Psychology 2019 v1.4

IA1: Sample assessment instrument

Data test (10%)

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

Student name

Student number

Teacher

Exam date

Marking summary

Criterion	Marks allocated	Provisional marks
Data test	10	
Overall		

Queensland Government
Queensland Curriculum & Assessment Authority
220964

Conditions

Technique	Data test — short response
Unit	Unit 3: Individual thinking
Topic/s	Topic 2: Visual perception Topic 3: Memory
Time	60 minutes + 10 minutes perusal
Seen/Unseen	Unseen questions and datasets
Other	QCAA-approved graphics calculator permitted

Instructions

Use the datasets to respond to the associated questions in the spaces provided. Each question is associated with the dataset that immediately precedes it.

Data test summary

Dataset	Question	Objective			
		Apply understanding	Analyse evidence	Interpret evidence	
1	1	1			
	2	1			
	3	2			
	4		1		
	5		1		
	6			1	
2	7	2			
	8		1		
	9		1		
	10			1	
	11		2		
	12			1	
3	13			1	
	14			1	
	15			2	
	16			1	
Total		**6**	**6**	**8**	**20**
Percentage		**30%**	**30%**	**40%**	**100%**

Dataset 1

Scientists conducted a study in order to test whether past knowledge or experience plays a part in how humans perceive objects. They hypothesised that there is a relationship between age and perceiving faces in ambiguous pictures. Researchers used ambiguous pictures of figures similar to the 'rat-man' image in the study by Bugelski and Alampay (1961).

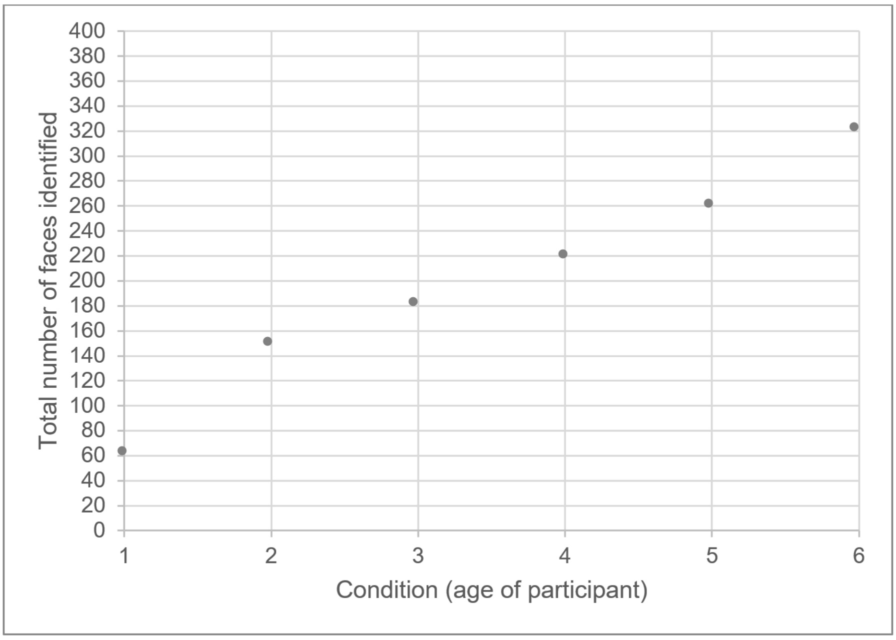
Design

- Independent groups design.
- Participants were allocated to conditions based on age
  - condition 1 — 18 to 25
  - condition 2 — 26 to 35
  - condition 3 — 36 to 45
  - condition 4 — 46 to 55
  - condition 5 — 56 to 65
  - condition 6 — above 66.
- Sample size: 10 participants per condition.

Methodology

- Participants were presented with a series of 40 ambiguous pictures and were asked to identify what they saw.
- The number of times participants identified the ambiguous picture as a human face was recorded.

Figure 1: The relationship between age and the total number of faces identified from ambiguous figures for each age group



Researchers used Pearson's correlation coefficient to analyse the data. They compared the relationship observed in this experiment with the relationship observed in previous research. The results are reported in Table 1.

Table 1: Pearson's correlation coefficient for current and previous research

	Current research	Previous research
Pearson's correlation coefficient	r=0.98	r = 0.70

Question 1 (1 mark)

Determine the total number of faces identified by participants in condition 5.

Answer: faces

Question 2 (1 mark)

Determine the total number of faces identified by participants aged 26 to 35 years.

Answer: faces

Question 3 (2 marks)

Calculate the median number of faces for the dataset. Show your working.

Answer: faces

Question 4 (1 mark) **Up to 50 word response**

Identify, with reference to Figure 1, the relationship between age and the identification of faces in the ambiguous pictures.

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Question 5 (1 mark)	Up to 50 word response

Contrast, with reference to Table 1, Pearson's correlation coefficient (r) for the current research with that for the previous research.

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Question 6 (1 mark)	Up to 50 word response

Draw a conclusion, with reference to Table 1, about the relationship between age and the identification of faces in ambiguous pictures.

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Dataset 2

A class modified the experiment by Grant et al. (1998) in order to determine if context affects memory for newly learnt information.

Null hypothesis: There will be no difference in learning, as measured by recall, between participants in the matching and mismatching conditions.

Alternative hypothesis: Participants in the matching condition will learn more material, as measured by recall, than those in the mismatching condition.

Design

- Independent groups design.
- Sample size: 10 participants.

Methodology

- Participants were given new study material to learn in either a noisy or quiet environment.
- Those in the matching condition studied in a noisy environment and completed a short-answer test of the newly learnt material also in a noisy environment.
- Those in the mismatching condition studied in a noisy environment, but then completed a short-answer test of the newly learnt material in a quiet environment.
- A Mann–Whitney U test was used to analyse the data.

Table 2: Raw data for the matching and mismatching conditions

Matching	Mismatching
6	4
7	5
8	4
7	3
6	5
5	5
5	4
6	4
8	3
8	5

Table 3: Standard deviation scores and *p* value for the matching and mismatching conditions

	Standard deviation (s)	*p* value (p)
Matching	1.17	0.01
Mismatching	0.79	

Question 7 (2 marks)

Calculate the mean for the mismatching condition.

Use th5e formula $\bar{x} = \frac{x_1+x_2+\cdots+x_N}{N}$ where x = raw data point and N = sample size.

Round your answer to the nearest whole number.

$\bar{x}\ mismatching =$

(whole number)

Question 8 (1 mark) **Up to 50 word response**

Identify one characteristic of the data in Table 2 that makes it appropriate to use the mean as a measure of its central tendency.

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Question 9 (1 mark) **Up to 50 word response**

Distinguish between the standard deviation (s) scores in Table 3.

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Question 10 (1 mark)	Up to 50 word response

Deduce which condition had the greatest variability in its data.

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Question 11 (2 marks)	Up to 50 word response

Identify two characteristics of the data that make it appropriate to use the Mann-Whitney U statistical test to analyse this data.

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Question 12 (1 mark)	Up to 50 word response

Infer what the results of the statistical test show.

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Dataset 3

Researchers wanted to modify Experiment II from the series of experiments conducted by Craik and Tulving (1975) to investigate depth of processing.

Research question: Does depth of processing increase response latency?

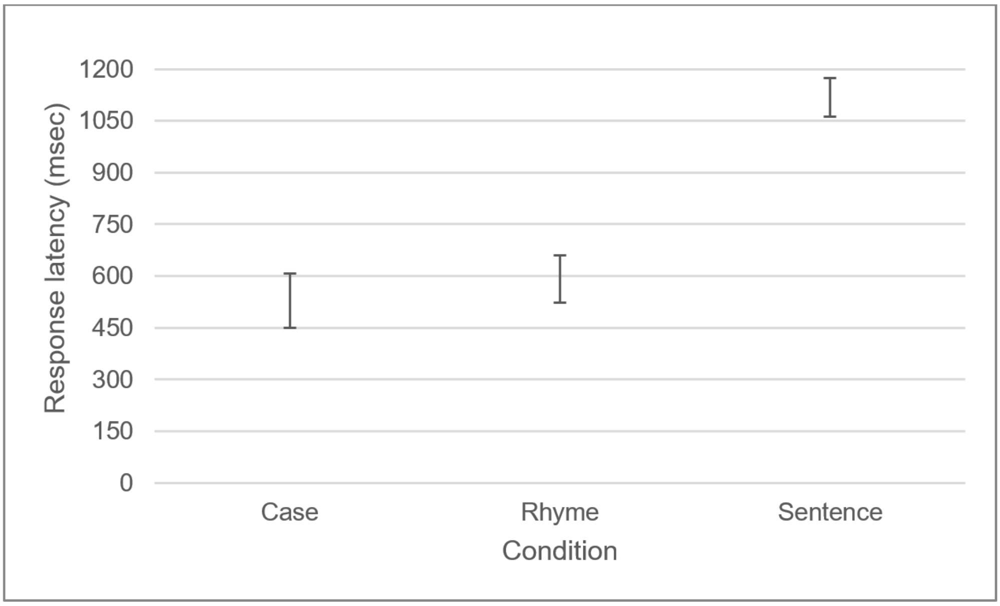
Design

- Independent groups design.
- Sample size: 10 participants per condition.

Methodology

- Participants were presented with words for 200 milliseconds. Before the word was exposed, participants were asked a question about the word.
- The three types of questions were used to induce the participant to process the word at relatively shallow levels through to relatively deep levels.
- The three conditions of the experiment were
  - case questions (i.e. upper case or lower case)
  - rhyme questions (e.g. does the word rhyme with weight?)
  - sentence questions (e.g. would the word fit the sentence ‘He met a _______ in the street?’).
- The time taken for participants to record a response to the questions was measured.

Figure 2: Confidence intervals for Case, Rhyme and Sentence conditions



Question 13 (1 mark)	Up to 50 word response

Draw a conclusion about the confidence interval for one condition in Figure 2.

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Question 14 (1 mark)	Up to 50 word response

Deduce whether the result for the Case condition is statistically different to the result for the Sentence condition.

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Question 15 (2 marks)	Up to 50 word response

Draw a conclusion about the confidence intervals for the Case and Rhyme conditions. Give a reason or the conclusion.

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Question 16 (1 mark)	**Up to 50 word response**

Draw a conclusion, with reference to Figure 2, about the depth of processing in the Sentence condition.

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END OF PAPER

References

Bugelski, B R & Alampay, DA 1961, ‘The role of frequency in developing perceptual sets’, *Canadian Journal of Psychology*, vol.15, no. 4, pp. 205–211, https://doi.org/10.1037/h0083443.

Craik FIM & Tulving, E 1975, ‘Depth of processing and the retention of words in episodic memory’, *Journal of Experimental Psychology: General*, vol. 104, no. 3, pp. 268–294, https://doi.org/10.1037/0096-3445.104.3.268.

Grant, HM, Bredahl, LC, Clay, J, Ferrie, J, Groves, JE, McDorman, TA & Dark, VJ 1998, ‘Context-dependent memory for meaningful material: Information for students’, *Applied Cognitive Psychology*, vol. 12, no. 6, pp. 617–623, https://doi.org/10.1002/(SICI)1099-0720(1998120)12:6<617::AID-ACP542>3.0.CO;2-5.

Instrument-specific marking guide (IA1): Data test (10%)

Criterion: Data test

Assessment objectives

2. apply understanding of localisation of function in the brain, visual perception, memory, or learning to given algebraic, visual or graphical representations of scientific relationships and data to determine unknown scientific quantities or features
3. analyse evidence about localisation of function in the brain, visual perception, memory, or learning to identify trends, patterns, relationships, limitations or uncertainty in datasets
4. interpret evidence about localisation of function in the brain, visual perception, memory, or learning to draw conclusions based on analysis of datasets

The student work has the following characteristics:	Cut-off	Marks
• consistent demonstration, across a range of scenarios about localisation of function in the brain, visual perception, memory, or learning, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual and graphical representations of scientific relationships and data – correct and appropriate use of analytical techniques to correctly identify trends, patterns, relationships, limitations and uncertainty – correct interpretation of evidence to draw valid conclusions.	> 90%	10
	> 80%	9
• consistent demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual and graphical representations of scientific relationships and data – correct use of analytical techniques to correctly identify trends, patterns, relationships, limitations and uncertainty – correct interpretation of evidence to draw valid conclusions.	> 70%	8
	> 60%	7
• adequate demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual and graphical representations of scientific relationships and data – correct use of analytical techniques to correctly identify trends, patterns, relationships, limitations and uncertainty – correct interpretation of evidence to draw valid conclusions.	> 50%	6
	> 40%	5

The student work has the following characteristics:	Cut-off	Marks
• demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of elements, of – selection and correct application of scientific concepts, theories, models and systems to predict outcomes, behaviours and implications – correct calculation of quantities through the use of algebraic, visual or graphical representations of scientific relationships or data – correct use of analytical techniques to correctly identify trends, patterns, relationships, limitations or uncertainty – correct interpretation of evidence to draw valid conclusions.	> 30%	4
	> 20%	3
• demonstration, in scenarios about localisation of function in the brain, visual perception, memory, or learning, of elements of – application of scientific concepts, theories, models or systems to predict outcomes, behaviours or implications – calculation of quantities through the use of algebraic or graphical representations of scientific relationships and data – use of analytical techniques to identify trends, patterns, relationships, limitations or uncertainty – interpretation of evidence to draw conclusions.	> 10%	2
	> 1%	1
• does not satisfy any of the descriptors above.	≤ 1%	0