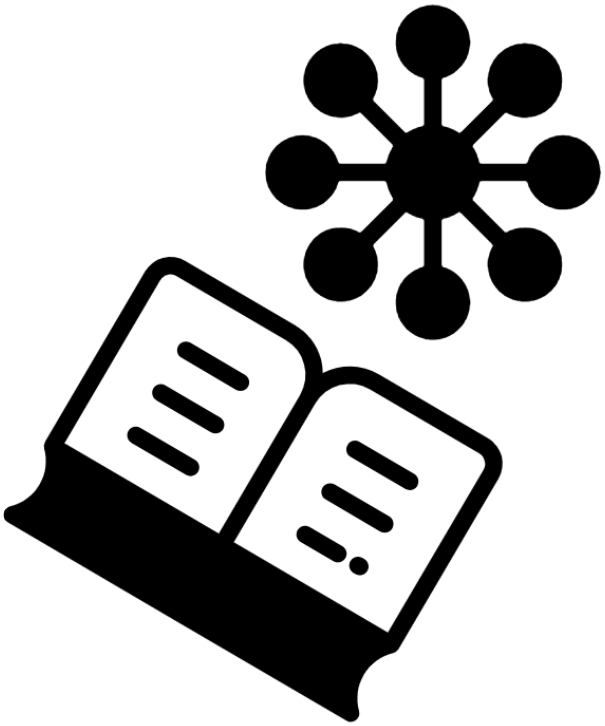
Department of Education

GOVERNMENT OF WESTERN AUSTRALIA

Year 12 SELF Cognition Theories of Learning



U3ATPSY

Year 12 SELF – Cognition
Theories of Learning

Syllabus Points Covered

- *theories and processes of learning*
  - *classical conditioning*
  - *operant conditioning*
  - *observational learning*

Instructions:
Carefully read and make notes on the following material.
Complete all activities.

LEARNING

Learning is the process of acquiring new and lasting information or behaviours. There are two important parts to the classification of learning:

- the lasting change (a simple reflexive reaction is not learning)
- the mental process involved in obtaining and maintaining information.

Learning can be **simple learning**, such as habituation (an organism's decreasing response to stimuli with repeated exposure) or the "mere-exposure effect" (a learned preference for a stimulus after being previously exposed).

Most learning is **complex or behavioural learning**. This is where a stimulus event provokes a response. This includes classical conditioning, operant learning and observational learning.

CLASSICAL CONDITIONING – Pavlov
One of most famous contributors in the study of learning is Ivan Pavlov (1849-1936). Originally studying salivation and digestion, Pavlov stumbled upon what has become known as "classical conditioning" while he was experimenting on his dog.

Classical Conditioning: a form of learning that occurs when a previously neutral stimulus is linked to another neutral stimulus and therefore acquires the power to elicit a consistent and innate **reflex**. Upon repetition, the individual will come to expect this response.

Pavlov discovered that a neutral stimulus, when paired with a natural reflex-producing stimulus, will begin to produce a learned response, even when it is presented by itself.

There are 5 main components of classical conditioning. They are:

- **Neutral Stimulus (NS)** - any stimulus that produces a non-conditioned response prior to learning
- **Unconditioned Stimulus (US)** – a stimulus that automatically (without conditioning or learning) provokes a reflexive response
- **Unconditioned Response (UR)** - a response resulting from an unconditioned stimulus without prior learning
- **Conditioned Stimulus (CS)** - a formerly neutral stimulus that gains the power to cause the response
- **Conditioned Response (CR)** - a response elicited by a previously neutral stimulus that has become associated with the unconditioned stimulus.

Click this link to view an illustrated example of the process of Pavlov's Classical Conditioning: https://www.dogalize.com/wp-content/uploads/2018/03/pavlovdog.jpg

During acquisition, a NS is paired with the US. After several trials the neutral stimulus will gradually begin to elicit the same response as the US. **Acquisition** is the term given to the learning stage during which a CR comes to be elicited by the CS.

ACTIVITY 1

1. Complete the table below describing the five components of classical conditioning in Pavlov's experiment.

Component	Example in Pavlov's Experiment
Neural stimulus	
Unconditioned stimulus	
Unconditioned response	
Conditioned stimulus	
Conditioned response	

2. Complete the table below describing the five components of classical conditioning for the following example –
Jamie got into the habit of yelling "Bye Mum" and then slamming the door loudly when she left for school in the morning. The door slam caused her mother to flinch. After several days of this, Jamie's mother begins to flinch at the sound of the phrase "Bye Mum" being yelled.

Component	Example in Scenario
Neural stimulus	
Unconditioned stimulus	
Unconditioned response	
Conditioned stimulus	
Conditioned response	

Extinction is the diminishing (or lessening) of a "conditioned" response, when an unconditioned stimulus does not follow a conditioned stimulus. To acquire a CR, we repeatedly pair a NS with the US. If we want to reverse this learning, we only need to weaken the strength of the connection between the two stimuli. It is important to realize that extinction does not mean complete elimination of a response. Extinction merely suppresses the CR, and the CR can occasionally reappear during spontaneous recovery.

Spontaneous Recovery is the response after a rest period of an extinguished conditioned response. Spontaneous recovery is weaker than the original CR.

EXAMPLES OF CLASSICAL CONDITIONING

If a student is bullied at school, they may learn to associate school with fear. This could happen if a student is repeatedly humiliated or punished in class by a specific teacher. It could also explain why some students show a particular dislike of certain subjects for their entire academic career, regardless of its actual difficulty.

Little Albert

In a famous, though ethically dubious, experiment Watson and Rayner (1920) showed for the first time that classical conditioning could apply to humans. Little Albert was a 9-month-old infant who was tested on his reactions to various stimuli. He was shown a white rat, a rabbit, a monkey and various masks. Albert was described as "on the whole solid and unemotional" showed no fear of any of these stimuli. However, he was afraid if a hammer was struck against a steel bar behind his head. The sudden loud noise would cause Albert to burst into tears.

When Albert was just over 11 months old the white rat was presented and seconds later the hammer was struck against the steel bar. This was done 7 times over the next 7 weeks and each time Albert burst into tears. By now Albert only had to see the rat and he immediately showed every sign of fear. He would cry (whether or not the hammer was hit against the steel bar) and he would attempt to crawl away.

In addition, Watson and Rayner found that Albert developed phobias of objects which shared characteristics with the rat, including the family dog, a fur coat, some cotton wool and a Father Christmas mask. This process is known as **generalisation**.

Click this link to watch the film of the experiment:
https://en.wikipedia.org/wiki/File:Little_Albert_experiment_(1920).webm

Watson and Rayner had shown that classical conditioning could be used to create a **phobia**. A phobia is an irrational fear (a fear that is out of proportion to the danger).

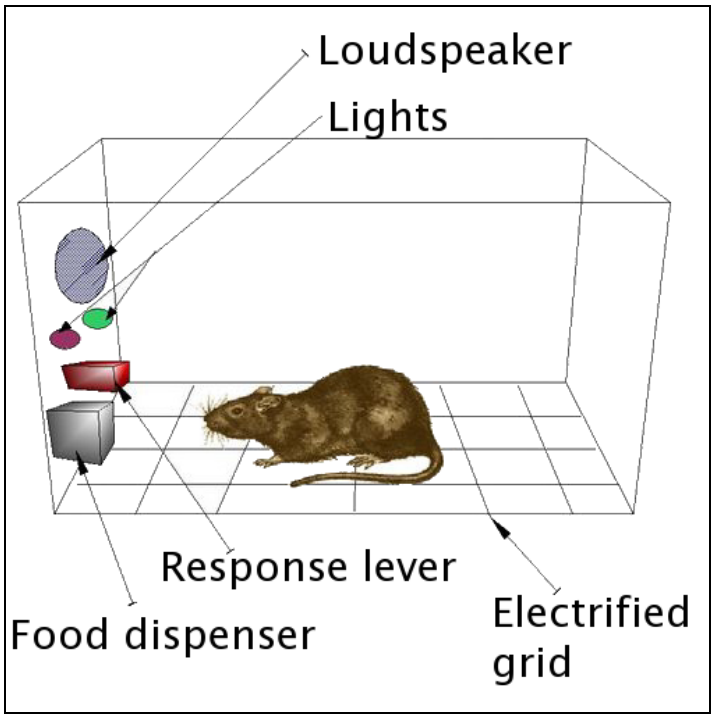
Over the next few weeks and months Albert was observed and, 10 days after conditioning, his fear of the rat was much less marked. This dying out of a learned response is called extinction. However, even after a full month it was still evident, and the association could be renewed by repeating the original procedure a few times.

OPERANT CONDITIONING – Thorndike & Skinner

Operant Conditioning is a form of learning in which the probability of a behavioural response is changed by its consequences; that is, by the stimuli that follows the response. An operant is an observable behaviour that an organism uses to "operate" in its environment. Behavioural responses are strengthened when followed by reinforcement and diminished when followed by punishment.

Much of the early work on operant conditioning came from **E L Thorndike**. He studied cats in puzzle boxes and rats in mazes. He proposed that animals learn responses through experiencing consequences. Animals repeat desired responses and stop doing responses that are punished in some way. This was called the **Law of Effect**.

B F Skinner became famous for his ideas in behaviourism and his work with rats. Skinner's experiments extended Thorndike's thinking, especially his law of effect. Using Thorndike's law of effect as a starting point, Skinner developed the **Operant chamber, or the Skinner box**, to study operant conditioning. Operant Chamber is a chamber with a bar or a key that an animal can manipulate to obtain a food or water reinforce while an attached device records the animal's rate of bar-pressing or key turning.



The Skinner Box

By Andreas1 - Adapted from Image: Boite skinner.jpg, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=5709267

Reinforcers

A reinforcer is a condition in which the presentation or removal of a stimulus that occurs after a response (behaviour) strengthens that response or makes it more likely to happen again in the future.

- **Positive Reinforcement** is a stimulus presented after a response that increases the probability of that response happening again.
  - Eg. Getting paid for good grades or gaining privileges at home for good behavior

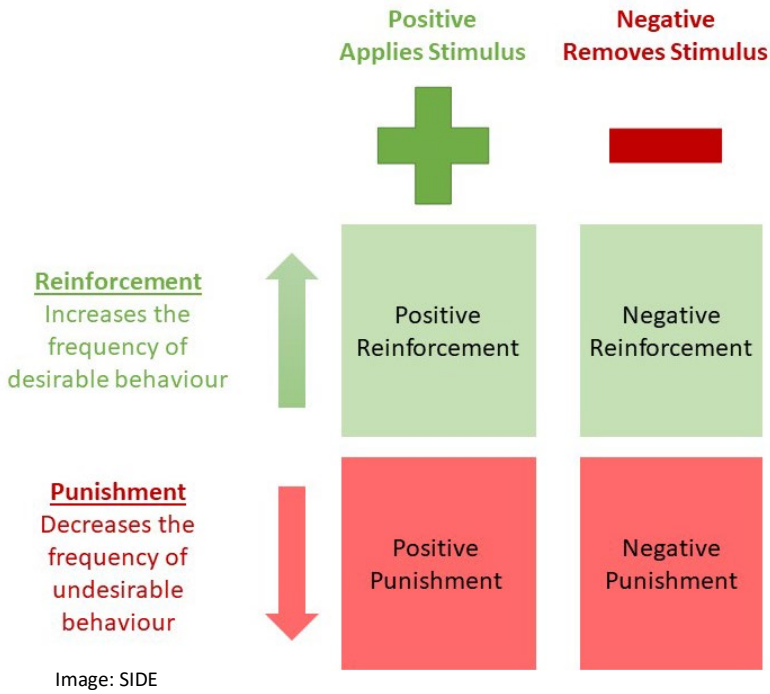
- **Negative Reinforcement** is the removal of an unpleasant or adverse stimulus that increases the probability of that response happening again.
  - Eg. Taking Advil to get rid of a headache.
  - Eg. Putting on a seatbelt to make the annoying seatbelt buzzer stop.

Punishments

A punishment is an averse/disliked stimulus which occurs after a behaviour, and decreases the probability it will occur again.

- **Positive Punishment** is an undesirable event that follows a behaviour.
  - Eg. Getting detention after cheating on a test

- **Negative Punishment** is when a desirable event ends or when an item is taken away after a behaviour.
  - Eg. Getting your mobile phone taken away after failing multiple classes on your progress report.
  - Eg. Think of how parents give their kids a “time-out” (to take away time from a fun activity with the hope that it will stop the unwanted behavior in the future.)



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ACTIVITY 2

1. For each of the following state whether it is an example of *positive reinforcement, negative reinforcement, positive punishment or negative punishment.*

    a) Jamie spanks his child for playing in the street.

    b) Receiving an “A” on exam that you studied real hard for.

    c) Brie cleans her room to keep her parents off her back.

    d) Receiving a hug from your parents after throwing a temper tantrum.

    e) Using a condom to reduce the risk of STDs.

    f) After Cassie flirted with someone else at the party, her boyfriend stopped talking to her. Cassie didn’t flirt at the next party.

    g) The annoying student jumps up and down, hand raised, yelling “me, me, me!” until the teacher calls on her. The child jumps and yells even more in the future.

Schedules

Continuous reinforcement is a reinforcement schedule under which all correct responses are reinforced. This is a useful tactic early in the learning process. It also helps when "shaping" new behaviour.

Shaping is a technique where new behaviour is produced by reinforcing responses that are similar to the desired response.

Intermittent reinforcement is a type of reinforcement schedule by which some, but not all, correct responses are reinforced. Intermittent reinforcement is the most effective way to maintain a desired behaviour that has already been learned. There are four types of intermittent reinforcement:

- **Fixed Interval Schedule (FI)** - that rewards a learner only for the first correct response after some defined period of time
- **Variable Interval Schedule (VI)** - that rewards a correct response after an unpredictable amount of time
- **Fixed Ratio Schedule (FR)** - that rewards a response only after a defined number of correct answers
- **Variable Ratio Schedule (VR)** - that rewards an unpredictable number of correct responses.

ACTIVITY 3

1. For each of the following state what type of schedule of reinforcement it demonstrates.
    a) You get paid once every two weeks.

    b) Slot machines at casinos payoff after a random number of plays.

    c) You get a nickel for every pop can that you return.

    d) Sometimes the mail is delivered at 1:00, sometimes at 3:00.

    e) A car salesman who gets a commission on each sale.

    f) Getting a small increase in your hourly wage every 6 months.

2. Complete the table below comparing and contrasting classical and operant conditioning.

	Classical Conditioning	Operant Conditioning
Behaviour controlled by		
Does it involve rewards and punishments		
Desired behaviour must be an innate reflex already present		
Type of behaviour produced		
Extinction created by		
Passive or active learner		

3. For each of the following state whether it is an example of classical or operant conditioning and explain why.

    a) A mother strokes her infant's skin, the stroking creates a pleasure response in the baby. As time goes by the baby begins to show pleasure responses simply at the sight of the mother without being touched.

    b) A very bright and mildly painful light is put on a rat. The rat has learned that he can turn off the light by pressing a level on the other side of the cage.

    c) Fred leaves his clothes and toys all over his room. It seems like the only time he cleans up his room is when his mother yells at him. When she yells at him Fred always picks up his clothes and toys.

    d) You have a friend who always keeps the temperature of her house on high so it is very warm. Every time you visit you find yourself perspiring. The last time you visited her, you noticed that you began to perspire before you even entered the house.

    e) Every time you walk into the outside your dog comes running up to you and grabs his food bowl in his mouth. He doesn't put the food bowl down into you feed him.

OBSERVATIONAL LEARNING

You can think of observational learning as an extension of operant conditioning, in which we observe someone else getting rewarded but act as though we had also received the reward. **Observational learning** is when new responses are acquired after others' behaviour and the consequences of their behaviour are observed.

Four stages of observational learning:

- **Attention** - observers cannot learn unless they pay attention to what's happening around them
- **Retention/Memory** - observers must not only recognize the observed behaviour but also remember it at some later time
- **Initiation/Motor** - observers must be physically and intellectually capable of producing the act
- **Motivation** - coaches also give pep talks, recognizing the importance of motivational processes to learning.

Bandura's Bobo doll study (1961) indicated that individuals (children) learn through imitating others who receive rewards and punishments. After observing adults seeming to enjoy punching, hitting and kicking an inflated doll called Bobo, the children later showed similar aggressive behaviour toward the doll. The control group in the study, who saw adults treat the doll nicely, also repeated the behaviour of nicely treating the doll.

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Implication of Observational Learning
Unfortunately, Bandura's studies show that antisocial models (family, neighborhood or TV) may have antisocial effects. Fortunately, prosocial (positive, helpful) models may have prosocial effects.

Does violence on TV/movies/video games have an impact on the learning of children? Correlation evidence from over 50 studies shows that observing violence is associated with violent behaviour. Gentile et al., (2004) shows that children in elementary school who are exposed to violent television, videos, and video games express increased aggression. In addition, experimental evidence shows that viewers of media violence show a reduction in emotional arousal and distress when they subsequently observe violent acts, a condition known as psychic numbing.

ACTIVITY 4

1. Complete the following.
    a) For an individual to experience observational learning he or she must –

    b) The model in observational learning is the person who is –

    c) Which of the following is the best example of observational learning?
        - A little girl is spanked for grabbing her sister's hair
        - Students in a class have to stay in at lunch for talking too much
        - Young women wear clothes styled by a popular actress
        - A piano student becomes proficient after many years of study

Answers to activities contained in this workbook

ACTIVITY 1

1. Complete the table below describing the five components of classical conditioning in Pavlov's experiment.

Component	Example in Pavlov's Experiment
Neural stimulus	Bell
Unconditioned stimulus	Food
Unconditioned response	Dog salivating
Conditioned stimulus	Bell
Conditioned response	Dog salivating

2. Complete the table below describing the five components of classical conditioning for the following example –

   Jamie got into the habit of yelling "bye Mum" and then slamming the door loudly when she left for school in the morning. The door slam caused her mother to flinch. After several days of this, Jamie's mother begins to flinch at the sound of the word "bye Mum" being yelled.

Component	Example in Scenario
Neural stimulus	Yelling "bye Mum"
Unconditioned stimulus	Door slam
Unconditioned response	Flinching
Conditioned stimulus	Yelling "bye Mum"
Conditioned response	Flinching

ACTIVITY 2

1. For each of the following state whether it is an example of *positive reinforcement, negative reinforcement, positive punishment or negative punishment*
    h) Jamie spanks his child for playing in the street.
    Positive Punishment
    i) Receiving an “A” on exam that you studied real hard for.
    Positive Reinforcement
    j) Brie cleans her room to keep her parents off her back.
    Negative Reinforcement
    k) Receiving a hug from your parents after throwing a temper tantrum.
    Positive Reinforcement
    l) Using a condom to reduce the risk of STDs.
    Negative Reinforcement
    m) After Cassie flirted with someone else at the party, her boyfriend stopped talking to her. Cassie didn’t flirt at the next party.
    Negative Punishment
    n) The annoying student jumps up and down, hand raised, yelling “me, me, me!” until the teacher calls on her. The child jumps and yells even more in the future.
    Positive Reinforcement

ACTIVITY 3

1. For each of the following state what type of schedule of reinforcement it demonstrates.
    g) You get paid once every two weeks.
    Fixed Interval
    h) Slot machines at casinos payoff after a random number of plays.
    Variable Ratio
    i) You get a nickel for every pop can that you return.
    Fixed Ratio
    j) Sometimes the mail is delivered at 1:00, sometimes at 3:00.
    Variable Interval
    k) A car salesman who gets a commission on each sale.
    Continuous Reinforcement
    l) Getting a small increase in your hourly wage every 6 months.
    Fixed Interval

2. Complete the table below comparing and contrasting classical and operant conditioning.

	Classical Conditioning	Operant Conditioning
Behaviour controlled by	Behaviour is controlled by the stimuli that ***precede*** the response (by the CS and the UCS).	Behaviour is controlled by consequences (rewards, punishments) that ***follow*** the response.
Does it involve rewards and punishments	No	Yes
Desired behaviour must be an innate reflex already present	Yes	No
Type of behaviour produced	Through conditioning, a new stimulus (CS) comes to produce the **old** (reflexive) behaviour.	Through conditioning, a new stimulus (reinforcer) produces a **new** behaviour.
Extinction created by	Extinction is produced by withholding the UCS.	Extinction is produced by withholding reinforcement.
Passive or active learner	Learner is passive (acts reflexively): Responses are involuntary. That is behaviour is ***elicited*** by stimulation.	Learner is active: Responses are voluntary. That is behaviour is ***emitted*** by the organism.

3. For each of the following state whether it is an example of classical or operant conditioning and explain why.

    f) A mother strokes her infant's skin, the stroking creates a pleasure response in the baby. As time goes by the baby begins to show pleasure responses simply at the sight of the mother without being touched.
    Classical – the baby's pleasure responses are involuntary reflexes not learned behaviour

    g) A very bright and mildly painful light is put on a rat. The rat has learned that he can turn off the light by pressing a level on the other side of the cage.
    Operant – the rat has learned to turn the light off in response to the brightness and pain (not a reflex action), example of negative reinforcement (action removes the light)

    h) Fred leaves his clothes and toys all over his room. It seems like the only time he cleans up his room is when his mother yells at him. When she yells at him Fred always picks up his clothes and toys.
    Operant – Fred has learned to pack up to stop his mother yelling

    i) You have a friend who always keeps the temperature of her house on high so it is very warm. Every time you visit you find yourself perspiring. The last time you visited her, you noticed that you began to perspire before you even entered the house.
    Classical – perspiration is a reflex not a learned behaviour

    j) Every time you walk into the outside your dog comes running up to you and grabs his food bowl in his mouth. He doesn't put the food bowl down into you feed him.
    Operant – the dog has learned the behaviour to get food and getting feed by the human has reinforced it.

ACTIVITY 4

1. Complete the following.

   d) For an individual to experience observational learning he or she must –
   Imitate the behaviour of others and be capable of repeating it

   e) The model in observational learning is the person who is –
   The person whose behaviour is being copied, that one imitated by the learner.

   f) Which of the following is the best example of observational learning?
   - A little girl is spanked for grabbing her sisters hair
   - Students in a class have to stay in at lunch for talking too much
   - Young women wear clothes styled by a popular actress
   - A piano student becomes proficient after many years of study

Year 12 SELF – Cognition

Theories of Learning

Textbook references, questions and additional resources

If you have access to *Nelson Psychology WA ATAR Unit 3&4*, complete the following reading and questions:

- read pages 30-34
- complete end of chapter questions on page 41 - Terminology 4-5 and MCQ 5-6 & 11-12.

If you have access to *Nelson Psychology WA ATAR Unit 3&4 Student Workbook*, complete the following reading and questions:

- pages 40-46.

Check out the additional reading in the following links to help you clarify your understanding.

- Pavlov's Original Experiment https://www.youtube.com/embed/hhqumfpxuzI
- Little Albert Experiment https://www.youtube.com/embed/9hBfnXACsOI
- Skinner – Operant Learning https://www.youtube.com/embed/I_ctJqjlrHA
- Difference between Operant and Classical Conditioning https://www.youtube.com/embed/H6LEcM0E0io
- Bandura's Bobo Doll study https://www.youtube.com/embed/dmBqwWIJg8U
- Bobo doll experiment https://www.psychotube.net/learning-psychology/albert-bandura-bobo-doll-experiment/
- Classical conditioning http://www.simplypsychology.org/classical-conditioning.html
- Skinner's operant conditioning http://www.simplypsychology.org/operant-conditioning.html
- Negative Reinforcement V Punishment https://www.youtube.com/watch?v=imkbuKomPXI&feature=youtu.be

Year 12 SELF – Cognition
Theories of Learning

EXAM PRACTICE QUESTIONS

Answer the following questions taken from ATAR Psychology 2016 exam paper

Source: School Curriculum and Standards Authority, Psychology 2016 ATAR Examination
https://senior-secondary.scsa.wa.edu.au/further-resources/past-atar-course-exams/psychology-past-atar-course-exams

Monica's cat comes running into the house as soon as Monica opens the refrigerator to prepare its food.

(b) (i) Name the type of learning that this involves. (1 mark)

_____

(ii) State **two** reasons for your answer to part (b)(i). (2 marks)

One: _____

_____

Two: _____

_____

(c) Define these terms in relation to learning theory.

(i) reinforcement (1 mark)

_____

_____

(ii) punishment (1 mark)

_____

_____

(e) Andrew also wants Jimmy to stop swearing. Give **one** example of how he might achieve this using

(i) positive reinforcement. (1 mark)

_____

(ii) negative reinforcement. (1 mark)

_____

Violet experienced severe nausea and vomiting from eating contaminated food from a market. The market was decorated with coloured lanterns. Violet now feels sick every time she sees coloured lanterns.

(f) (i) The process of learning in Violet's experience is shown below. The unconditioned response is nausea/vomiting. Identify the remaining variables. (4 marks)

Neutral stimulus	+	Unconditioned stimulus	⇨	Unconditioned response
_____		_____		Nausea/vomiting
_____		_____		

		Conditioned stimulus	⇨	Conditioned response
		_____		_____
		_____		_____

In Pavlov's original experiments, the conditioned response was produced after multiple pairings of the neutral stimulus and unconditioned stimulus. However, Violet learned the association with a single pairing.

(ii) Outline what learning theorists believe about why some associations are learned very quickly. (2 marks)

_____

_____

_____

_____

Answers and Marking Key

Marking key taken from ATAR Psychology 2016 ATAR Examination Marking Key

Source: School Curriculum and Standards Authority, Psychology 2016 ATAR Examination Marking Key
https://senior-secondary.scsa.wa.edu.au/further-resources/past-atar-course-exams/psychology-past-atar-course-exams

(b) (i) Name the type of learning that this involves. (1 mark)

Description	Marks
Operant conditioning	1
Total	**1**

(ii) State **two** reasons for your answer to part (b)(i). (2 marks)

Description	Marks
The cat running into the house is voluntary behaviour (rather than reflexive behaviour)	1
The cat has learned to run into the house when hearing the sound of the refrigerator opening because it has learned that this is followed by the reward of food	1
Total	**2**

(c) Define these terms in relation to learning theory.

(i) reinforcement (1 mark)

Description	Marks
a consequence that strengthens/increases likelihood of a behaviour **or** a process used to strengthen/increase a behaviour	1
Total	**1**

(ii) punishment (1 mark)

Description	Marks
a consequence that weakens/decreases likelihood of a behaviour **or** a process used to weaken/decrease a behaviour	1
Total	**1**

(d) Andrew wants his son Jimmy to clean up his room. Give **one** example of how he might achieve this using

(i) positive reinforcement. (1 mark)

Description	Marks
Response must be an example of the addition of a pleasant stimulus when Jimmy does the desired behaviour (cleans his room). Examples could include pocket money, praise, fun activity etc.	1
Total	**1**

(ii) negative reinforcement. (1 mark)

Description	Marks
Response must be an example of the removal of an unpleasant stimulus when Jimmy does the desired behaviour (cleans his room). Examples might include taking away another chore, stopping nagging him, take away an early bedtime etc.	1
Total	**1**

(e) Andrew also wants Jimmy to stop swearing. Give **one** example of how he might achieve this using

(i) positive reinforcement. (1 mark)

Description	Marks
Response must describe an example of adding a pleasant stimulus when Jimmy uses appropriate language (does not swear). Examples could include pocket money, another reward or treat etc.	1
Total	**1**

(ii) negative reinforcement. (1 mark)

Description	Marks
Response must be an example of removing an unpleasant stimulus when Jimmy uses appropriate language (does not swear). Examples could include exempting him from chores, stopping telling him off etc.	
Total	**1**