and weaknesses in context.

Here the candidate makes explicit reference to their own experiences of using time sampling.
Section C: Data analysis and interpretation

A psychologist tested the effects of expectations on people’s perceptions by carrying out the following experiment. The test item was an ambiguous image – an image that had been purposefully drawn to be perceived in one of two ways – either as a monkey or as a teapot. Participants had to say what they saw after they had viewed the image for one second.

Before carrying out the experiment, the psychologist had checked that the ambiguous image could be perceived in one of two ways. His findings, from this check, are presented in the bar chart below:

![Bar chart showing frequency of different perceptions](attachment:image.png)

### 26(a) Identify two findings from the bar chart. [2]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>The ambiguous image was mainly perceived as a teapot, or as a monkey.</td>
<td>This is only really one finding.</td>
</tr>
<tr>
<td>High</td>
<td>The ambiguous image was perceived as a teapot just as many times (9) as it was perceived as a monkey (also with a frequency count of 9). Another finding is that there were only two other reports of perceiving the ambiguous image as anything other than a teapot or a monkey.</td>
<td>Here we have two distinct and clearly presented findings from the data presented in the bar chart.</td>
</tr>
</tbody>
</table>

### (b) Explain why a bar chart is appropriate for presenting this data. [2]

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Because the data in this study is nominal.</td>
<td>Here there is no justification of how/why the data is nominal.</td>
</tr>
<tr>
<td>High</td>
<td>A bar chart is appropriate for displaying nominal data and the data obtained is simply the number of times the ambiguous image was perceived as a teapot, a monkey or anything else. It also allows an easy visual comparison of the number of times the ambiguous image was perceived as a teapot or monkey so that if there was a difference this could be spotted quickly.</td>
<td>This is a clearly stated response explained using examples in context.</td>
</tr>
</tbody>
</table>
(c) Calculate the percentage number of times that the image was identified as neither a monkey nor a teapot. Show your workings. [2]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10%</td>
<td>No workings out shown.</td>
</tr>
<tr>
<td>High</td>
<td>10%</td>
<td>Correct answer with workings out clearly shown.</td>
</tr>
</tbody>
</table>

\[
\frac{2 \times 100}{20} = 10
\]

Fifty participants were recruited and then randomly allocated into two groups. In one condition, five drawings of other animals were presented, one after the other, before the ambiguous image. Participants had to name each one of these. In the second condition, the set up was the same but five images of kitchen items were used.

27(a) Name and briefly describe the experimental design used in this study. [2]

<table>
<thead>
<tr>
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<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Independent measures design.</td>
<td>This is only really one finding.</td>
</tr>
<tr>
<td>High</td>
<td>The ambiguous image was perceived as a teapot just as many times (9) as it was perceived as a monkey (also with a frequency count of 9). Another finding is that there were only two other reports of perceiving the ambiguous image as anything other than a teapot or a monkey.</td>
<td>Here it is named and described (in context).</td>
</tr>
</tbody>
</table>

(b) Explain how the psychologist would have randomly allocated participants to each group. [2]

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>All the names would have been put into a hat and selected.</td>
<td>Lacks clarity. Unclear whose names are referred to, and how individuals end up in either condition.</td>
</tr>
<tr>
<td>High</td>
<td>Names of all the fifty participants would have been put into a hat, then the first 25 to be picked would be assigned to one condition (exposed to pictures of animals) and the remaining 25 assigned to the other condition (exposed to pictures of kitchen items).</td>
<td>Clearly explained process for randomly allocating participants.</td>
</tr>
</tbody>
</table>

(c) Explain why this experimental design was appropriate for this study. [5]

<table>
<thead>
<tr>
<th>Band</th>
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<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>To reduce demand characteristics and order effects from occurring.</td>
<td>Just two reasons for using independent measures design are presented, and neither are supported with examples (whether in context or not).</td>
</tr>
<tr>
<td>High</td>
<td>Using independent measures design reduces demand characteristics – e.g. participants becoming aware of the aims of the study and reporting seeing a teapot, when really they saw a monkey etc. It also reduces any practice effects that might be gained, such as reporting the image as a teapot just because this is how they first perceived it. Finally, it reduces the need to have a time interval in between the two conditions.</td>
<td>Here the candidate presents three different reasons to explain why the independent measures design was used and supports two of them with examples in context.</td>
</tr>
</tbody>
</table>
A table to show the number of participants who perceived the ambiguous image as a monkey or as a teapot from both conditions: image presented with animals and image presented with kitchen items.

<table>
<thead>
<tr>
<th></th>
<th>Perceived as monkey</th>
<th>Perceived as teapot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presented with animals</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Presented with kitchen items</td>
<td>5</td>
<td>12</td>
</tr>
</tbody>
</table>

28(a) Identify and simplify the ratio of the number of participants who perceived a monkey in the first condition and the number who perceived a monkey in the second condition. [2]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>The ratio is 15 to 5</td>
<td>Here only the number of participants perceiving the image as a monkey in the first condition compared to the second condition has been presented.</td>
</tr>
<tr>
<td>High</td>
<td>The ratio is 15 to 5 (15:5). This can be simplified to 3 to 1 (3:1)</td>
<td>Here the number has been presented and simplified.</td>
</tr>
</tbody>
</table>

(b) Identify and simplify the ratio of the number of participants who perceived a teapot in the first condition and the number who perceived a teapot in the second condition. [2]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>The ratio is 10 to 12.</td>
<td>Here only the number of participants perceiving the image as a teapot in the first condition compared to the second condition has been presented.</td>
</tr>
<tr>
<td>High</td>
<td>The ratio is 10 to 12 (10:12). This can be simplified to 5 to 6 (5:6)</td>
<td>Here the number has been presented and simplified in standard format.</td>
</tr>
</tbody>
</table>

29. The psychologist analysed the data using the chi-square test. Give two reasons for this choice of test with reference to the study. [4]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Because the data was nominal and a difference was predicted.</td>
<td>Two appropriate reasons are stated here, but with no explanation.</td>
</tr>
<tr>
<td>High</td>
<td>One reason is that the data collected was nominal (simply the number of times the image was perceived as a teapot or a monkey). Another reason is that Chi Square tests for differences, and the study was to investigate if there was a difference in how the image was perceived depending on the type of pictures shown to the participants first (animals or kitchen items).</td>
<td>Here two appropriate reasons are presented and explained in context.</td>
</tr>
</tbody>
</table>
30. Explain how the psychologist would determine the appropriate degrees of freedom (df) for this test. [2]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>The number of rows and columns would be used.</td>
<td>Here it is very unclear how the number of rows and columns would be used.</td>
</tr>
</tbody>
</table>
| High  | The number of rows and columns that the data is presented in would be used and 1 subtracted from each before multiplying them together.  

\[
(rows - 1) \times (columns - 1) 
\]

\[
= (2-1) \times (2-1) 
\]

\[
= 1 
\]

Therefore df=1  

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
</table>
| High  | The number of rows and columns that the data is presented in would be used and 1 subtracted from each before multiplying them together.  

\[
(rows - 1) \times (columns - 1) 
\]

\[
= (2-1) \times (2-1) 
\]

\[
= 1 
\]

Therefore df=1  

The Chi Squared gave an observed (calculated) value of 3.80

Levels of significance for a one–tailed test

<table>
<thead>
<tr>
<th>Significance Level</th>
<th>0.05</th>
<th>0.025</th>
<th>0.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Value</td>
<td>2.71</td>
<td>3.84</td>
<td>5.41</td>
</tr>
</tbody>
</table>

31. Using the above critical values, explain whether the psychologist has found a significant difference or not. [4]

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Yes, because the calculated value is greater than the critical value.</td>
<td>This response lacks detail as it does not indicate at which level of probability the results are significant.</td>
</tr>
<tr>
<td>High</td>
<td>There is a significant difference in the perception of the image as a teapot or a monkey. This is because the calculated value of X² (3.80) is greater than the table critical value (2.71) at the 5% (0.05) level of probability. However, the results are not significant at the other, more stringent levels as the calculated value is not greater than the critical values at these probability levels.</td>
<td>This response is in detail and provides reasons why the results are significant.</td>
</tr>
</tbody>
</table>
32 Outline what is meant by each of the following features of science and state how they apply to this experiment into perception.

(a) cause-and-effect \([3]\)  

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Cause-and-effect is the study of whether one thing effects or influences something else. In this study it was to see if pictures effected the perception of an image.</td>
<td>This is a brief and unclear response, although there is some attempt to apply it to the study.</td>
</tr>
<tr>
<td>High</td>
<td>Cause-and-effect is investigated using experimental methods whereby one variable (IV) is predicted to have an effect on another (DV). In a controlled setting it is possible to establish the extent to which something is the direct cause of something else. In this study it was possible to tell if the type of images previously shown to participants (IV = pictures of animals or kitchen items) effected their perception of the ambiguous one (DV = whether it was reported as a teapot or a monkey).</td>
<td>This is a clear and detailed response that uses appropriate terms (IV and DV) and discussed in context.</td>
</tr>
</tbody>
</table>

(b) Objectivity \([3]\)  

<table>
<thead>
<tr>
<th>Band</th>
<th>Answer</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Objectivity is whether something is true and accurate. Quantitative data is usually objective as it measures things accurately.</td>
<td>This is a brief and unclear response that is not applied to the study. The statement about quantitative data is also not necessarily (or always) true.</td>
</tr>
<tr>
<td>High</td>
<td>Objectivity refers to the extent to which something is factual or not. If something is objective it is clear and undisputable, whereas subjectivity is where there is a lack of certainty and differences of opinion. In this study it was clear whether the participants reported the image as a teapot or a monkey (one thing or the other), so the data was objective.</td>
<td>This is a clear and detailed response that is applied to the study in context.</td>
</tr>
</tbody>
</table>
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