



SOLUTIONS

2018

Units 3 & 4 PSYCHOLOGY

Trial examination

SECTION A: Multiple-choice questions

1	C
2	A
3	C
4	D
5	A
6	B
7	C
8	D
9	C
10	A
11	A
12	A
13	B
14	D
15	D
16	C
17	C
18	B
19	C
20	A

21	B
22	C
23	D
24	A
25	A
26	C
27	C
28	B
29	B
30	D
31	B
32	B
33	C
34	B
35	D
36	B
37	A
38	C
39	A
40	C

41	C
42	B
43	C
44	B
45	A
46	C
47	B
48	C
49	D
50	A

Question 1 C

Sensory information is initially detected by the peripheral nervous system, via the sensory organs e.g. skin, eyes, tendons, joints, etc. and conveyed via sensory neurons in the somatic nervous system (a subdivision of the peripheral nervous system) to the central nervous system where the sensory information will ultimately be processed.

Question 2 A

The autonomic nervous system, will trigger simple unconscious responses to sensory stimuli such as pupil dilation when entering a dark room (*as opposed a spinal reflex which is involves both the somatic nervous system (detection & movement) and the central nervous system (where the interneurons integrate sensory and motor information).*)

Question 3 C

The autonomic nervous system operates in a self-regulatory manner, by adjusting biological processes as a result of changing conditions to the body's internal and external environment, largely without conscious thought and thus independently of the brain. *Options A & D refer to the Somatic NS*

Question 4 D

When the body is stressed, cortisol is released into the bloodstream which results in elevated levels of glucose in the bloodstream, an elevated heart rate and respiration rate, etc. which help energise and arouse an individual and increase responsiveness to a threat and thus is helpful in the short-term.

If stress is chronic and high levels of cortisol linger in the bloodstream can deplete the immune system and increase the individual's vulnerability to illness.

Question 5 A

The substantia nigra is an area of the basal ganglia (in the midbrain) that plays a major role in Parkinson's disease. Due to the degeneration of the dopamine producing neurons in the substantia nigra there is a lack of dopamine relayed to the nearby striatum (which plays a key role in motor control). The lack of dopamine causes a variety of motor symptoms.

Question 6 B

Glutamate is stored in the vesicles of the axon terminal and released into the synapse via an action potential.

Question 7 C

Glutamate is the major excitatory neurotransmitter in the central nervous system

Question 8 D

Glutamate first reaches the NMDA/AMPA receptors which are located on the dendrites of the postsynaptic neurons.

Question 9 C

Zoe's primary appraisal of the situation is an evaluation of the significance of her situation, her secondary appraisal would be a more cognitive determination of whether she has the energy & resources to cope with the stressor. Options B and D are coping options which come after the primary and secondary appraisals (emotion and problem-based coping methods are no longer on the VCAA course)

Question 10 A

See the explanation from question 9.

Question 11 A

Zoe's anxiety response is an example of distress which is a negative psychological response to a stressor.

Question 12 A

Dr. Spiteri gathered primary data via her experimentation with the 46 participants (original data) that generated quantitative data via the mean and standard deviation of the scores for the amount of words recalled.

Question 13 B

Adrenaline would have been released in response to the emotionally arousing sound of the gunshot which in turn can trigger the release of noradrenaline which activates the emotional part of the brain the amygdala, the amygdala signals to the nearby hippocampus that the details of this event are important which strengthens the consolidation of the memory of the event.

Question 14 D

The amygdala plays a key role in the consolidation of the emotionally arousing aspects of the fear experienced in response to the sound of the gunshot.

Question 15 D

Based on the results of the experiment, the impact of an emotionally arousing event such as the unexpected sound of a gunshot has enhanced the recall of explicit memories as reflected by the significantly higher recall of the 10 words in comparison to the baseline control group whom were not exposed to an emotionally arousing event. *Note there have been a variety of the experiments conducted on the impact of arousal and the release of adrenaline on the accuracy of memory with conflicting results i.e. in some cases a high level of arousal during an event will diminish the accuracy of the recall of semantic information, other experiments have found the opposite to the case. The key to this question is to address the results generated for this scenario as the question simply requires a conclusion for the sample tested.*

Question 16 C

The standard deviation provides a measure of the spread or variation of scores from the mean. *The mean is a measure of central tendency.*

Question 17 C

The participants were allocated to the experimental group and control group via their predetermined tutorial groups (Group A & B) thus the allocation was non-random as the participants did not have an equal chance of being selected to either group.

Question 18 B

Iconic (visual sensory) memory has a duration of @ 0.3 seconds.

Question 19 C

Millie's inability to retrieve Alex's name could be best explained by her failure to use elaborative rehearsal and thus successfully encode her name by linking it with existing material in LTM. *The context and state of Millie's initial exposure to the name were identical to her context and state when trying to recall which eliminates options A & B as possible answers in this case (given her failure to recall the name).*

Question 20 A

Due to the ordered recall of the digits based on their serial position, Isabelle would have experienced a reduced recency effect which can be attributed to the limitations of her STM in only being capable of maintaining a few of the digits for up to 20 seconds without rehearsal, thus her recall of the latter digits would be reduced. Due to the additional attention and rehearsal of the first few digits, Isabelle would be more likely to demonstrate a primacy effect as these digits would be more likely to be stored in LTM. Consequentially her recall would be highest for the earlier digits.

Note: if free recall (recalling the digits in random order) was used then Isabelle would be expected to have both a primary and recency effect, but this is not appropriate for a sequential list of material such as the VCAA student number.

Question 21 B

The antecedent in this case is Emily being approached by a dog whilst running.

Emily's behaviour is to spray the dog.

The consequence is the dog backs off (a negative reinforcer)

Question 22 C

The consequence in this case is the dog backing off after being sprayed (a negative reinforcer).

Question 23 D

From Emily's point of view the use of a water pistol is negatively reinforced by the dogs ceasing to hassle her whilst running. The aversive pestering of the dogs is being reduced/removed, which will strengthen her behaviour of carrying/using the water pistol as a deterrent.

Question 24 A

The dogs that are sprayed for approaching Emily are learning via positive punishment to stop pestering runners. The stimulus added is the spray, which is intended to weaken their pestering behaviour.

Question 25 A

Daydreaming has a relatively higher level of awareness than the other three options, thus it is higher on the continuum of consciousness (which is determined by the relative level of awareness).

Question 26 C

High levels of amplitude on an EEG are reflective of a lower level of awareness. Alcohol is a depressant which slows down neural transmission in the central nervous system and thus reduces the level of awareness in comparison to a normal waking consciousness or an individual that is under the influence of a stimulant e.g. cocaine or caffeine.

Question 27 C

According to the restoration theory of sleep, slow-wave sleep (stages 3 and 4 of NREM sleep) plays a key role in recovery from sustained physical exertion as evidence by case studies of individuals whom experienced significantly higher proportions of stages 3 & 4 NREM sleep proportions after completing ultra-endurance activities in comparison to their normal slow-wave sleep proportions..

Question 28 B

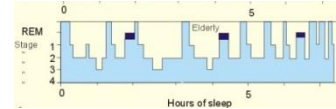
Due to cataplexy (muscle atonia) an EMG which detects, amplifies and records the electrical activity of muscles would typically record the lowest level of electrical activity during REM sleep.

Question 29 B

According to Loftus, leading questions may contain information the person is questioning a witness is looking for and results in unreliable eyewitness testimony. When endeavouring to retrieve a memory, the witness must reconstruct the memory of an event by potentially integrating from two different sources and the true source of a memory and another source derived from the misinformation in a leading question potentially resulting in a false memory.

Question 30 D

Minimal periods of stages 3 and 4 of NREM sleep are the key indicators that the hypnogram is depicting the sleep cycles of an elderly person (*as well as the duration of sleep @ 7 hrs*).

**Question 31 B**

Sleepwalking is a type of parasomnia, which are a group of sleep disorders that disrupt sleep due to inappropriate psychological or physiological activity.

Question 32 B

Sleepwalking episodes are most likely to occur during stages 3 and 4 NREM sleep during the first two sleep cycles. *It generally takes an adult half an hour or more to reach this stage after first falling asleep (which eliminates option A)*

Question 33 C

During sleepwalking episodes, an EMG would be expected to record a relatively high level of electrical activity of the muscles in comparison to readings during REM sleep in particular. *The EEG records the electrical activity of the brain, whilst the EOG records the electrical activity of the eye muscles that control eye movements.*

Question 34 B

One of the limitations of this study sleepwalking is that episodes are more likely to occur in a familiar environment than in a sleep laboratory. *Sleepwalking most commonly occurs during childhood, but approximately 1-5% of adults have been reported as experiencing sleepwalking episodes. Episodes tend to be brief, lasting for a just a few minutes and researchers would need to receive permission (by an ethics committee) to record the activity of sleepwalkers providing they had given their informed consent and other necessary ethical guidelines were followed.*

Note: this question is admittedly testing 'obscure knowledge' and thus requires an application of knowledge as well as a process of elimination of multiple-choice options in preparing for the occasional questions from obscure parts of the course that feature annually in VCAA examinations.

Question 35 D

Episodes of over breathing triggered by anxiety resulting in excessive levels of oxygen entering the body, causing an imbalance (low levels) of carbon dioxide in the brain resulting in dizziness and light headedness. Breathing retraining which will help her by increasing the level of carbon dioxide in the brain in order to reduce her anxiety evoking symptoms.

Question 36 B

The use of bright light therapy early in the morning in treating the effects of delayed sleep phase onset is intended to advance the circadian phase and thus trigger the earlier release of melatonin in the evening, thus assisting the patient go to sleep earlier and have a more restful sleep.

Question 37 A

Sleep-onset insomnia is a type of dyssomnia that persistently makes it difficult for the sleeper to fall asleep. CBT can be an effective means of treating insomnia which can often be attributed by negative attitudes about sleep which can be addressed by the processes involved in CBT as a form of treatment. *Parasomnias such as sleepwalking disrupt sleep and are more affected by biological processes and thus less affected by the patient's thought processes relating to sleep (in comparison to dyssomnias). Likewise the effects of jetlag are due to disruptions in circadian phase thus is more effected by biological processes (than cognitive processes).*

Question 38 C

Benzodiazepines are a type of depressant as is the case with alcohol. Depressants slow down central nervous system and thus have a calming effect on the body, as opposed to stimulants such as caffeine, nicotine and cocaine.

Question 39 A

Systematic desensitisation works by asking patients to create a fear hierarchy of approximations of their conditioned stimulus (the fear evoking stimulus e.g. heights).

Question 40 C

According to Bandura Observational learning can result in behaviour that may not be demonstrated until long after it has been learned. i.e. if an individual observes behaviour, the cognitive processes involved in learning behaviour may have occurred, but might not be demonstrated until an antecedent is presented which then results in the learned response from the observer.

Question 41 C

Hallucinations are sensory distortions that can occur after prolonged periods (72 hours plus) of total sleep deprivation. The other three options are all potential symptoms of partial sleep deprivation (*as is the case with this scenario*).

Question 42 B

A poor response to medication that can inhibit the recovery from a mental condition (a biologically perpetuating factor). *Genetic vulnerability is a predisposing (not perpetuating) factor, self-efficacy is a predisposing psychological (not biological/perpetuating) factor, a disorganised attachment is a predisposing social (not biological/perpetuating) factor.*

Question 43 C

The use of the placebos in this experiment could be argued to breach informed consent as the participants were not aware of the use of placebos. *There is no evidence in the scenario of coercion of the students (a breach of voluntary participants) or a refusal of their withdrawal rights, or the failure to debrief the participants at the conclusion of the experiment.*

Question 44 B

Cumulative risk refers to the accumulation of biological, psychological and social risk factors that can either contribute to the development of a mental condition or exacerbate the severity of a mental condition. These can be a combination of predisposing factors e.g. genetics, precipitating factors e.g. the loss of a significant relationship and perpetuating factors e.g. substance abuse. Protective factors such as good diet, exercise, CBT strategies, support networks can be applied to prevent the occurrence or re-occurrence of a mental condition.

Question 45 A

This experiment used a convenience sample of readily available VCE students – whom were tested using a repeated-measures research design by measuring their anxiety levels firstly when consuming Clonidine and then when consuming placebos.

Question 46 C

The use of Clonidine vs placebos was the IV: the variable manipulated to test the effects of the medication on the student's self-rated level of anxiety (the DV)

Question 47 B

The use of the Clonidine for the treatment of anxiety is intended to act as a protective factor which in this case is intended to prevent the reoccurrence of the symptoms of anxiety experienced by the participants.

Question 48 C

Stigma as a barrier to accessing treatment for a mental condition can act as a perpetuating factor that contributes to the development and progression of a mental condition as the patient is reluctant to seek assistance for their condition due to the fear of being labelled, thus delaying their potential recovery.

Question 49 D

Evie is experiencing precontemplation as she is yet to demonstrate awareness of her problematic behaviour.

Question 50 A

When Evie starts weighing up the pros and cons of changing her socially avoidant behaviour during the contemplation stage, she is now ready to change.

SECTION B: Short-answer questions**Question 1 (14 marks)**

- a. *Explain the role of a biological factor that may promote resilience in helping maintain mental health for adults dealing with the demands of being a single parent*
- **Adequate diet:** A diet that provides adequate amounts of complex carbohydrates, essential fats, amino acids, vitamins, minerals and water plays a key role in maintaining mental health. Likewise not relying on drugs, alcohol, cigarettes to cope with mental health problems.
 - **Sleep:** It is believed that good sleep hygiene helps foster both mental and emotional resilience. Adequate sleep is reflected by waking up feeling refreshed and positive about the day ahead.

2 marks

1 mark for identifying a biological factor, 1 mark for explaining how it promotes resilience.

- b. *Describe how exercise could be considered an avoidant-coping strategy rather than an approach strategy for dealing with the stress from single-parenting*
- Exercise could be considered as an effort to evade a stressor and deal indirectly with its effects on single-parenting.
 - Thus even though exercise has some benefits as a strategy for coping with stress, it is not an approach strategy as it is not dealing directly with the demands of being a single parent.

2 marks

1 mark for explaining what is meant by an avoidant coping strategy, 1 mark for a clear explanation for why exercise does not deal with the source of the stressor in this scenario (and is thus not an approach strategy).

c. Identify and explain a limitation of the research design used in Dr Jay's experiment

- Dr Jay used an independent-groups research design.
- Which is less effective than repeated-measures or matched-participants in controlling the impact of participant-related variables on the DV (stress related scores)
- Such as the support they receive from their family, friends, spouse in dealing with demands of being a single-parent, or any pre-existing mental health issues (prior to separation from their spouse), etc.

3 marks

1 mark for naming the research design, 1 mark for identify the limitation, 1 mark for clearly linking the limitation to the scenario.

d. Describe an advantage and a limitation of the use of the mean to compare the scores of the four groups in this study.

Advantage of the use of the mean: it provides a measure of central tendency by providing a summary figure for the stress-inventory scores of the four groups, which provides a useful point of comparison

Limitation: if the data scores are widely and unevenly spread then the mean may be misleading, which is particularly likely in this case given the small group sizes (9-12 participants per group)

2 marks

e. Compare the data from the four groups and write a conclusion on the findings

From the results of the stress inventory tests

- It appears that alcohol abuse has a significant effect on the stress ratings of patients based on the results for both group 1 (exercisers who consume alcohol) and group 3 (non-exercisers who consume alcohol) who have an average score just below the high-risk threshold for mental health concerns and are significantly higher than the stress ratings of the non-alcohol consuming groups 2 and 4.
- Regular exercise has not been an effective strategy for reducing the stress ratings for the sample tested as reflected by the similarity of scores for the group 1 (exercisers who consume alcohol) and group 2 (exercisers who do not regularly consume alcohol)
- Regular exercise does not offset the effects of alcohol as highlighted by the similarity of the results for group 1 (exercisers, that consume alcohol) and group 3 (non-exercisers that also consume alcohol).

3 marks

1 mark for highlighting that alcohol increases stress ratings (with references to the scores for group 1 vs 3)

1 mark for highlighting that exercise on its own does not reduce stress for the sample tested (with reference to groups 1 & 3 vs. groups 2 & 4)

1 mark for highlight that exercise does not offset the effects of alcohol (with reference to groups 1 and 3)

f. Evaluate the validity of Dr Jay's experimental findings

- Validity in Psychological research refers to how effectively an assessment tool measures what is supposed to measure.
- The use of the self-reported stress inventory test, may lack validity depending on how accurately it measures stress levels, likewise the recording and categorisation of alcohol consumption might not be accurate due to misunderstanding of some of the questions used or the meaning of a 'standard drink'

2 marks

1 mark for an explanation of validity, 1 mark for a clear link to the scenario in terms of the evaluation

Question 2 (7 marks)

a. Describe one advantage of using an experiment as opposed to alternative types of research investigation in this case

- Dr Salmon can easily control the key variables, namely the independent variable: the use of levodopa and the dependent variable: the means of measuring its effectiveness via a series of motor/non-motor tests in a laboratory setting.
- Dr Salmon will then be able to make cause and effect statements in terms of the effects of the IV on the DV i.e. the effectiveness of levodopa in treating the symptoms of Parkinson's disease. As opposed to case studies, naturalistic observations or self-reports where there is a lack of control over key variables, making it more difficult to make reliable cause and effect statements.

2 marks

b. Describe the role of a control group in Dr Salmon's experiment

- Dr Salmon could use a group of Parkinson's disease patients whom would not be exposed to the levodopa medication (the IV) and possibly a placebo (instead) in order to act as a control group
- And thus serve as a baseline level of comparison to a group of patients in the experimental group whom will be exposed to the levodopa and thus help determine the effectiveness of the drug in treating the motor/non-motor symptoms of Parkinson's disease.

2 marks

1 mark for explaining that the control group will not be exposed to the medication (IV), 1 mark for stating that they will serve as a baseline level of comparison to the experimental group.

c. Explain how levodopa can work as dopamine agonists in terms of the lock and key mechanism

- The levodopa represents the keys
- The dopamine receptors (in the basal ganglia) represent the locks.
- The levodopa would be similarly shaped to the dopamine neurotransmitters and thus when the levodopa (keys) binds with the dopamine receptors (the locks) it will ideally have an agonistic effect by mimicking the effects of the dopamine and reducing the motor symptoms caused by dopamine deficiencies.

1 mark for simply identifying the lock (the receptors), 1 mark for simply identifying the key (the levodopa), 1 mark for explaining how the medication will mimic the effects of dopamine.

Question 3 (6 marks)

Using the language of classical conditioning, describe how Laura could use the 'Mavala' to extinguish her finger nail biting for the 3 stages of conditioning.

Baseline

NS: fingernail biting - elicits no aversive response.

UCS: Mavala sucked on her nails - elicits a nauseous feeling (UCR).

Acquisition

Laura repeatedly coats her fingernails with Mavala (UCS), thus when she bites her nails (NS) she feels nauseous for several minutes (UCR).

Post conditioning

After weeks of this treatment, the mere thought of biting her nails (CS) causes her to feel cramps in her stomach in anticipation of the nauseous feeling from the treatment (CR).

1 mark for correctly identifying the NS/CS.

1 mark for correctly identifying the UCS.

1 mark for correctly identifying the UCR.

1 mark for correctly identifying the CR.

1 mark for correctly discussing the repeated pairing of the NS/UCS during acquisition

1 mark for correctly describing the extinction of the nail biting in the post conditioning stage.

Question 4 (12 marks)

a. One of the cited limitations of the experiments was determining the consciousness of participants during the testing phase. Why is consciousness considered a psychological construct?

- Consciousness cannot be directly measured
- It can only be constructed or inferred via physiological and/ or psychological indicators.
- It is only believed to exist, but it needs to be constructed to describe it.

1 mark for the first point; 1 mark for either of the 2nd or 3rd points

2 marks

b. How could an EEG be used to measure the consciousness of participants

- It detects, amplifies and records the
- electrical activity of the brain.

2 marks

c. Distinguish between a controlled process and an automatic process

A controlled process is a task that requires selective attention i.e. a high degree of mental effort to complete. E.g. solving a difficult mathematical problem

An automatic process refers to tasks that require a lower level of mental effort to completed and thus can be performed via divided attention. E.g. watching a computer screen for an extended period and hitting the space bar in response to the occasional flashing light.

2 marks

d. Compare the predicted results between the three groups in terms of the effects on cognition, concentration and mood.

Cognition:

Group 3: participants would be expected to have a higher level of cognition in terms of their memory and performance on tasks that were either automatic or controlled processes in comparison to groups 1 & 2 & higher level of performance on controlled processes than group 2 and (generally) group 1.

Group 1: participants would be expected to experience impairments in memory performance and performance on simple tasks (automatic processes), potentially there would be a (comparatively) lesser impact of sleep deprivation on the performance of controlled processes, particularly if the tasks were brief and interesting.

Group 2: the effects of alcohol would have a similar effect on cognition to group 1, except the alcohol would also equally diminish their performance on their ability to perform controlled processes.

Concentration

Group 3: participants would be expected to have a higher level of concentration than groups 1 & 2

Groups 1 & 2: would experience similar impairments in their level of concentration as in both cases alcohol and sleep-deprivation would diminish concentration and attention span.

Mood

Group 3: would experience a more stable level of emotional awareness and thus respond appropriately to various emotive scenarios.

Group 1: would be expected to be more moody and irritable than group 3 (and possibly group 2 as well).

Group 2: the effects of alcohol could enhance their mood and their overall confidence (or they could be as moody and irritable as group 1, thus the effects of alcohol on mood are less predictable than the effects of sleep deprivation.

6 marks

2 marks allocated for each of the three effects; the response needs to address similarities and differences between groups 1 & 2 along with referencing combined (experimental) differences for groups 1 & 2 vs. the control condition of group 3.

Resilience to life stressors

- High self-esteem and high self-efficacy, they are optimistic, flexible and adaptable, organised and make realistic plans and maintain caring relationships

1 mark for identifying the characteristic, 1 mark for a suitable explanation.

Note: these are the 3 characteristics listed on the study design, thus whilst other responses such as referring to sleep patterns could be considered correct, students are encouraged to stick with the content listed in the study design.

Question 8 (9 marks)

a. Define a phobia

A phobia is an intense, irrational and persistent fear of a specific object or situation

1 mark

b. Explain how operant conditioning may have perpetuated Lew's phobia

- Lew's phobia may have been negatively reinforced
- Through avoidance of immunisation days at school, which would have strengthened his phobic condition by reducing his fear through the non-exposure to the needles used for injections (for immunisations).

2 marks

1 mark for identifying the use of negative reinforcement, 1 mark for clearly linking response to scenario and explaining how the phobia would have been strengthened through avoidance

c. Identify and describe a type of cognitive bias that may have perpetuated Lew's phobia

- Memory bias: Lew may have an exaggerated recollection of his reaction to the injection as a child in terms of the severity of his pain and treatment
- Catastrophic thinking: Lew may imagine fainting and hitting his head if he is required have an injection
- Attentional bias: Lew may focus on the length of the needle, ignoring details such as how thin it is and what part of his body will be injected.

2 marks

1 mark for identifying a type of bias, 1 mark for an explanation clearly linked to the scenario

d. Explain how Xanax can be used to treat Lew's phobic disorder

- Xanax acts as a GABA agonist by targeting and changing the shape of the GABA receptors.
- When Xanax binds with the GABA receptors it triggers an influx of negatively charged chloride ions to permeate the postsynaptic neuron which has a (depolarising) inhibitory effect which makes the postsynaptic neuron less likely to fire, thus providing a calming effect on the nervous system.

2 marks

1 mark for identifying the effect of the Xanax (the Benzodiazepine) on the GABA receptors, 1 mark for describing the calming effect of Xanax.

e. In terms of the mental health continuum, describe two indicators that Lew's phobia is merely a mental health problem (as opposed to a mental disorder)

- The threat of the phobic stimulus only causes temporary impairment/ or the threats are only mild (not disabling)
- In Lew's daily functioning/social or emotional wellbeing

2 marks

1 mark for reference to a temporary or a mild response, 1 mark for relating response to daily functioning or any other relevant factor on the M.H continuum.

Question 9 (10 marks)

Theory

Stress – is a state of physiological or psychological tension produced by internal or external forces

Exercise Is an activity that involves physical exertion in order to improve or maintain one's physical condition. Particularly aerobic exercise which requires a sustained increase in HR & respiration

Physical exercise has following benefits (with varying levels of empirical evidence)

1. It uses up the stress hormones far more rapidly (than rest), thus a long run is a great way of ridding the body of the cortisol and adrenaline that are lingering in the blood stream as a result of the stress derived from the demands of VCE.
2. Exercise helps reduce muscle tension associated with high Sympathetic NS activity.
3. Releases beta-endorphins which improves mood, reduces stress as well as pain.
4. Increases the efficiency of the cardiovascular system, which means the body is better equipped to deal with future stressors.
5. Exercise can help us focus on breathing and thus perfecting a repetitive motion that can lead to a sense of 'calm'.
6. Exercise can also provide some 'time out' by diverting attention away from a lingering stressor.

Conclusion: The hypothesis that Year 12 students who regularly exercise will experience a lower level of stress than non-exercisers was supported based on the significance of the results of the experiment.

Implications: This experiment has empirically demonstrated the value of physical activity as a means of reducing the effects of stress for Year 12s who are exposed to a high degree of stress over the course of the year. Schools and families should be encouraged to help Year 12 students structure time in their daily routine to engage in 30 minutes or so of aerobic exercises in order to help prevent the onset of stress-related conditions

Evaluation of statistics

The means provided a useful measure of the central tendency for the change in the stress levels inventory scores over the course of the semester i.e. given the matching of the pre-experimental scores for the 50 participants the post-experimental means were substantially higher for the non-exercising group as reflected by the increase in stress-inventory mean scores 26.6 (77.5 start – 50.9 end) vs 7.1 (58.1 start – 51.1 end) thus enabling researchers to conclude that the exercising group of students experienced a significantly lower increase in their stress levels over the course of the semester in comparison to the non-exercising group (nearly a 400% difference 26.6 vs 7.1).

The spread of score was significantly higher for the exercising group, which reflects a significantly larger degree of spread of scores from the mean and possibly more outliers than the non-exercising group – 23.1 vs. 12.2 (nearly a 200% discrepancy in the spread of scores from the mean) as opposed to the similar spread in scores for the two groups at the start of the experiment

Given the large standard deviation of the post-experiment scores of the exercising students, it indicates that the scores are not clustered around the mean which indicates the mean may be limited in terms of the use a summary figure used for comparison between the two groups – a table of the scores would also be useful.

Validity and Reliability

The validity of the data is determined by how accurately the stress inventory test can measure the stress levels of Year 12's which could be compromised by the wording of the questions along with other extraneous variables e.g. placebo effects due to the expectations of the Year 12s chosen to participate,

non-standardised procedures – where were the participants tested – at home or school? This could affect the validity.

Reliability could be evaluated by replicating the experiment the following term to see how consistently the scores are over time (internal reliability) or using other sample groups e.g. boys schools, co-ed schools, government schools to evaluate the external reliability based on the consistency of scores for different sample groups tested (external reliability)..

Evaluation of the research design

The use of a matched-participants research design

Strength: it was more effective than an independent-groups research design in controlling participant-related variables in this case their existing levels of stress given they were matched on their pre-existing level of stress.

Limitations: other factors such as their level of family support could have also influenced their levels of stress – these factors were not matched and thus a repeated-measures design would have been more effective in controlling these potential participant related variables.

five participants from the experimental (exercising) group dropped out due to illness/injury thus in order to retain the matched equivalence of the groups, their matched partners results/participation were removed from the experiment thus wasting time/resources.

Marking allocation

9-10 marks: the student has demonstrated a high level of understanding of the manner in which exercise can reduced the effects of stress. The student has provided an accurate conclusion based on the significance of the results. The student has provided a detailed evaluation of the descriptive statistics from the scenario including an evaluation of the use/value of the mean and standard deviation. The student has provided a detailed evaluation of the validity and reliability of the findings and has provided a detailed evaluation of the research design that clearly relates to the scenario.

7-8 marks: the student has demonstrated a majority of the following: a high level of understanding of the manner in which exercise can reduced the effects of stress. The student has provided an accurate conclusion based on the significance of the results. The student has provided a detailed evaluation of the descriptive statistics from the scenario including an evaluation of the use/value of the mean and standard deviation. The student has provided a detailed evaluation of the validity and reliability of the findings and has provided a detailed evaluation of the research design that clearly relates to the scenario.

5-6 marks: the student has demonstrated some of the following: an understanding of the manner in which exercise can reduced the effects of stress. The student has provided an accurate conclusion based on the significance of the results. The student has provided an evaluation of the descriptive statistics from the scenario including an evaluation of the use/value of the mean and standard deviation. The student has provided an evaluation of the validity and reliability of the findings and has provided an evaluation of the research design that clearly relates to the scenario.

3-4 marks: the student has only demonstrated one or two of the following: an understanding of the manner in which exercise can reduced the effects of stress. The student has provided an accurate conclusion based on the significance of the results. The student has provided an evaluation of the descriptive statistics from the scenario including an evaluation of the use/value of the mean and standard deviation. The student has provided an evaluation of the validity and reliability of the findings and has provided an evaluation of the research design that clearly relates to the scenario.

0-2 marks: the student has only addressed some of the criteria of the question.