2011 Psychology GA 1: Written examination 1

GENERAL COMMENTS

The 2011 Psychology 1 examination was the first examination based on the revised *VCE Psychology Study Design*. The exam contained an extended response question (Section C), and Section A and Section B were no longer divided into separate Areas of Study.

SPECIFIC INFORMATION

Note: Student responses reproduced herein have not been corrected for grammar, spelling or factual information.

For each question, an outline answer (or answers) is provided. In some cases the answer given is not the only answer that could have been awarded marks.

Section A – Multiple-choice questions

The table below indicates the percentage of students who chose each option. The correct answer is indicated by shading.

Question	% A	% B	% C	% D	Comments
1	89	3	6	2	
2	1	5	88	7	
3	70	1	25	4	Paulette would be most unlikely to show beta-waves in a meditative state. The meditative state is sometimes referred to as the 'alpha state'.
4	1	4	9	86	
5	5	11	80	4	
6	95	1	2	2	
7	15	25	10	50	Options A, B and C can be discounted as infants typically spend approximately 50 per cent of sleep time in REM sleep.
8	17	29	49	5	It is true that the adolescent sleep/wake cycle has shifted forward due to their age (option B), but this does not explain why the sleeper in Graph 1 spends more time in REM sleep than the sleeper in Graph 2.
9	2	6	86	6	
10	23	2	7	68	The restorative theory proposes that physical recuperation requires extended periods of slow-wave sleep (stages 3 and 4).
11	65	4	28	3	Each sleep cycle lasts about 90 to 100 minutes, therefore after two hours a sleeper would typically be well into the second cycle and in deep sleep.

Question	% A	% B	% C	% D	Comments
12	43	8	32	16	Studies of prolonged sleep deprivation involve a range of data collection processes and self-report (option A) is unlikely to be a significant method used. Convenience sampling is commonly used, and this means that the sample is highly selected.
13	6	5	3	86	
14	5	11	79	5	
15	1	6	86	7	
16	5	14	10	72	
17	5	18	58	20	Sleep is an altered state of consciousness, not an absence of consciousness. When dreaming, the contents of consciousness may be more extensive than in normal waking consciousness.
18	3	63	27	6	The PET scan would show the area that was damaged, but the MRI would be much more clear and detailed.
19	14	76	9	2	
20	0	1	58	41	Debriefing (option D) occurs **after** the research is complete.
21	77	8	7	7	
22	45	12	21	21	A SPECT scan shows the structure and function of the brain in a three-dimensional image using a radioactive tracer.
23	60	12	10	18	Motion after-effect is not dysfunctional.
24	1	7	84	7	
25	4	6	4	85	
26	25	11	59	4	Consolidation refers to the formation of long-term memories.
27	40	28	21	11	The amygdala is involved in the formation of implicit and procedural memories.
28	3	2	2	93	
29	6	4	22	67	Damage to the hippocampus is unlikely to affect procedural memories. Spatial memories may be affected.
30	3	76	18	2	Craik and Lockhart's terminology refers to structural, phonemic and semantic encoding.
31	1	82	11	5	
32	18	4	10	67	Research has shown that for healthy elderly adults, performance on recognition tasks does not decline.
33	80	0	6	14	
34	2	8	87	2	
35	0	1	88	10	This question was about levels of processing. Option D was correct as Lisa had used a semantic encoding strategy.
36	1	21	15	62	Students did not consider all aspects of this question.
37	11	47	31	11	Free recall (option C) is the **least** sensitive measure of retention.
38	1	2	1	96	
39	93	2	1	4	
40	1	3	3	92	
41	7	13	10	71	
42	71	3	24	1	
43	84	4	3	9	
44	16	80	3	1	
45	38	33	14	15	This question assessed students' knowledge and understanding of reliability estimates of a psychometric instrument. Split-half reliability was represented by option D. Option A referred to validity. Option B referred to test-retest reliability, which is not related to internal consistency.

Section B – Short answer questions

Some students neglected to address the specific instructions in some questions. This occurred most frequently in Questions 2b., 4, 6b. and 8c. Students also struggled to relate their answers to the specific scenarios described; for example, the research designs described in Questions 6 and 8.

Question 1

Marks	0	1	2	3	4	Average
%	28	21	16	19	15	**1.8**

An electrooculargraph (EOG) would detect a large amount of electrical activity in these muscles as there is a large amount of eye movement during REM sleep. An electrooculargraph detects, amplifies and records electrical activity in the muscles that move the eyes.

An electroencephalograph (EEG) would detect a prevalence of irregular beta-like waves with a 'sawtooth' pattern during REM sleep. An electroencephalograph detects, amplifies and records electrical activity in the brain in the form of brain waves.

It was essential that students identified the electrical nature of the response detected.

Question 2a.

Marks	0	1	Average
%	77	23	**0.3**

Aphasia is impairment of language as a result of damage to the brain.

Students needed to mention both language impairment and brain damage.

Question 2b.

Marks	0	1	2	Average
%	62	32	7	**0.5**

Functional Magnetic Resonance Imaging (fMRI) would show the area of the brain that is/is not functioning and sites of structural damage to the brain. Broca's aphasia is the lack of functioning or damage in the left frontal lobe near the primary motor cortex; Wernicke's area would be functioning. Wernicke's aphasia is the lack of functioning or damage in the left temporal lobe near the primary auditory cortex; Broca's area would be functioning.

Students were required to identify the properties of fMRI (showing brain structure and function) and the specific location of either Wernicke's area or Broca's area.

Many students described symptoms that would differentiate Broca's and Wernicke's aphasia.

Question 3

Marks	0	1	2	Average
%	29	30	41	**1.1**

The psychology teacher is suggesting that the students use context-dependent cues. These are external, environmental cues in the specific situation where a memory was formed. These conditions provide cues that help the students retrieve the information they learnt in the same context.

This question was generally well answered. The main confusion was when students identified the cues as being state-dependent and did not refer to context.

Question 4

Marks	0	1	2	3	Average
%	49	20	13	18	**1**

Any of the following answers was acceptable:

- Findings: words presented to the right visual field are processed in left hemisphere; patients could read and report words verbally.
  Cognitive process/structure: left hemisphere can identify words and name them.
- Findings: words presented to the left visual field are processed in the right hemisphere; patients are unable to report words verbally, could select item by touch behind screen but were unable to say why selected.
  Cognitive process/structure: right hemisphere can identify words but not name them.
- Findings: when presented with different words on each side of the screen at the same time, patients were able to read and report verbally the word presented to the right visual field.
  Cognitive process/structure: left hemisphere can identify words and name them.
  Findings: when presented with different words on each side of the screen at the same time, patients were unable to verbally report words to left visual field.
  Cognitive process/structure: right hemisphere can process words but cannot name them.
- Findings: when presented with a picture of an object to the right visual field or left visual field and asked to verbally identify the object or reach under the screen and select the object by touch, when picture flashed to left visual field patients were unable to verbally name the object but could pick it up with their left hand.
  Cognitive process/structure: right hemisphere can identify pictures by touch but cannot name them.
- Findings: when presented with a picture of an object to the right visual field or left visual field and asked to verbally identify the object or reach under the screen and select object by touch, when picture flashed to right visual field (processed by left hemisphere), patient could easily name it verbally.
  Cognitive process/structure: left hemisphere can identify pictures and name them.

It was essential for students to address both parts of the question and to show the relationship between the findings and their contribution to understanding.

Question 5a.

Marks	0	1	2	Average
%	51	33	16	**0.7**

Group A: retroactive interference – when new information inhibits retrieval of previously learnt material.
Group B: retroactive interference – when new information inhibits retrieval of previously learnt material.

Students needed to have a good understanding of interference theory to establish that in each case the type of interference being tested was retroactive. After identifying the type of interference, students were not required to define it twice.

Question 5b.

Marks	0	1	2	Average
%	22	15	63	**1.4**

The principal would be most likely to choose Chinese as the second language in her school. According to the interference theory, there will be less retroactive interference between Chinese and French as they are not similar languages. Conversely, there is likely to be more retroactive interference between French and Italian as they are more similar.

This question was well answered.

Question 6a.

Marks	0	1	2	3	Average
%	19	29	38	14	**1.5**

People between the ages of 18 and 40 who sleep fewer than 6.5 hours per night will have a larger Body Mass Index after twelve months than those who sleep more than 6.5 hours per night.

In a research hypothesis, the independent variable and the dependent variable are not operationalised, although students were not penalised for doing so.

Question 6b.

Marks	0	1	Average
%	55	45	**0.5**

Independent groups

Question 6c.

Marks	0	1	2	Average
%	10	26	65	**1.6**

Two of:

- decline in ability to perform cognitive tasks
- slower reaction times on motor tasks
- irrational and illogical thinking
- difficulty completing tasks
- impaired memory processes
- depression
- hallucinations
- delusions (paranoia)
- hand tremors
- drooping eyelids
- slurred speech
- increased sensitivity to pain
- increased emotionality.

Drooping eyes was not awarded a mark.

The question did not distinguish between partial and total long-term sleep deprivation so any of these answers was acceptable.

Question 7

Marks	0	1	2	Average
%	41	36	23	**0.8**

The episodic buffer is the link between long-term memory and other aspects of working memory. The episodic buffer retrieves the knowledge of multiplication tables to calculate how much each customer had to pay.
The central executive controls the man's attention to allow him to calculate how much the customer had to pay or:

- changes the man's attention from one customer's purchase to the next or formed the relevant sum for the multiplication
- obtains the visual images of the relevant multiplication
- instructs the episodic buffer to access knowledge of multiplication from long-term memory.

Question 8a.

Marks	0	1	Average
%	73	27	**0.3**

Either of:

- there is a 3% probability that the difference between the results of the two conditions was due to chance alone
- there is a 97% probability that the difference between the results of the two conditions was due to the independent variable.

The most common error was students indicating that p =.03 meant that 'If the research was repeated 100 times, the same result would occur 97% of the time'.

Question 8b.

Marks	0	1	2	Average
%	30	27	43	**1.2**

That leading questions cause false reconstructions of memories of events (eyewitness testimony). 'Misleading questions' was also acceptable.

Question 8c.

Marks	0	1	2	Average
%	44	47	9	**0.7**

Memory is often a reconstruction of events that may include subsequent experiences such as misleading questions. Eyewitnesses who were asked leading questions gave evidence of more aggression from the 'red gang' because their memories were reconstructed.

It was necessary to refer to the research described in order to gain full marks for this question.

Question 9a.

Marks	0	1	Average
%	80	20	**0.2**

Change blindness is the failure to notice a large/significant change that occurs in full view in a visual scene.

Question 9b.

Marks	0	1	Average
%	91	9	**0.1**

Air traffic controllers would be most likely to experience change blindness when the change occurs simultaneously with a brief disruption in vision. The air traffic controller may blink continually, causing change blindness.

Possible causes of the disruption include eye movements/saccades, eye blink, flicker or blank screen, mud splash, very slow change.

A very frequent error was students describing inattentional blindness instead of change blindness.

SECTION C – Extended answer question

Marks	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average
%	9	9	12	11	12	10	9	7	6	4	4	3	2	1	1	0	**4.8**

This was a new type of requirement for this examination. It is emphasised that it continues to be important to clearly address the key words in the question. Other comments relating to any written response continue to apply.

Students are reminded that they are not penalised for slight spelling errors, but the meaning of what they write must be clear and unambiguous.

Students were assessed against the following criteria.

- identify and describe the key terms/theories/issues
- explain the relevant terms/theories/issues and make connections between psychological concepts and data and research
- use appropriate examples and evidence to support the response
- interpret and analyse the issues/data/information
- evaluate issues/data/information and draw appropriate conclusions

Responses did not need to be in essay form. Point form, tables, diagrams or charts covering some or all aspects of the question were acceptable.

The low mean score for Section C reflected a number of issues, including the following:

- 10% of students did not make any real attempt to answer the question and obtained no marks.
- A large number of students simply wrote about memory in general and did not address the specifics of age-related memory decline or Alzheimer's disease.

- Many students wrote about either age-related memory decline or Alzheimer's disease, but not both.
- Many students addressed only one aspect of description of symptoms, structures involved, and memory processes.
- Many students did not give any examples, relate their answer to the question or provide evidence as required by the assessment criteria.

The table below provides a guide to the content that was appropriate to be included in the response. Students were not expected to include all points for full marks.

Normal age-related memory decline		Alzheimer's Disease
• Is **not** dementia. • Most people show only minor decline in some areas of memory and can remain as mentally sharp as when they were young. • Major loss of mental capacities is a common misconception about ageing. • May be linked more to motivation and confidence than memory loss. • Can be improved (even reversed) with training and by drawing on past experiences.	**Description**	• Is a type of dementia. • A progressive and largely incurable disorder that impairs memory and other cognitive functions. • Occurs mainly in old age (about 1 in 25 over the age of 60 years).
• Neurons in the brain decline in speed of processing (neuronal processing/ transmission) and increase in reaction time. (No widespread loss of neurons and synapses; loss is limited to some areas only.) • Some reduction in size and less activity in frontal lobe, especially prefrontal cortex.	**Key Brain Structures**	• Degeneration of neurons in the brain (brain cells) – neurons become damaged, and brain tissue shrinks and eventually dies. • Presence of amyloid plaques (proteins forming on axon terminals). • Build-up of neurofibrillary tangles (proteins within neurons). • Lower levels of some neurotransmitters involved in memory (for example, acetylcholine). • Usually begins in the hippocampus (and other areas in temporal lobe). • Spreads to the frontal lobe, especially the pre-frontal cortex. • Spreads to other areas of the brain.

• Some memory processes may decline in old age, while others show little if any decline. • Some decline in episodic memory (for example, prospective memory – remembering to do things in the future) • No decline in semantic memory • No decline in procedural memory • Some decline in working memory/short-term memory – (less efficient as may take longer to retrieve declarative memories and process information. There is a link to the decline in speed of processing and increase in reaction time and decline in ability to ignore distractions and divide attention). • Decline in ability to recall information rather than recognise the same information. • Problem solving can take longer. • Decreased performance on complex cognitive tasks. • Memory for recently learnt verbal (not visual) information can be affected. • Can learn new memories, though may take longer.	**Memory Processes Affected**	• Memory loss, forgetfulness, confusion, poor judgment, disorientation, impaired attention. As it progresses, mood and personality can change and loss of other functions (ability to talk, walk, control bladder, etc) can occur. • Initially impaired declarative memory (for example, memory of events and names). • Severe decline in episodic memory (for example, can't recall what happened yesterday). • Severe decline in semantic memory (can't recall well-learned facts; for example, times tables). • Severe decline in procedural memory (for example, forgetting how to tie shoelaces). • Severe decline in working memory/short-term memory. • Trouble recognising close family and friends. • Anterograde and retrograde amnesia. • Loss of ability to learn new tasks.

The following are examples of high-scoring responses.

Example 1

1. Identifies difference – Alzheimer's is neurodegenerative and decline in brain functioning and memory: age-related not inevitable, varies between individuals
2. Age-related decline mainly in episodic memories contrasted with Alzheimer's – eventual decline in all types (though episodic first)
3. Alzheimer's – accurate statement of the biological causes of decline and structures involved: age-related explains through slowing of CNS processing
4. Comparison of rates of decline

- *Alzheimers is an organic neurodegenerative disease (form of dementia) characterised by a progressive loss in the structure and function of brain neurons, resulting primariy in memory decline (as well as changes in personality, and intellectual capabilities).*
- *Alzheimers is not a normal form of aging.*
- *Alzheimers is caused by a build up of the plaque acetylcholine and the loss in axons in the neurons due to binding of spindles*
- *Normal age related memory decline in elderly people may occur because the individual shows lack of concentration (ie, do not believe they can recall information), little motivation (ie. they are not motivated to recall information) or info is difficult to recall based on the memory device used to initially encode it. Some memories in normal age related memory decline are quicker to be lost than others, whereby episodic memories (memories of personal events/experiences) are the first to be lost, followed by semantic memories (knowledge of the world - facts and figures) and finally procedural memory (memory of how to do things, ie. ride a bike).*
- *Alzheimers results in more memory loss because the neurons that where initially formed for the memory die, and therefore cannot be accessed any longer.*
- *This results in symptoms of Alzheimers including memory loss, personality changes, mood changes, decline in intellectual capabilities, etc. whereas normal age related memory decline normaly affects memory to a lesser extent.*

Example 2

1. Explains causes of age-related and Alzheimer's
2. Explains course of decline and memory types in both conditions
3. Identifies memory types and sequence of decline in both conditions provides appropriate statements of comparison and contrast

Ageing does not necessarily result in memory decline. However, many older people do suffer from some difficulties with their memory. Sensory and Short-term memory are largely unaffected by the effects of ageing. Long-term memory is the most affected, particular episodic memory. Formation of new memories (hippocampus) becomes slightly more difficult. Performance on recognition tasks remains the same as the performance by a younger person, however recall becomes more difficult.

Alzheimers disease affects thousands of Australians. It results in an earlier onset of memory decline than compared to normal age-related memory decline. This can affect some individuals when they're 60 years old. Alzheimer's disease can affect a person's ability to remember places, names, events, people and even some activities such as dressing oneself. It has been found that individuals suffering Alzheimer's disease have a significantly smaller frontal lobe of the brain, suggesting it has shrunk due to the disease.

While there is no cure for Alzheimer's disease, there is some understanding as to its cause. Studies have revealed that the brains of people with the disease have plaque and tangles. The plaque is due to a build of the protein 'amyloid' and affects neural networks within the brain. The tangles, too, are due to protein and also affect the brain's networks, affecting retrieval of information.

Alzheimer's disease results in a gradual decline of a person's memory processes. Its onset is earlier than normal age-related memory decline, it affects a wider range of cognitive tasks and results in a much more rapid decline in memory abilities.