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Year 10 Psychology

Second Edition



CAMBRIDGE UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom
One Liberty Plaza, 20th Floor, New York, NY 10006, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi – 110025, India
103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

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First published 2022
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Cover and text designed by Shaun Jury
Typeset by QBS Learning
Printed in China by C&C Offset Printing Co. Ltd

A catalogue record for this book is available from the National Library of Australia at www.nla.gov.au

ISBN 978-1-108-86983-6 Paperback

Additional resources for this publication at www.cambridge.edu.au/GO

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ISBN 978-1-108-86983-6

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Thank you to my parents, and to Leighton and Max.

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Thank you to the great colleagues I've had the privilege to learn from and work with, and thank you to my supportive family.

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Special thanks to Meg for kick-starting this project, to Carly and to Linda for being such an ace team and to my family for giving me the space needed to focus on this project. And to all the psychology students out there – keep on loving the subject because we love teaching it.



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All resources: how to use this book

Elements in the print book

You will see the following types of boxes throughout this book.

Glossary Definitions of key terms are provided after that term first appears in the chapter.

Review

Review questions provide checks for students' understanding and ability to recall and apply key ideas from section content.

Activity

These are engaging questions that can be completed individually or as a class.

Did you know?

These are short facts that contain interesting information.

End-of-chapter test

End-of-chapter test questions provide a way to further check understanding of the chapter content as well as practise answering exam-style questions. These questions are split into multiple-choice, short-answer and extended-response style questions.

Icons in the textbook

Throughout the print textbook there are also several icons that link to videos and extra content in the Interactive Textbook.



VIDEO

These icons indicate that there is a video in the Interactive Textbook.



QUIZ

Automarked quizzes can be found in the Interactive Textbook for every section.



SCORCHER
Competitive questions can be found at the end of each chapter.



QR VIDEO
These icons indicate that there is a short video related to the content that can be accessed with a QR code scanner.

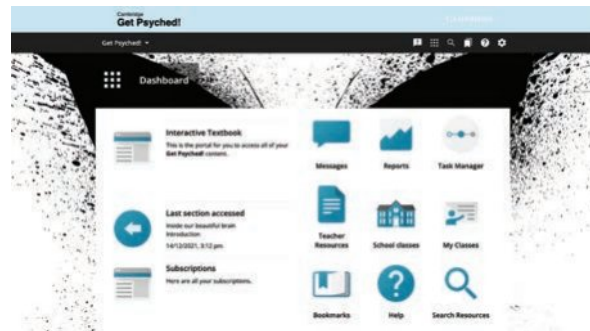


SUMMARY
Key points from the chapter can be found in the Interactive Textbook.

Overview of the Online Teaching Suite (OTS)

The Online Teaching Suite is automatically enabled with a teacher account and is integrated with the teacher's copy of the Interactive Textbook. All the assets and resources are in one place for easy access. The features include:

- **the Edjin learning management system** with class and student analytics, reports and communication tools
- teacher's view of a **student's working and self-assessment**
- **suggested responses** to all questions in the textbook
- editable **course outline**.



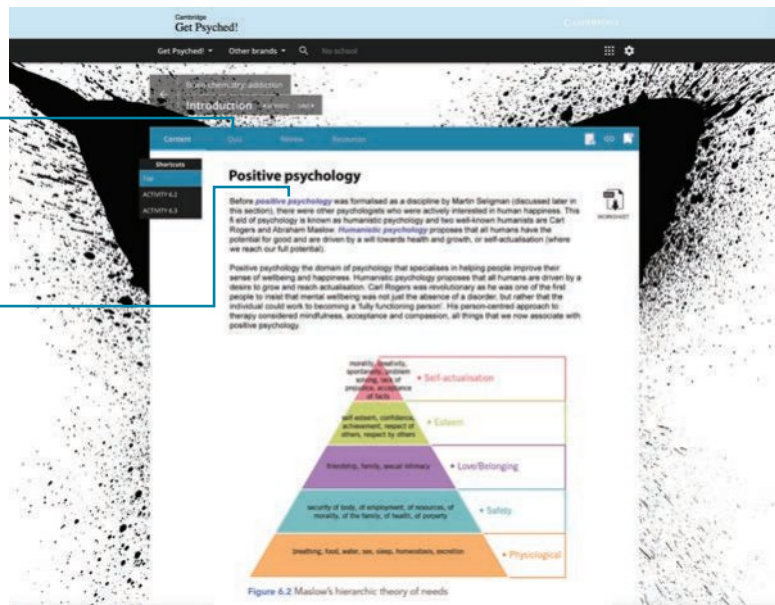
Overview of the Interactive Textbook (ITB)

The **Interactive Textbook (ITB)** is an online HTML version of the print textbook powered by the Edjin Platform. It is included with the print textbook or available as a separate digital-only product.

Quizzes contain automarked questions that enable students to quickly check their understanding.

Definitions pop up for key terms in the text.

Videos summarise, clarify or extend student knowledge.

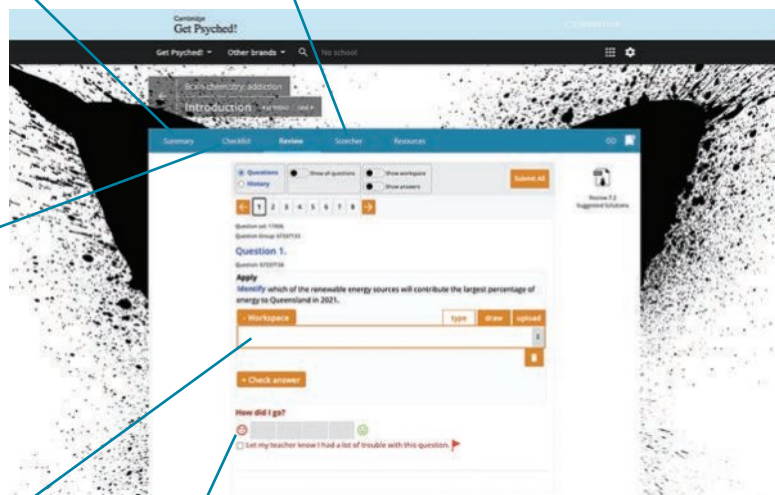


Summaries for each chapter are provided in the ITB to help with study and revision.

Scorchers are a series of rapid-fire style questions at the end of each chapter that test students' abilities to recall facts from the content.

Checklists contain questions that have been linked through a checklist to specific sections of a chapter. This helps to identify parts of the book that may need more clarification and revision. Checklists are available in the ITB and as a downloadable word document.

Workspaces enable students to enter working and answers online and to save them. Input is by typing, handwriting and drawing, or by uploading images of writing or drawing.



Self-assessment tools enable students to check answers, mark their own work and rate their confidence level in their work. This helps develop responsibility for learning and communicates progress and performance to the teacher. Student accounts can be linked to the learning management system used by the teacher in the Online Teaching Suite.



Chapter 1

Inside our beautiful brain

‘We are what we think. All that we are arises with our thoughts. With our thoughts, we make the world.’

— Buddha

The brain is one of the most researched parts of the human body, and although there is so much we now know and understand about the brain, there is still much more to explore. Researchers are continuing to make exciting discoveries about how the brain works. This chapter shares how the brain ‘talks’ to the body through specialised cells called **neurons**, and how wonderful and fundamental these microscopic cells are.

Neuron the fundamental building block of the brain and nervous system, a cell responsible for relaying information throughout the body in the form of electrochemical signals.

1.1

How our brain talks

The neuron is the basic building block of the amazing nervous system. It is a key cell for communication. There are trillions of neurons in each human body. It is estimated that the brain on its own has 86 billion neurons! Neurons enable the body to talk to the brain and vice versa. Each neuron is capable of making thousands of connections with other neurons. The stronger the connections between neurons, the faster we are able to access our knowledge. In this way, the brain is like an online search engine.

Let's consider each part of the neuron. Every neuron inside the brain has distinct parts. The first part of a neuron is a set of branch-like extensions called **dendrites**, which receive messages from neighbouring neurons. Specifically, dendrites are covered in receptor sites that receive **neurotransmitters** (chemical messengers) released from other neighbouring neurons. This is how neurons 'talk'. A neurotransmitter can be either an **excitatory** or an **inhibitory** neurotransmitter. If the neurotransmitter is excitatory, it would tell the neuron to become more active (or to start

firing). If the neurotransmitter is inhibitory, it would tell the neuron to calm down or decrease its activity (reducing firing). The dendrites, therefore, carry these important messages from the neurotransmitters through to the **soma** (or cell body).

Dendrites branch-like extensions at the front end of a neuron that receive neurotransmitters from other neurons.

Neurotransmitters chemical messengers released by the axon that travel across the synapse (a gap) to the dendrites of neighbouring neurons.

Excitatory a type of neurotransmitter that increases the overall activity of a neuron, making it more likely to fire.

Inhibitory a type of neurotransmitter that decreases the overall activity of the neuron, making it less likely to fire.

Soma the cell body and control centre of a neuron, containing its nucleus and DNA.

Did you know?

Each neuron is capable of making 10 000 connections with other neurons, meaning that each single person could have up to 30 quadrillion connections in their brain!

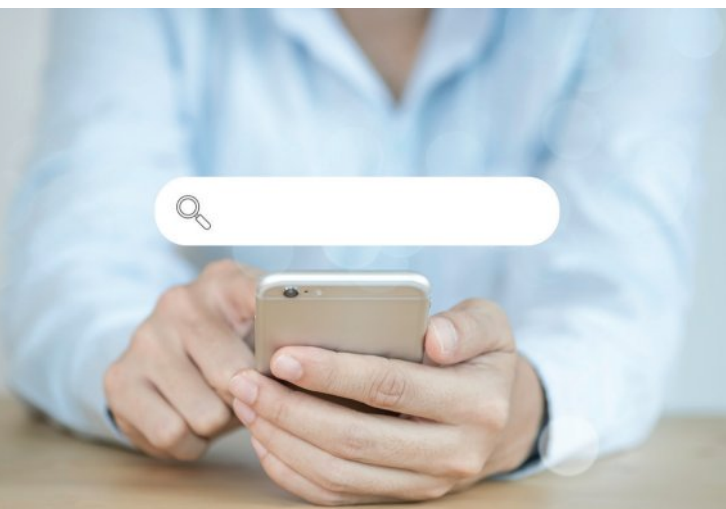


Figure 1.1 The brain is like an online search engine – the pages with more traffic are shown first.

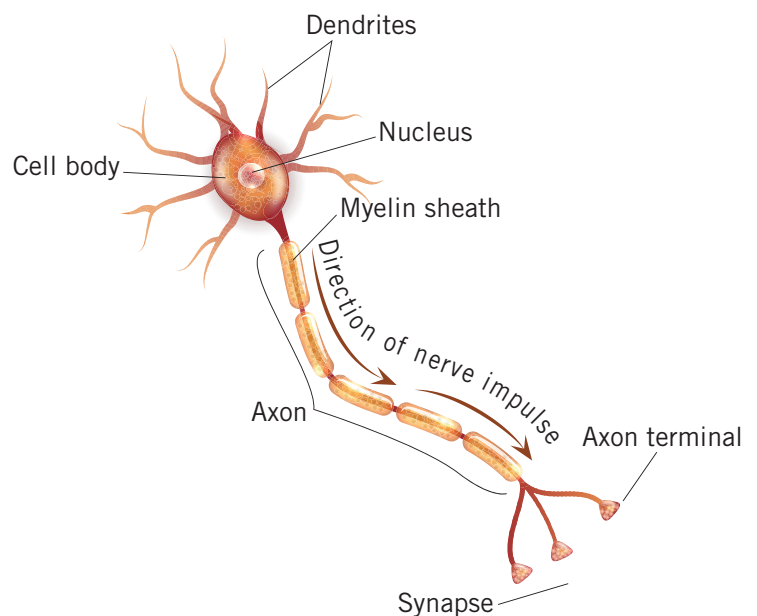


Figure 1.2 A neuron and its parts

The soma, which is the control centre of the neuron, contains the nucleus of the neuron. The nucleus houses **DNA**, which is responsible for looking after the health of the neuron through, for example, protein synthesis. A message then is sent from the soma along to the **axon**, which is a cable-like extension that runs from the soma to the end of the neuron. An axon is covered by an outer lining called a **myelin sheath**, which is fatty tissue that insulates the axon. The more myelinated an axon is, the faster the message is transmitted along the neuron.

DNA a molecule present in nearly all living things that carries the genetic information responsible for cell development and function.

Axon a cable-like extension from the cell body of a neuron that sends messages to other neurons.

Myelin sheath fatty, white insulating tissue that surrounds the axons of neurons.

The message that is carried along a neuron has a special term: a **neural impulse**. These neural impulses in the brain are electrochemical, meaning they are both electrical and chemical in nature. Axons carry neural impulses very quickly – usually around 70 to 120 metres per second!

Neural impulses the messages that travel along a neuron that are both electrical and chemical in nature.

Once the message reaches the end of the axon, it hits a dead end. At the end of the axon are **axon terminals**, which have a very special role in the neuron. They release the neurotransmitters that ‘talk’ to the dendrites of the next neighbouring neuron. And so the message continues on and on.

Axon terminals branch-like extensions of the axon at the end of a neuron that release neurotransmitters across the synapse to be received by other neurons.

Neurons do not touch each other, which is why neurotransmitters are so important. There is a small gap called a **synapse** between each neuron. The message needs to travel from the end of the axon across the gap to the next neuron’s dendrites. There are about 1000 neurotransmitters in the human body and each has a different role. We will look at a few key neurotransmitters later in this chapter.

Synapse a small gap between neurons.

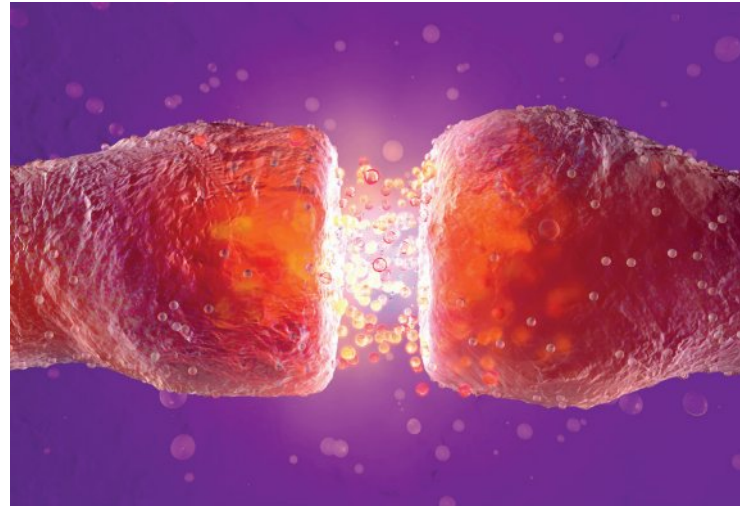


Figure 1.3 Neurotransmitters are released by the axon terminal of one neuron and received by the dendrite of a neighbouring neuron.

Did you know?

Neural impulse speeds vary depending on the neuron it is traveling through. It can range from less than 1 metre per second up to more than 100 metres per second.

Activity 1.1

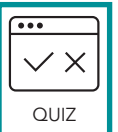
Neurons

- 1 In your workbook, draw a diagram of a neuron and label its features.
- 2 Under your diagram of the neuron, describe the role of each labelled feature. You could do this as a list, for example.

Review 1.1

How our brain talks

- 1 A neural impulse is electrochemical. Explain what this means.
- 2 Define what a neurotransmitter is and identify which parts of the neuron interact with neurotransmitters.
- 3 There are two types of neurotransmitters. Identify them and explain what they do.



1.2 Damage to neurons

Researchers have learned a lot about neurons through scientific studies, and also from observation when neurons become damaged or die. Damage to neurons can be due to biological conditions, such as **multiple sclerosis (MS)** and **acquired brain injury**.

Multiple sclerosis (MS) one of the most commonly occurring neurological diseases in the world, which causes the immune system to mistakenly attack the myelin sheath, producing scarring of the axon.

Acquired brain injury damage to the brain resulting from an accident or blow to the head.

Multiple sclerosis

Multiple sclerosis is the most common **neurological disease** affecting young adults. In Australia, nearly 25 000 Australians have been diagnosed with the disease with almost 75 per cent of them being female. Diagnosis tends to occur between the ages of 20 and 40 years.

Neurological disease any disorder that affects the brain as well as the nerves found throughout the human body.

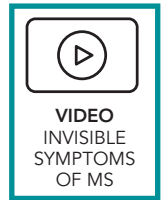
Multiple sclerosis attacks the myelin sheath surrounding the axons of neurons. It is thought that the immune system mistakenly attacks the myelin sheath, with patches of the axon becoming scarred and exposed. In fact, 'sclerosis' in Greek means scars. Essentially, the breakdown of myelin causes communication issues and, consequently, the brain and body are not able to 'talk' as effectively.

Myelin can eventually grow back. This means that a person with MS can have periods of recovery before the next 'attack'. Unfortunately, at times, people with MS may not make a full recovery or their symptoms can worsen as the disease progresses. Despite there being no cure, people with MS tend to live almost a normal lifespan by managing their disease with medication and treatments.

Symptoms of MS include:

- loss of motor function (such as hand or arm not working properly)
- coordination issues

- speech problems
- extreme fatigue
- vision problems
- tremors
- discomfort/pain
- changing to thinking and memory
- loss of sensation or tingling in skin.



Causes

Multiple sclerosis is **idiopathic**, which means that it is not really known what causes it. There are risk factors that may increase a person's likelihood of developing the disease. Risk factors can include genetics, having had a previous viral infection and living further away from the equator.

Idiopathic any disease that is of uncertain or unknown origin.



Figure 1.4 Exercise can be a useful tool to manage the symptoms of multiple sclerosis.

Acquired brain injury

Acquired brain injury, or trauma, occurs when a person sustains damage to their brain due to an accident or blow to the head. For example, a person may acquire a brain injury following a car accident.

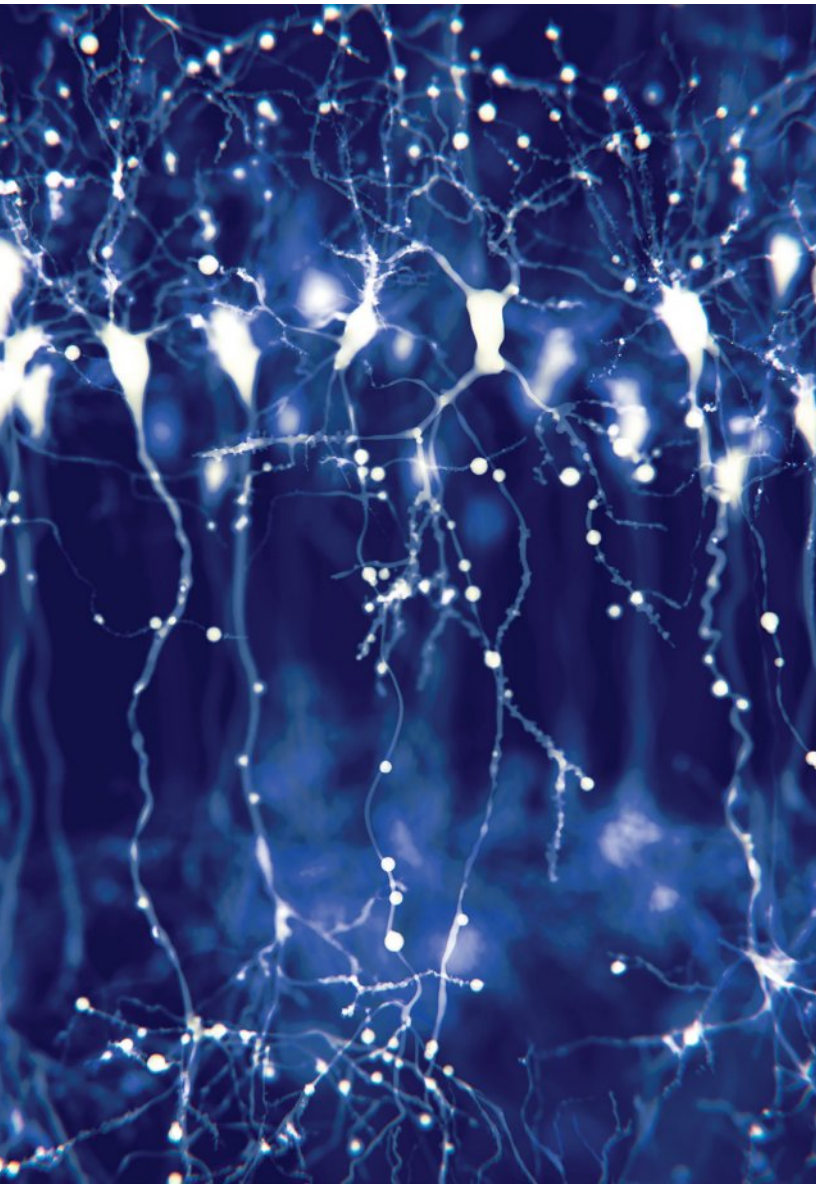


Figure 1.5 The axons of neurons are thin and fragile, making them vulnerable to breaking when the head and brain sustain a blow or heavy force, as can be the case with acquired brain injury.

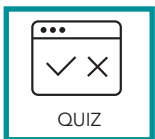
When the brain (and body) is jolted by force, the long axons of a neuron are vulnerable to damage. Axons are thin and fragile, and when placed under a lot of pressure they either break or rapidly weaken. A neuron with a severed axon quickly loses its connections to other neurons.

Following this, something quite amazing occurs. The wounded neuron's axon tries to seek out connections with other neurons. It becomes more 'excitable.' This is part of what is called **brain plasticity**, where the brain tries to overcome damage. This excitability can be very helpful in terms of recovery from a brain injury. But the excitability can also cause a great deal of pain for the person, as well as muscle spasms and agitation. It is not unusual for doctors to treat brain injuries with sedatives immediately after the accident to slow down the excitability for the benefit of the person and to keep them comfortable.

Brain plasticity a brain's ability to recover from damage.

The future of brain research

Swedish researchers built the world's first artificial neuron in 2015. These artificial neurons are the size of a fingertip (so quite a bit bigger than our naturally occurring neurons, which we are not able to see) and are able to mimic the main functions of a neuron, such as communicating with other cells. This research has profound implications for the treatment of neurological diseases and brain damage, as well as the heightening and strengthening of the brain's capabilities, such as increasing memory storage.



Review 1.2

Damage to neurons

- 1 Describe how MS damages the neuron, and what the resulting impact of this damage is.
- 2 Identify some symptoms of MS.
- 3 Define 'idiopathic'.
- 4 Describe some risk factors for MS.
- 5 Explain what is meant by acquired brain injury.
- 6 Explain how an acquired brain injury impacts the neuron and describe what further effect this might have on neural communication.
- 7 Describe how a neuron becomes more excitable following injury.
- 8 Describe what role artificial neurons could have in the future.

1.3

How our brain grows

The brain is an amazing organ. In addition to having plasticity, and trying to recover from damage, the brain can also grow.

Stimulating the brain causes it to grow. When we learn, our brain's neurons make more connections. They do this by growing more dendrites, which means we can receive more messages from axons of other neurons via the neurotransmitters. The growth of dendrites is called **sprouting**. For example, if a neuron only had one dendrite, it would only be able to communicate with one axon of another neuron. But if it has five dendrites, it can talk to five other neurons, and so on. Stimulated neurons develop 25 per cent more dendrites and increase in size, blood supply and number of connections.

Sprouting growth of dendrites during learning.

When we are children, the number of connections between our neurons is 50 per cent greater than when we are adults. During adolescence there is a massive **pruning** of these connections as neurons

die. It is a case of 'use it or lose it' – the neurons that die are the ones we didn't end up using. Theoretically, we could keep all the neurons we had at birth if we used them all.

Pruning death of synapses due to disuse of neurons.

By the age of six years, a child's brain is 95 per cent of the adult brain weight. The brain continues to grow and break neural connections, with a peak in **grey matter** just before puberty. Grey matter is all the cell bodies of neurons. The major processes, such as thinking, occur in the grey matter. The outer layer, or cortex, of the brain is grey matter. The **cortex** of a girl is at its thickest when she is 11 years old, and for boys it is thickest at 13 years old. This might explain why girls are often perceived as maturing faster than boys.

Grey matter cell bodies (soma) of neurons.

Cortex outer layer of the brain made up of grey matter where many processes take place, such as thinking.



Did you know?

Humans have one brain – but some animals have more. Indeed, leeches have 32 brains. A leech's nervous system is divided into 32 separate segments, and each of these segments has its own brain!

White matter, in comparison, contains the axons of neurons. Axons are surrounded by the fatty, white myelin sheath – hence the name 'white matter'. White matter and grey matter are equally important. White matter is needed to insulate and speed up the transmission of the electrochemical impulses in the brain. Therefore, grey matter would be powerless without white matter to transmit messages. Current and ongoing research suggests that there is a link between the amount of white matter and intelligence.

White matter axons of neurons insulated by the fatty white myelin sheath.

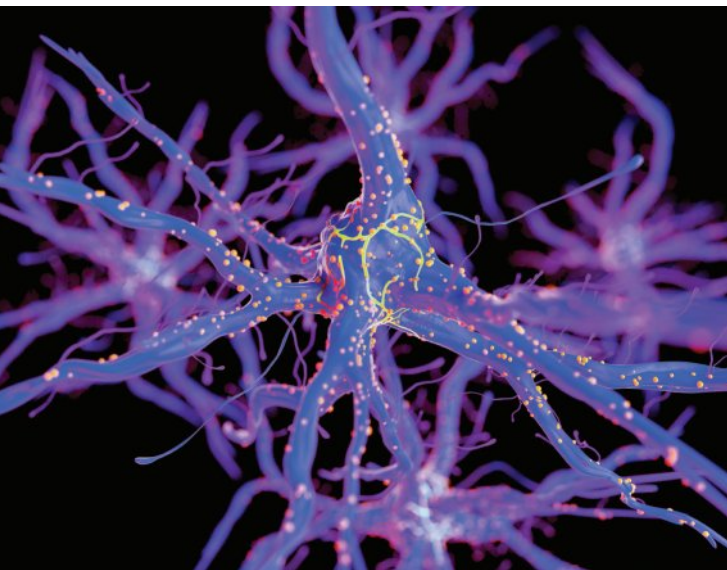


Figure 1.6 The growth of dendrites is known as sprouting, enabling a neuron to communicate with more neurons.

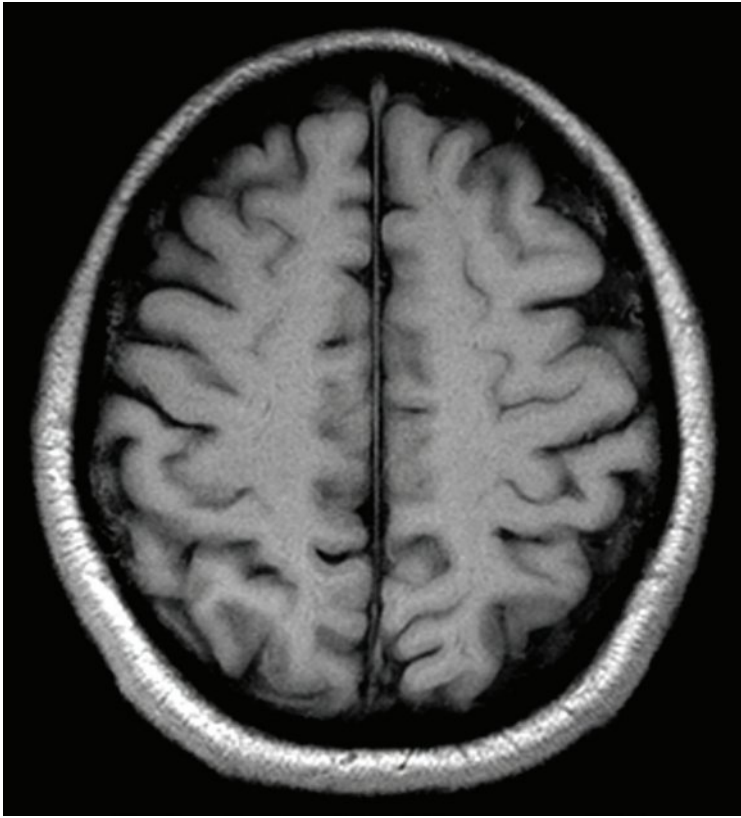


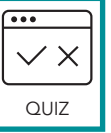
Figure 1.7 This MRI scan shows the grey matter on the outer edges, and the white matter in the middle areas, of the brain.

The peak of development of the brain is thought to be at about 22 years of age and lasts for about five years. The decline after this is very slow. However, staying physically and mentally active, and maintaining a good diet, can slow down the decline significantly.

Review 1.3

How our brain grows

- 1 Compare and contrast sprouting and pruning in terms of neural connections, describing what happens in both processes.
- 2 In terms of connections between neurons, deduce one effect of growing older.
- 3 Define the terms 'grey matter' and 'white matter'.
- 4 Explain the importance of both grey matter and white matter, and how the amount changes as our brains age from when we are children.
- 5 Recall when the brain supposedly peaks and identify some ways you can look after your brain.



1.4 Neurotransmitters

There are about 1000 neurotransmitters in the nervous system and each has a different role and varying influence on the brain and body.

Originally, researchers thought that neurons produced only one type of neurotransmitter each. However, we now know that some neurons can produce and release two or more different neurotransmitters. For example, nearly half of all the neurons in the brain can release glutamate.

Glutamate

Glutamate plays a role in memory and learning and is the most common type of neurotransmitter in the **central nervous system**.

Glutamate is an excitatory neurotransmitter, which, as explained earlier in the chapter, increases the activity of a neuron when it is received. People with lower levels of glutamate tend to have problems with their memory and learning. We might be tempted to prefer to have a high level of glutamate in our system. It is important, however, to have everything in moderation. Too much glutamate can be toxic because the nervous system can be overstimulated (too much activity) and thus wear out.

Glutamate the most common excitatory neurotransmitter that plays a large role in memory and learning.

Central nervous system a subdivision of the human nervous system that contains the brain and spinal cord.

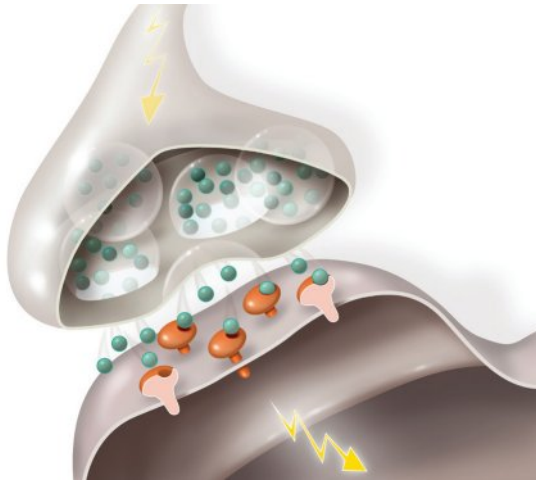


Figure 1.8 Glutamate is the most common excitatory neurotransmitter. Here an axon terminal (white) releases the glutamate (green) across the synapse, which then is received by the receptor sites (orange) on the neighbouring neuron's dendrite (grey). The neuron is then activated.

Aspartate

The next most common excitatory neurotransmitter in the nervous system is **aspartate**. In fact, there is a lot of scientific evidence that even low levels of both aspartate and glutamate are capable of exciting *every neuron* in the central nervous system. So, aspartate, like glutamate, is an essential neurotransmitter. It is responsible for helping to keep the mind sharp and focused. It also helps promote the metabolism, as well as assisting the transportation of essential minerals to the cells. Unsurprisingly, then, aspartate can be used to help treat depression and chronic fatigue. Aspartate is produced by the body, but we can also obtain extra doses of aspartate through consuming dairy, beef, poultry and sugar cane. People suffering from eating disorders or malnutrition can experience deficiencies in aspartate, leading to fatigue and a lack of concentration.

Aspartate the second most common form of excitatory neurotransmitter that plays an important role in focus, concentration, metabolism and general health of cells.

Acetylcholine

Another common excitatory neurotransmitter in the nervous system is **acetylcholine**. Acetylcholine was the first neurotransmitter to be discovered. In 1936, researchers Henry Hallet Dale and

Otto Loewi were both awarded the Nobel Prize in Physiology/Medicine for their discovery.

Acetylcholine an excitatory neurotransmitter that causes muscles to contract and plays a role in attention, memory and learning.

Acetylcholine has many impacts on the body. It causes muscles to contract. For this reason, acetylcholine is produced and released by many **motor neurons**. Acetylcholine is also essential for clear thinking and is thought to play a role in attention, learning and memory. Low levels of acetylcholine have been linked to Alzheimer's disease, which is a neurodegenerative disease and a form of dementia.

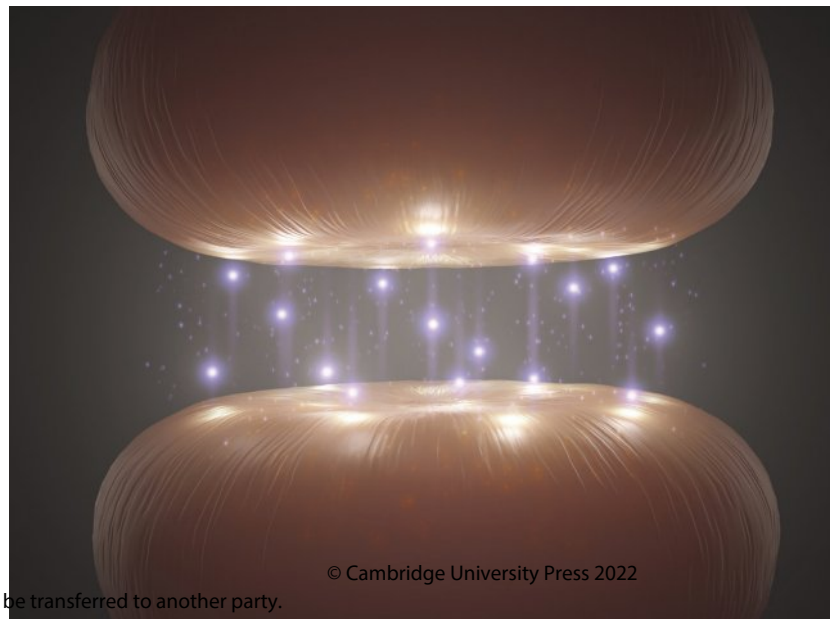
Motor neuron a special type of neuron that carries messages out from the brain and through the body. Motor neurons carry messages for involuntary and voluntary motor movement.

Gamma-aminobutyric acid (GABA)

GABA is the main inhibitory neurotransmitter in the nervous system. It is an important neural partner to glutamate. We need GABA because it reduces the activity of the nervous system. That is, it reduces or decreases the activity of neurons and thereby calms the nervous system down. People with naturally lower levels of GABA tend to experience stress more intensely or for longer periods of time, leading to a larger risk of developing anxiety disorders.

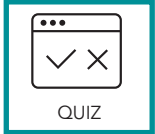
GABA the most common inhibitory neurotransmitter that plays a large role in calming or quieting the nervous system.

Figure 1.9 GABA is an inhibitory neurotransmitter that reduces the activity of the neurons and calms down the nervous system.



There are some very special neurotransmitters that can be produced in the brain as well as in the body. They are able to act as *both* neurotransmitters and hormones. They are called **neurohormones**.

Neurohormone a chemical substance that is able to act as both a neurotransmitter in the synapse and a hormone in the bloodstream.



Review 1.4

Neurotransmitters

- 1 Glutamate is an essential neurotransmitter. Identify why a balanced amount of it in the nervous system is important.
- 2 What diseases or conditions can low levels of aspartate and low levels of acetylcholine be linked to?
- 3 Why is GABA considered an important neural partner to glutamate?

Activity 1.2

Neurotransmitters

For each of the four neurotransmitters studied:

- 1 identify whether it is excitatory or inhibitory
- 2 describe its impact or role in the nervous system.

a Glutamate	c Acetylcholine
b Aspartate	d GABA

1.5 Neurohormones

To understand what neurohormones are, we need to first revise our understanding of hormones. Hormones are chemical substances produced and released by glands in the body. They travel through the bloodstream to target areas in the body. For example, the pancreas produces the hormone insulin and the gonads produce testosterone.

What is the difference between hormones and neurotransmitters?

Hormones typically influence target cells, and they can travel quite some distance in the bloodstream. However, neurotransmitters do not travel through the bloodstream. Instead, they travel over a minuscule distance between neurons. This gap between neurons is known as the *synaptic cleft*, more commonly called the synapse. We learned about the synapse earlier in this chapter. The size or distance of the synaptic cleft is thought to be less than one micrometre.

In fact, many neurotransmitters can only travel 0.001 of a micrometre, and hence they would only act on the nearest neurons located closest to them.

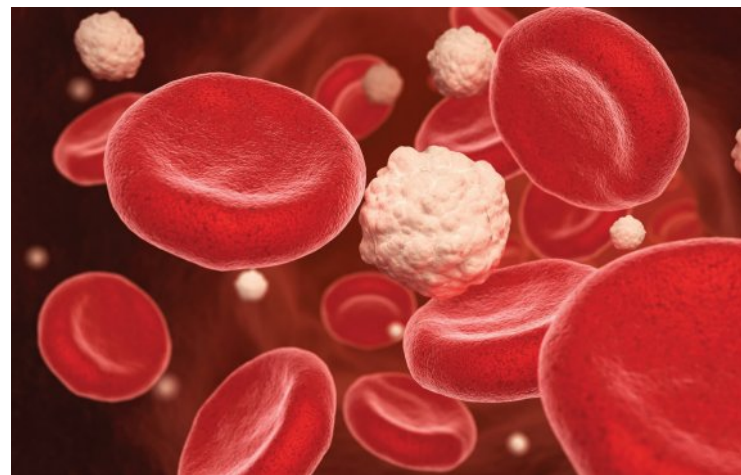


Figure 1.10 Neurohormones are special in that they can act as neurotransmitters in the synapse, but they can also be released by glands as hormones into the bloodstream. Therefore, we can call them neurohormones.

Some of the neurotransmitters that are able to act as both neurotransmitters and hormones are described below.

Serotonin

Serotonin is a very special chemical messenger in the nervous system because it is produced in the brain by specialised serotonin neurons. It is also produced in the intestines, so some people refer to it as either a neurotransmitter or a hormone. For this reason, serotonin can be called a *neurohormone*.

Serotonin a 'feel good' neurohormone that regulates mood, wellbeing, the digestive system and sleep.

Serotonin is a very important neurohormone. It is not able to pass from the blood to the brain, so serotonin only has an impact in the brain if it is produced by neurons, and can only have an impact in the body if it is produced by the intestines.

In the brain, serotonin regulates mood and our sense of wellbeing. We feel good when it is released, and it is linked to high mood and happiness. Interestingly, some drugs impact the release of serotonin, and we will look at these in the next chapter. Serotonin is also important for sleep, with high levels in the body working with **melatonin** (another special hormone that we will talk about in Chapter 5). Low levels of melatonin in the brain have been linked to depression and difficulty sleeping.

Melatonin a special sleep hormone that is released at night to help us feel sleepy. Its levels drop in the morning to help us feel more alert.

When secreted by intestines into the body, serotonin regulates bowel movement. If we eat something irritating or toxic, serotonin helps us get rid of what we have eaten by causing diarrhoea or nausea.

Endorphins

Endorphins are neurohormones produced by the pituitary gland in the brain and can also be produced in other parts of the body. Like serotonin, endorphins cannot cross the blood-brain barrier and so they need to be

released directly into the synapse to affect neurons, or into the bloodstream to impact upon the body. Endorphins are natural painkillers that are released when we experience pain or stress. For example, they are often released after strenuous exercise or when we eat really spicy foods. A common type of endorphin is **enkephalin**, which is our natural version of an opiate. Enkephalin is thought to be more powerful than morphine, which is one of the strongest human-made painkillers.

Endorphin a neurohormone that acts as a natural painkiller in times of pain or stress. Endorphins can also cause people to feel better after strenuous exercise (a runner's 'high').

Enkephalin a type of endorphin and a powerful opiate/painkiller created naturally by the human nervous system.

Dopamine

The most prominent neurohormone in the nervous system is **dopamine**. It is often referred to as the 'reward' hormone, because when we do something that feels good, dopamine is released to help us remember what it was that created the positive feeling. Dopamine is produced by many areas of the brain, particularly by specialised dopamine neurons in the substantia nigra – an area in the centre of the brain. Dopamine is also produced by other parts of the brain to act as a neurohormone. Unsurprisingly, dopamine plays a crucial role in memory and learning. It is also essential for smooth motor movements and coordination, with low levels of dopamine being linked to Parkinson's disease.

Dopamine a neurohormone that plays a role in memory, learning, motor movements, motivation and addiction.

Dopamine motivates us. As dopamine helps us remember what made us feel good, we tend to repeat those behaviours. For this reason, dopamine can play a role in addiction. Addiction and dopamine are studied more closely in Chapter 2.

Did you know?

You can intentionally manipulate the release of dopamine into your brain by thinking of something funny or cute!

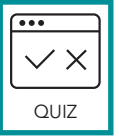
Activity 1.3**Neurohormones**

For each of the three neurohormones studied:

- 1 identify where it is released
- 2 describe its impact or role in the nervous system(s).
 - a Serotonin
 - b Endorphins
 - c Dopamine

Review 1.5**Neurohormones**

- 1 Describe how neurohormones differ from neurotransmitters.
- 2 Discuss where serotonin can be released to impact the brain and body.
- 3 Why is dopamine referred to as a reward hormone?

**1.6****End-of-chapter test****Multiple-choice questions**

- 1 What is the role of dendrites on a neuron?
 - A To send messages to neighbouring neurons
 - B To protect the neuron from disease
 - C To receive messages from neighbouring neurons
 - D To feed the neuron
- 2 When we learn, our:
 - A Brain becomes less dense
 - B Neurons make more connections
 - C Neurons shrink
 - D Brain plays tricks on us
- 3 Which of the following is *not true* for multiple sclerosis (MS)?
 - A MS is due to the breakdown of the myelin sheath.
 - B People with MS tend to have an immune system that attacks the neurons.
 - C Only women get MS.
 - D People can have periods of recovery (or remission) from MS.
- 4 Which of the following statements is *not true*?
 - A Neurohormones travel across the synapse whereas neurotransmitters travel in the bloodstream.
 - B Neurohormones can travel through the bloodstream whereas neurotransmitters travel across the synapse.
 - C Neurohormones work on target cells whereas neurotransmitters are received by receptor sites on dendrites.
 - D Neurohormones travel a much longer distance than neurotransmitters.
- 5 Serotonin is special because it:
 - A Is only made by neurons
 - B Is made by neurons as well as the intestine
 - C Is only called a hormone
 - D Is only called a neurotransmitter

Short-answer questions

- 1 Sarah has suffered a physical blow to the side of her head and is having problems thinking clearly.
 - a Explain why this may be so. You should refer to the damage Sarah may have acquired to her brain.
 - b Sarah feels worried, but her doctor assures her that she will recover some of her lost function. Explain why the doctor might believe this to be the case.
- 2 Your friend, Anwar, has been reading about neurotransmitters. He tells you he wishes he had more glutamate and less GABA. You disagree with him. Describe some of the things you could teach Anwar about these two neurotransmitters to help him understand why both neurotransmitters are equally important.
- 3 Describe how neurohormones are different from neurotransmitters. Then compare and contrast the two groups of chemical messengers using examples from the textbook.

Extended-response question

Caleb is playing footy when he is tackled to the ground and his head collides with one of the goal posts. Caleb is taken to the hospital where he is informed by a doctor that he has acquired a minor brain injury and needs rest from school for a few weeks to recover. A month later, Caleb returns to school and is happy to be back in class, particularly in history where he is learning about World War II. Caleb is pleased to find that as the days pass, he is able to remember what he has learned in the classroom and that it appears he has recovered from his brain injury.

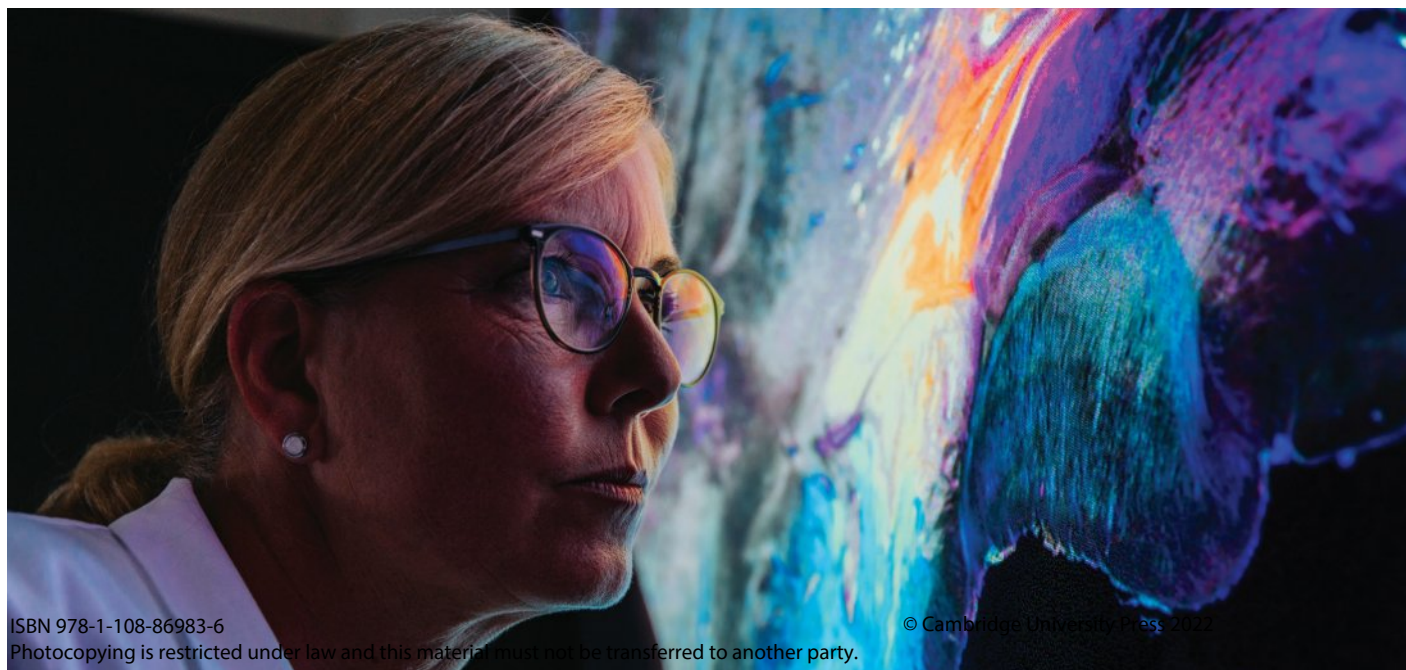
Using your knowledge of the brain, neurotransmitters and/or neurohormones, discuss Caleb's experiences from the moment of his injury right through to his return to school.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.

Figure 1.11 There is still so much to understand about how the brain works, but new and exciting possibilities are being explored all the time.



Chapter 2

Brain chemistry: addiction

‘The unfortunate thing about this world is that good habits are so much easier to give up than bad ones.’

— Somerset Maugham

Addiction is the physical and psychological inability to stop consuming a substance or repeating an activity even though it is causing physical and psychological harm. People often refer to addiction as an issue with the brain. The condition, however, occurs at a much deeper level. Addiction is a neural condition whereby neurons become hardwired to repeat behaviours – whether they are compulsions or the persistent use of a substance. Addiction has a negative impact on people’s lives. Addictive disorders, such as substance abuse (e.g. alcoholism) and behavioural addictions (e.g. gambling addiction), are classified as mental illnesses in the **DSM-V**. We will talk about other mental illnesses, particularly those that impact teenagers the most, in Chapter 3.

Addiction the physical and psychological inability to stop consuming a substance or carrying out an activity even though it is causing physical and psychological harm.

DSM-V *Diagnostic and Statistical Manual of Mental Disorders* (5th edition) is a diagnostic tool published by the American Psychiatric Association and widely used and accepted by clinicians around the world. Only qualified professionals can use the DSM-V.

In this chapter, we consider how addiction occurs. We look at what happens when the neuron becomes ‘addicted’ to a substance and/or a behaviour. In particular, drugs and gambling are the key areas of discussion.

2.1 The addicted neuron

In the previous chapter, we investigated the structure and functions of the neuron, as well as specific neurotransmitters and neurohormones. To understand how addiction can occur, we need to look at how memory and learning occurs. Why? Because addictions are *learned*.

How we learn and remember

When we learn something, a memory is formed. At a neural level, dendrites sprout on neurons and synaptic connections increase with the growth of the axon terminals. The neurotransmitter glutamate is released and its levels *increase* during learning, so the changes at the synapse become longer-lasting and more permanent. In addition to this, the neurohormone dopamine is released.

When we learn something that *makes us feel good* it is usually because serotonin and other neurohormones, such as endorphins, have also been released. Serotonin lifts our mood and makes us feel happier. Endorphins are natural painkillers and can also make us feel good. Endorphins tend to be released during aerobic exercise but can also be released when we laugh. Consequently, endorphins and serotonin can be present in the body system alongside dopamine and glutamate. Therefore, both dopamine and glutamate help form *a memory of the behaviour that just made us feel good*. This means that the next time we want to feel good, or the next time the opportunity comes up to repeat that behaviour, we are more likely to act it out. This is how addiction can begin for people who may be at risk.

Most times, the process of learning and remembering what makes us feel good is actually helpful for our survival or success; for example, this process also occurs when we eat, create an amazing piece of music or artwork, receive good study results or get a promotion in our job.

Nonetheless, if a behaviour has the potential to cause harm, the memory and learning of the behaviour can become problematic and harmful.

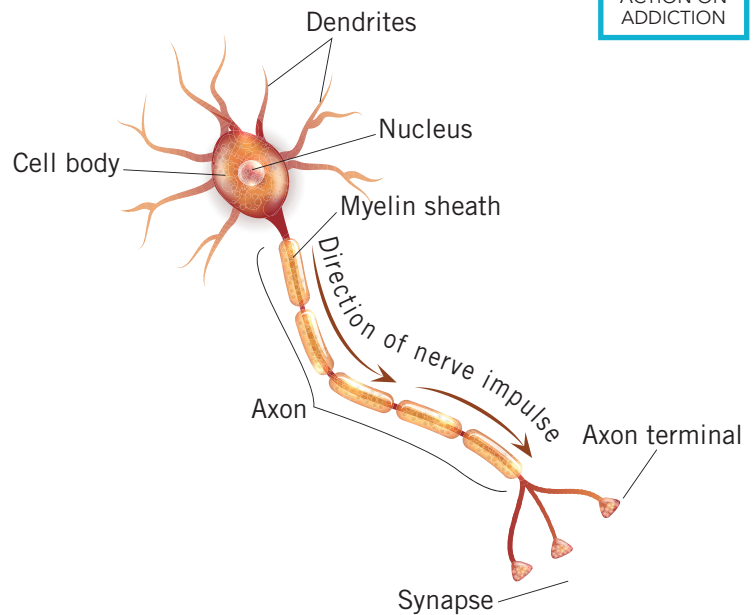
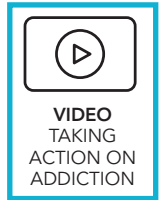


Figure 2.1 When a memory is formed in the brain, the axon terminals of the neurons grow, which, together with the neurons sprouting dendrites, increases the number of synaptic connections.



Figure 2.2 When we do something that makes us feel good, such as eating, neurotransmitters such as serotonin, dopamine and glutamate are released. A memory is formed of what makes us feel good and this means we are more likely to eat that food again.

This is particularly the case when the behaviour – such as taking drugs or having a bet – becomes a habit. When that occurs, the risks of addiction greatly increase.

In this chapter, we look at how addiction to substances such as alcohol and methamphetamines can occur, as well as behaviours such as gambling.

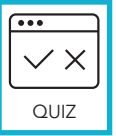
Did you know?

People can be addicted to any number of behaviours, such as shopping, cleaning, pulling out their hair, plastic surgery, tattoos, stealing and many others.

Review 2.1

The addicted neuron

- 1 Explain how understanding memory and learning in terms of addiction can be useful.
- 2 Describe the changes at the neural level that occur when we learn or form a memory.
- 3 Discuss the role of serotonin and endorphins in the body system, and then consider the role they play in addiction.
- 4 Discuss the roles of the key neurohormone and key neurotransmitter in memory and learning.



2.2 Alcohol

Alcohol is the most widely used drug in Australia, with 79 per cent of adults aged 18 years and over drinking on a regular-to-occasional basis (Australian Bureau of Statistics, 2019). According to the Australian Institute of Health and Welfare (AIHW), alcohol is absorbed quickly into the bloodstream and can begin impacting the nervous system and the brain within five minutes (AIHW, 2019).

Short-term and long-term effects of alcohol usage relate directly to the impacts that alcohol has on our neurons and neurotransmitters.

Alcohol a depressant drug that is legal and the most commonly used drug in Australia.

Short-term effects of alcohol

Initially, alcohol makes us feel relaxed and uninhibited. This is due to it being a **depressant drug**. Depressants slow down the activity and neural impulses between neurons within the brain and nervous system. Our physical and mental energy can fade as our metabolism also slows down. This makes us feel really relaxed.

Depressant drug a drug that slows down the body and brain and inhibits metabolism.

In addition to this, alcohol can release endorphins, as well as serotonin, which make us feel happy and 'feel good'. *Most importantly*, alcohol can affect dopamine levels. An amplified effect of dopamine causes the reward pathways in the brain to fire, which means we learn to associate drinking with the feeling of pleasure and relaxation. Moreover, alcohol can amplify the impact of GABA (gamma-aminobutyric acid), an inhibitory neurotransmitter that makes us feel calm.



Figure 2.3 In Australia, 79 per cent of adults aged 18 years and over drink on a regular-to-occasional basis.

As people continue consuming alcohol, however, there can be *harmful effects*. **Binge drinking**, which is defined as consuming more than four standard drinks at the one time, is very risky and can cause **blackouts**, which are small periods of amnesia where a person cannot recall an event even though they were awake and present at the time. We have spoken about how important dopamine is for learning a behaviour we like and then how we learn to repeat that behaviour. However, alcohol can also *suppress or limit* the activity of glutamate. Because glutamate is essential for the long-term changes at the synapse level when a memory is formed, it is not surprising that large doses of alcohol can block memory formation. This can be a disorienting and unpleasant experience for a person, particularly the day after a blackout.

Binge drinking ingesting several drinks at the one time; for men, five to seven drinks is considered a binge and for women it is three to five.

Blackout a small period of amnesia experienced (when using alcohol) that occurs when the person is awake.

Another harmful effect of alcohol is that, in higher doses, it can also cause loss of coordination, slowed reaction times, nausea, vomiting, unconsciousness and death. This is mostly due to the nature of alcohol as a depressant that slows down the brain and nervous system.

Long-term effects of alcohol

Alcoholism is the term used to refer to people who are addicted to the drug. People can grow to have a dependence on alcohol and become unable to control their consumption despite the



Figure 2.4 Alcohol use, especially in large or frequent doses, can result in alcoholism, memory problems and health issues.

physical and psychological harms it is having on them. This dependency and addiction is partly due to the initial pleasant side effects of alcohol as well as the amplification of the dopamine reward pathways in the brain. Alcoholics begin to anticipate their next drink, and the dopamine surge they experience causes them to repeat their behaviour despite the prospect of long-term negative impacts.

Alcoholism a condition where someone is dependent on or addicted to the consumption of alcohol.

Other long-term effects of alcohol usage, particularly for alcoholics, include **liver cirrhosis**, brain damage, heart disease, stroke and cancer.

Liver cirrhosis damage and scarring of the liver, which can lead to liver disease.

The short-term and long-term effects of alcohol are presented in Table 2.1.

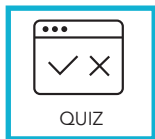
Short-term effects	Long-term effects
Reduced inhibitions	Addiction/alcoholism
A sense of relaxation	Liver cirrhosis
Feelings of happiness or feeling good	Brain damage
Loss of alertness	Heart disease
Loss of coordination	Cancers
Slowed reaction times	Stroke
Impaired memories, possibly blackouts	Injuries sustained from risky behaviours while under the influence of alcohol (e.g. drink driving)
Impaired judgement	
Nausea, vomiting	
Blurred vision	
Unconsciousness	

Table 2.1 The effects of alcohol consumption

Source: Based on AIHW (2019)

Did you know?

Between 1920 and 1933, alcohol was prohibited in the United States. Although not ever illegal in Australia, in the early 1900s it was not possible to buy alcohol in Canberra and the Australian Capital Territory.



QUIZ

Review 2.2**Alcohol**

- 1 Explain what is meant by alcohol being classified as a depressant drug.
- 2 Identify and explain the neurohormones and neurotransmitters that alcohol can affect.
- 3 Describe how blackouts occur.
- 4 Outline other harmful impacts that alcohol can have.
- 5 Define alcoholism.
- 6 Identify two short-term and two long-term effects of alcohol.

2.3**Methamphetamines**

Methamphetamines are **stimulant drugs** that can be found in three forms: base, powder ('speed') or crystalline ('ice'). Stimulant drugs increase the speed of neural transmission between the brain and central nervous system. Methamphetamines are considered to have the strongest impact of stimulant drugs. Methamphetamines are perceived by users to be readily available in Australia, and this remains a serious health concern as methamphetamines can have harmful impacts on the brain and body. In fact, deaths involving methamphetamines (and other stimulants) are increasing in Australia, with deaths reported at a level four times higher than 20 years ago (AIHW, 2019). The biggest users of methamphetamines are Australians aged between 20 and 40 years of age. According to the Australian Criminal Intelligence Commission (ACIC), half of police detainees tested positive to stimulants, with methamphetamines the most common stimulant consumed. Of those entering the prison system, 65 per cent of prisoners reported illicit drug use in the previous 12 months, with

methamphetamines being the most commonly reported (ACIC, 2019).

Stimulant drug a substance that speeds up messages going to and from the brain, keeping a person awake and alert.



Figure 2.5 People may try drugs out at parties or social settings because they mistakenly think these will help them have a good time, without understanding the harmful impact that drugs such as methamphetamines will have on their nervous system.

Short-term effects of methamphetamines

Initially, methamphetamines make people feel energised, **invincible** and alert. This is because they are a type of stimulant drug that increases the speed of neural transmission in the brain and body, which increases the person's overall level of arousal. It also results in increased talkativeness, an increased heart rate, higher body temperature and faster breathing.

Invincible a feeling of being too powerful to be defeated or overcome.

Methamphetamines have a powerful effect at the neuronal level and this makes them highly addictive. When methamphetamines are consumed, there are increases in the amounts of serotonin and dopamine. Glutamate and **noradrenalin** can also be released, which, when paired with serotonin, can make a person feel **euphoric**.

Noradrenalin a neurohormone that plays a role in mood, sleep and blood pressure. Low levels of noradrenalin have been linked to depression.

Euphoric a feeling of intense happiness or excitement.

Yet methamphetamines also damage cells at the synapse because they 'switch off' the reabsorption mechanism of serotonin and dopamine. They do this by damaging **transporters**. Transporters are specialised cells in the central nervous system that are

responsible for removing neurotransmitters and neurohormones (such as serotonin and dopamine) from the synapse and repacking them for reuse at a later time. When a methamphetamine damages these transporters, initially it results in much larger amounts of serotonin and dopamine at the synapse, and so a person reports that they 'feel great'. However, there will be less dopamine and serotonin available for later use. This means the person may then have dysfunctional levels of dopamine and serotonin levels following the use of methamphetamines, resulting in depressed moods, **apathy** and **pessimism**. It can lead to a vicious cycle, where a person takes another dose of methamphetamine in order to 'chase' the feeling of euphoria. That is followed by low moods and so the cycle continues.

Transporters specialised cells that are responsible for collecting neurotransmitters and neurohormones present at the synapse and repackaging them for use at a later time.

Apathy a lack of interest in activities; a state of indifference.

Pessimism a tendency to focus on the negatives or to think the worst will happen.

In addition to this, the presence of dopamine ensures the person has learned that taking methamphetamines results in initial euphoria. Once they have learned this, they may want to take it again, despite the low mood that occurs afterwards.

Figure 2.6 Methamphetamine users have an increased risk of heart attacks due to overexcitement of the nervous system.



Long-term effects of methamphetamines

The long-term effects of methamphetamines are harmful. In addition to the death of transporters, methamphetamines can cause neurons to die due to the overexcitement of the nervous system. This can result in neurological damage to different areas of the brain and lead to memory loss, concentration problems, mood swings and mental health problems such as anxiety. Furthermore, due to the excitement of the nervous system, the risk of a heart attack or other cardio problems is much higher for users.

One of the saddest issues with methamphetamine use is the risk of addiction, due to the impact on the dopamine system and the vicious cycle of users chasing their next high. If users increase the potency of their dosage or the frequency of their usage, they can experience **psychosis**, where they lose touch with reality and even experience hallucinations or paranoia.

Psychosis an abnormal condition of the mind; a generic psychiatric term for a mental state often described as involving a 'loss of contact with reality'. It may be characterised by hallucinations or delusions.

The short-term and long-term effects of methamphetamines are presented in Table 2.2.

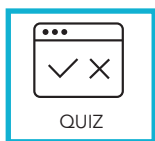
Short-term effects	Long-term effects
Increased attention and alertness	Addiction
Increased energy	Poor concentration
Euphoria and a sense of wellbeing	Poor memory
Increased talkativeness	Mood and anxiety disorders
Increased breathing, heart rate and body temperature	Chest pains
Decreased appetite	Heart attack
Jaw clenching and teeth grinding	Psychosis, such as paranoia or hallucinations
Nausea and vomiting	Weight loss
A dry mouth	Stroke
Aggression	Brain damage
Nervousness	

Table 2.2 The effects of methamphetamine consumption

Source: Based on AIHW (2019)

Did you know?

It can take up to four days for methamphetamine to leave the body. Furthermore, it is made from a number of dangerous and flammable chemicals, such as hydrochloric acid, drain cleaner, fertiliser and battery acid.



Review 2.3

Methamphetamines

- 1 Explain what is meant by methamphetamines being classified as a stimulant drug.
- 2 Describe the relationship between methamphetamines and the criminal system in Australia.
- 3 Identify and explain the neurohormone(s) and neurotransmitter(s) that methamphetamines can affect.
- 4 Explain what transporters are and the impact methamphetamines have on them. In addition, discuss the overall effect this can have on a person's use of methamphetamine.
- 5 Describe what psychosis is.
- 6 Identify two short-term and two long-term effects of methamphetamines.

2.4 Gambling

Gambling is an activity that is popular among Australians, with over 80 per cent of the population gambling at least once a year – the highest rate in the world. Moreover, 39 per cent of the population are regular gamblers, with participation in lotteries being the most common form, followed by scratchies and then electronic gaming machines such as pokies. In one year, Australians bet more than \$208 billion, which averages out at more than \$11 000 per person for those over the age of 18 years. These statistics are being continuously updated and can be monitored online at the Australian Gambling Statistics webpage run by the Queensland Government Statistician's Office.

Gambling an activity involving chance, where a person risks money in order to win.

Of the amount of money spent on gambling, not all is lost. However, people rarely win all their money back. In fact, each Australian over the age of 18 currently loses, on average, \$1250 each per year on gambling.

Gambling: what is it?

Traditionally, gambling is an activity where a person risks money, or belongings, on an uncertain outcome relating to a future event. Accordingly, there is an element of randomness, or chance, involved. The primary purpose of gambling is to win. However, as we will learn in this chapter, another purpose of gambling is experiencing the *thrill* of anticipation.

Why do people gamble?

There are many reasons why people might gamble, including as a distraction or an 'escape' from their life, or as a stress response. Often stressful events can be the 'tipping point' for a person's gambling to become out of control.

For example, in 2020 during the COVID-19 pandemic, the rates of gambling in Australia increased despite gambling venues closing during lockdowns. Research has indicated that one in three Australians signed up to

Figure 2.7 Gambling is an activity involving chance, where a person risks money in order to win.



a new online gambling account, with the most vulnerable age group being young men (18–34 years), who are most at risk of problem gambling (Jenkinson et al., 2020).

Risk factors

While there is no universal type of person who has a gambling problem, a person may be more at risk of developing a problem if they:

- start gambling at a young age
- have a big win in the early stages of gambling
- are around gambling often (e.g. see role models playing) and receive pressure from peers to gamble
- are exposed to a stressful event, such as a big payout (inheritance or severance), loss of job, a relationship breakdown or grief.

So, when is gambling a problem?

When a gambler cannot control the urge to participate, and it is having a negative impact on their life, we would now describe that person as a **problem gambler**.

Problem gambler when a person cannot control the urge to gamble and this is having a negative impact on their life.

Why do people keep on gambling when they understand they'll likely lose?

Anticipation: the lure of uncertainty

The outcome of any gambling activity is often the uncertainty of the outcome: 'Will I win or lose?' Dopamine is often released during periods of uncertainty. Specifically, dopamine may be released in *anticipation* of the result. Due to the anticipation and subsequent release of dopamine, people can choose to continue gambling.

The release of dopamine in gambling has similar impacts on the brain as drugs. Research shows that repeated gambling can have a long-lasting impact on the neural pathways in the brain, just like drugs can. Furthermore, people who develop problems with gambling tend to also develop problems with drug abuse. It is not uncommon for a problem gambler to also be a smoker or a drinker.

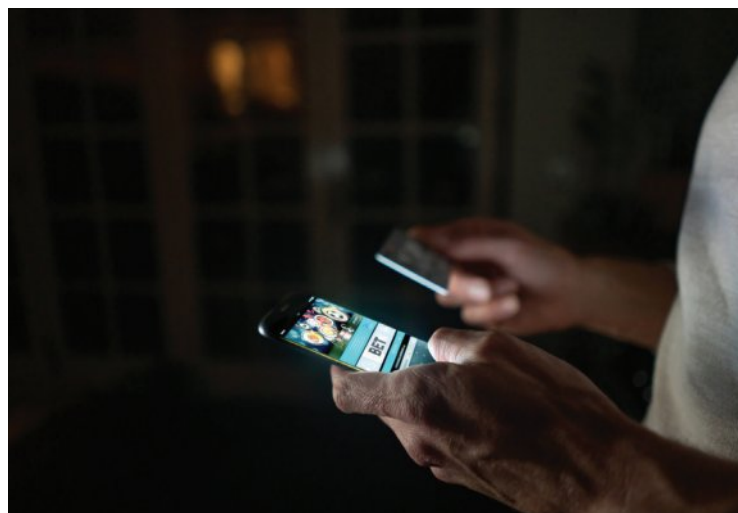


Figure 2.8 Smartphones make gambling websites and apps easier to access at all times, intensifying the issue for problem gamblers.

Chasing losses

Research shows that people who have repeated or longer exposure to gambling become less concerned about losing. In fact, it appears that losing can also trigger the release of dopamine in an addict's brain. So, when a gambler loses, rather than stopping due to the disappointment of the loss, they keep going *in the hope they'll win next time*, which releases dopamine. They feel good, reasoning: 'Maybe next time I'll win, don't worry about the loss, as I'll make my money back soon.'

This type of behaviour is called 'chasing losses', whereby, despite a streak of losses, the gambler continues to play or bet.

Losses disguised as wins

This phenomenon of 'losses disguised as wins' is perhaps one of the hallmarks of gambling games, such as poker machine ('pokies'). Pokies essentially have different lines on the screen and players often are able to bet on multiple lines at once. Pokies enable the player to win *some* of the lines, but not all, which results in the player having a win each time on the machine but, overall, they win less than they gambled. The person is pleased to be winning something despite the fact they are making a loss overall.

Let's say, for example, that a pokie is programmed to return 90 per cent of the amount gambled each time, so the person receives money each time they play – just less and less each time. The player is lulled into a false sense of winning something even though they are progressively losing. For example:

- first bet – \$10, loses but gets payout of \$9
- second bet – \$9, loses but gets payout of \$8.10
- third bet – \$8.10, loses but gets payout of \$7.20, and so on.

While a small minority of people will win the jackpot, only those who win a big amount and then never play again become the long-term winners. Importantly, all pokies in Australia and around the world are programmed to give payouts of less than 100 per cent, so people will eventually lose all their money if they play long enough.

Near-misses

Gaming designers can design their games to provide 'near-misses' where the gambler can see from the screen that they 'just missed out' on winning. When the screen shows how close the gambler was to winning, the gambler is *urged* to keep on playing because they feel like they 'nearly won'. Near-misses play a role in many compulsive games, including popular games like 'Candy Crush'.

Near-misses create a greater release of dopamine than losses and therefore can be biologically motivating for problem gamblers because they feel the urge to continue. Research shows that problem gamblers have amplified brain activity during near-misses (Sescousse et al., 2016). Neuroscientists consequently believe that dopamine does not signal pleasure, but instead signals to the brain when the person is *close to a reward* and this encourages them to have another attempt.



Figure 2.9 Near-misses play a role in many compulsive games. By showing on the screen how close the gambler was to winning, the gambler is urged to keep on playing because they feel like they 'nearly won'.

Activity 2.1

Probability of coins and dice

Part A

You and your partner will need a coin for this activity. Working in pairs, work out the odds of the coin landing heads up in each of the following cases:

- 1 one throw
- 2 two throws
- 3 20 throws.

Now test it out by throwing the coin you have once, twice and 20 times. If you have time in class, try throwing your coin 100 times and see how many times it lands heads up.

Based on the experiment, calculate the probability of throwing a head and deduce whether the probability changes the more times you throw.

Part B

You and your partner will need two dice for this activity. Working in pairs, what is the probability of:

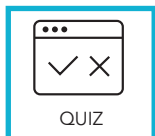
- 1 throwing one dice and it landing on a 6
- 2 throwing one dice 10 times and it landing on a 6 each time
- 3 throwing two dice and each of them landing on a 6?

Test it out by throwing the dice you have once and then 10 times. Now try throwing your pair of dice 20 times and see how many times they both land as a double 6.

Recall how many times you got a 6 on one dice and how many times you got a 6 on two dice. Based on the experiment, calculate the probability of throwing a 6 on one dice and deduce whether the probability changes the more times you throw. Repeat for two dice.

Did you know?

The history of Tattsлото in Australia began with George Adams in 1881 who immigrated from the United Kingdom. He was soon described as an 'undesirable' by the New South Wales and Queensland governments due to his interest in gaming. So Adams moved to Tasmania in 1895, and eventually sold his state lottery to the Tasmanian Government, creating Tattersalls.



Review 2.4

Gambling

- 1 Define gambling.
- 2 Recall how many Australians, on average, gamble each year and how many are regular gamblers.
- 3 Outline two reasons for why people gamble.
- 4 Identify four factors that place a person at risk of becoming a problem gambler.
- 5 Describe when gambling has become a problem.
- 6 Explain the impact of the following factors on dopamine and gambling behaviour:
 - a anticipation (the lure of uncertainty)
 - b chasing losses
 - c losses disguised as wins
 - d near-misses.

2.5

Judgement: the things we need to understand about gambling

'The house always wins'

The saying 'the house always wins' is very true. That is, all gambling products (such as pokies) are designed to win money for the venue owners (or 'the house').

Casinos also aim to take about 5–10 per cent of bets each time. Therefore, they do not rely on one-time bets. Instead, they rely on people returning and continually betting. The more a person bets, the more likely the casino is to win more money from that person. This is why casinos often make their areas attractive and exciting to gamblers, and why they have staff on the floor offering concierge service, such as taking orders for drinks and food.

Additionally, as explained earlier under 'Losses disguised as wins', often 'the cut' (or amount the house makes on pokies) is about 10 per cent. Therefore, if a gambler starts with \$10, they might 'win' \$9 back. The gambler then bets their remaining \$9 and will 'win' back \$8.10 (and so on). Each time, the house wins 10 per cent of the original amount gambled. If the gambler continues, they will eventually lose all their money.

Regardless of when they stop, a gambler will usually not end up with more than they started with.

The myth of gambling with skill

Sports betting agencies tend to argue that their gambling methods are not as bad as pokies because their gambling is a 'game of skill' rather than 'a game of chance'. Agencies argue that sports betting is a game of skill because gamblers can choose beforehand which sporting

team or horse they think will win, based upon their understanding of the team's or horse's previous form.



Figure 2.10 All gambling products are designed to win money for 'the house' – gamblers will eventually lose.

However, with 'skill-based gambling' there are still many factors outside the gambler's control. The gambler cannot control the odds or margins set by the betting agencies (which control them). The gambler cannot control the weather, the health of the jockey or if a team member gets injured (and so on). Gamblers can often not fully control their emotional influence on their gambling – that is, their emotions might cloud their judgement and decision-making. For example, they might find it hard to bet against their team if they have been a lifelong loyal supporter.

What are the odds of winning?

A lot of gamblers erroneously believe that if they keep on playing, they will improve their odds. This is false. The probability, or the odds, never change. Each time a person plays is a separate event. Therefore, the odds do not improve. The odds stay the same. For example: when you throw a coin, you have a 50/50 chance of the coin landing on heads. When you throw for a second or a third time, the probability *does not change* – there is always a 50/50 chance of getting heads.

According to Gambling Help Online (2020), in Australia:

- the chance of winning a \$5 scratchie is 1 in 1.7 million
- the chance of winning the first division in a lottery is 1 in 13.9 million
- the chance of winning the jackpot on a standard pokie with five lines is 1 in 9.7 million
- the chance of winning the first division in Powerball (6 numbers correct) is 1 in 54.9 million
- the chance of winning a \$5000 jackpot in Keno (7 numbers) is 1 in 40 000
- the chance of winning a \$25 000 jackpot in Keno (8 numbers) is 1 in 230 000
- the chance of winning a \$100 000 jackpot in Keno (9 numbers) is 1 in 1.38 million
- the chance of winning a \$1 million jackpot in Keno (10 numbers) is 1 in 8.91 million!



Figure 2.11 The chance of winning the first division in a lottery is only 1 in 13.9 million.

How do the odds really compare?

So, how do the odds of winning compare to the odds of other events? Let's think about the following. What are your odds of catching a six (when the cricket ball crosses the boundary without bouncing) at the MCG or Gabba? Consider this: there are approximately 90 000 seats at the MCG. Therefore, when there's a six hit at the cricket you have a 1 in 90 000 chance of being the one to catch it.

Your odds are better at the Gabba, which has 42 000 seats – so you have a 1 in 42 000 chance of catching a six, if it occurs. The odds may also improve depending on where you are seated.

Some other odds are:

- two people sharing a birthday (month and day) in a group of 23 or more: 1 in 2
- developing arthritis: 1 in 6
- being struck by lightning: 1 in 12 000
- drowning: 1 in 100 000
- tossing a coin and having it land heads 20 times in a row: 1 in 1 million
- winning an Olympic gold medal: 1 in 2.5 million
- dying from a shark attack in Australia: 1 in 8 million.

Gambling problems

Do you know someone who may have a problem with gambling? Or could you have a problem with gambling?

People with gambling issues tend to try to hide the problem due to embarrassment and/or shame. They also often believe they are in control of their problem.

Signs that a person may have a gambling issue:

- financial problems: borrowing money, selling assets, unpaid bills
- low mood, emotional swings
- withdrawing socially from family and friends
- secretive behaviour
- conflict with others.

Signs that you may have a gambling issue:

- spending more time and money on gambling than you planned
- thinking about gambling frequently
- feeling irritable when you're not gambling
- feeling the need to gamble more and more for excitement
- lying to others
- avoiding others.

Looking for help when it's needed

If you know someone who you think may be addicted to gambling, or you are concerned that you could have a gambling problem, **seeking help as soon as possible** is extremely important.

There is *no shame* in asking for help.

Where to get help

If you need someone to talk to, you can speak to a professional (such as your school psychologist or a trusted teacher) for advice.

You can also find out more about gambling online, via these organisations that can help:

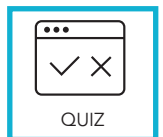
- Gambling Help Online – call 1800 858 858, 24 hours a day
- Lifeline (support for anyone having a personal crisis) – call 13 11 14, 24 hours a day
- ReachOut.com (youth mental health service) – online help.

You can also ask your doctor for advice.

Review 2.5

Judgement: the things we need to understand about gambling

- 1 Explain what the term 'the house always wins' means.
- 2 If a person had \$10 and was playing on the pokies, calculate how many bets on average it would take for them to lose \$5 to the house, if the house aimed to take 10 per cent of bets.
- 3 In terms of the 'odds of winning', determine which form of gambling has the best odds or best probability of winning and recall what are those odds.
- 4 If you bought a Tattsлото ticket in June and did not win first division, but then tried again and bought another ticket in July, would your chances of winning the lotto improve? Justify your answer.



2.6

End-of-chapter test



Multiple-choice questions

- The neurohormone that is responsible for activating reward pathways, motivation, motor movements and plays a role in memory and learning is:
 - Dopamine
 - Serotonin
 - Noradrenalin
 - Endorphins
- The neurohormone responsible for mood, wellbeing, sleep and the digestive system is:
 - Dopamine
 - Serotonin
 - Noradrenalin
 - Endorphins
- Methamphetamine has a different impact on the nervous system compared to alcohol. Methamphetamine tends to _____ the nervous system.
 - slow down
 - calm
 - speed up
 - relax
- During gambling, dopamine can be released:
 - In anticipation or uncertainty of the outcome of the future bet
 - When a gambler just misses out on winning
 - By continuing to gamble despite losing, in the hope that there will be a win next time
 - All of the above
- Continuing to gamble in the hope of winning next time (despite just losing the previous time) is known as:
 - Losses disguised as wins
 - Chasing losses
 - Near-misses
 - Gambling with skill

Short-answer questions

- Compare alcohol to methamphetamines and identify their similarities and differences by copying and completing the table below. The table has been started for you.

Alcohol	Methamphetamine
Can be addictive	Can be addictive
Depressant drug	Stimulant drug

- 2 Some of your friends open an online betting account because they have just turned 18 years old. Propose some advice about gambling that you could give your friends.
- 3 Is sports betting a 'game of skill' or a 'game of chance'? Choose whether you agree or disagree, and then justify your answer. You can use information in this chapter to help you answer this, and you could also do some further reading online to help make your decision.

Extended-response question

Research shows there can be a link between problem gambling and problem drinking, with some people being addicts of both. Discuss how this could happen at a neural level of the brain and what might put a person at risk of being addicted to both alcohol as a substance and gambling as a behaviour.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.



Figure 2.12 Addiction is hard to overcome, as a person's brain has been hardwired into particular behaviours.

Chapter 3

Beautiful minds

‘Mental health is not a destination, but a process. It’s about how you drive, not where you’re going.’

— Noam Shpancer, PhD



Mental health is, according to the World Health Organization (WHO, 2018), a state of wellbeing characterised by four features: (1) where a person is able to cope with normal **stressors**; (2) where a person recognises their own abilities; (3) where a person is able to contribute to the community; and (4) where a person can work productively.

Mental health the state of wellbeing of a person, including their ability to cope with stressors, work productively, and understand their own capabilities and contributions to the community.

Stressor an object, or an event, that causes stress.

Our mental health is very important. It affects how we feel, how we think and how we behave. Our mental health impacts our relationships, our life choices and also how we handle stress. It is something that we need to look after for our whole life. Moreover, our mental health can change throughout the life stages, so safeguarding it is an ongoing process.

When we have great mental health, we feel confident, satisfied with life and able to cope with pressures. We can, however, have periods of poorer mental health during our life. These periods of poorer mental health can be expected, or even considered normal, because any one person may be coping with greater levels of stress at times, such as caring for a sick family member, or dealing with a relationship break-up or a job loss. At times, poor mental health may continue for a longer period of time, or other factors may contribute to the development of a **mental illness**.

Mental illness a health problem that significantly affects how a person thinks, feels and behaves.

This chapter explores some of the main types of mental illness experienced by Australian teenagers. The chapter also looks at how to improve or maintain good mental health, highlighting strategies that can benefit all of us.



Figure 3.1 Positive mental health is a state of wellbeing.

Did you know?

People can mistakenly believe that people with a mental illness are dangerous. In fact, most people with a mental illness (90 per cent) have no history of violence, and many violent people do not have a mental illness (Everymind, 2021).

3.1

What is mental illness?

A mental illness is a health problem that significantly affects how a person thinks, feels and behaves. Mental illness is sometimes also described by the term ‘mental disorder’.

Mental illnesses are diagnosed by health professionals (such as doctors or psychologists) using the standardised criteria of the DSM-5 (*Diagnostic and Statistical Manual of Mental Disorders*, 5th edition; American Psychiatric Association, 2013e), which provides guidelines for experts. **Readers of this textbook should be careful not to diagnose themselves or others.**

A mental illness can cause suffering for the person experiencing it, as well as impact on their family and friends. Mental illnesses can be short-term or long-term and can interrupt a person’s life by causing dysfunction.

What causes mental illness?

A mental illness can be caused by a number of **risk factors**: attributes, or exposures, that a person may have that increase their likelihood of developing a mental illness.

Risk factors attributes, or exposures, that increase the likelihood of a person developing a mental illness.



Figure 3.2 A risk factor for mental illness can be loneliness or social isolation.

Risk factors include:

- adverse experiences (particularly earlier in life), such as childhood trauma or economic hardship
- experiences with other chronic medical conditions, such as cancer
- genetics (family history) or chemical imbalances in the brain
- having few friends or little social support from family
- loneliness or isolation
- substance abuse such as alcohol or other drugs, including prescription drugs.

It is important to understand, however, that a person could have one, or some, of these risk

factors and *not* develop a mental illness because they could also have a number of protective factors. A **protective factor** is any attribute or exposure that *decreases* the likelihood of mental health issues. These are factors that we can all personally influence for our own benefit, such as: good sleep patterns, healthy diet, exercise, relaxation techniques, and social support from family and friends. These factors are discussed in detail later in this section.

Protective factors attributes or exposures that can decrease the likelihood of a person developing a mental illness.

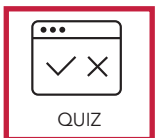
In Chapter 2, we looked at addiction.

Addictive disorders, such as substance abuse (e.g. alcoholism) and behavioural addictions (e.g. gambling), are also classified as mental illnesses in the DSM-5.

In this chapter, we look at the most common mental illnesses impacting adolescents in Australia, including attention deficit hyperactivity disorder (ADHD), anxiety, depression and conduct disorder. Another type of mental illness, called personality disorders, is investigated in Chapter 4.

Did you know?

The incidence of mental health disorders decreases as we get older. It is estimated that nearly 75 per cent of all mental health disorders emerge by 24 years of age.



QUIZ

Review 3.1

What is mental illness?

- 1 Define mental health and explain why it is important.
- 2 We can all experience periods of poor mental health in our lives. However, sometimes poor mental health develops into a mental illness. Deduce when this is more likely to happen.
- 3 Recall important events where people experience some of the greatest stress.
- 4 Explain what a mental illness is and how mental illnesses is diagnosed.
- 5 Outline some risk factors that increase the likelihood of someone developing a mental illness.
- 6 Explain how it is possible for someone to have a number of risk factors but not develop a mental illness.

3.2 ADHD

Attention deficit hyperactivity disorder (ADHD) is characterised by patterns of impulsiveness, inattention, hyperactivity and emotional regulation difficulties. Because ADHD affects mood, behaviour and thinking, it is classified as a mental illness in the DSM-5. ADHD is the most common mental disorder among Australian children and teenagers, and is also prevalent in the adult community. The distinction between children and adults with ADHD is that a child's symptoms are noticeably greater than is expected for their age, causing them distress, as well as problems functioning at school, with their friends and at home.

Attention deficit hyperactivity disorder (ADHD) a mental health condition that is characterised by patterns of impulsiveness, inattention, hyperactivity and emotional regulation difficulties.

Interventions (or treatments) for ADHD are important and can be very effective, helping sufferers embrace their strengths and manage their challenges. Unfortunately, **stigma** can discourage people from seeking help for ADHD, because they may feel ashamed or embarrassed about their condition, and wish to avoid dealing with the problem. It is important, therefore, for communities to be positive advocates for people seeking help for mental health issues, including ADHD, in order to help reduce any stigma.



Figure 3.3 Strengths of people with ADHD can include creativity and innovation.

One way for communities to do this is to discuss conditions like ADHD more openly, as well as recognise the strengths of people with ADHD, which may include their ability to be creative, innovative, enthusiastic, adventurous, loving, fun and loyal.

Stigma social disapproval of a person due to a personal characteristic.

Common signs and symptoms of ADHD

To be diagnosed with ADHD, the behaviours listed below must be shown to exist over six months across a variety of settings such as home, school, work and community settings. Further, these behaviours need to be inconsistent with the developmental level (age) of the person and to have also caused significant social and academic dysfunction and impairment (American Psychiatric Association, 2013a).

- 1 **Impulsiveness:** includes hasty acts that are done on the spur of the moment and without thought, such as interrupting conversations, using other people's things without asking, or taking over a task or activity that someone else is doing.
- 2 **Inattention:** includes not being able to maintain focus, such as missing details, not listening when spoken to directly, not finishing school work or chores, losing things and being forgetful.
- 3 **Hyperactivity:** includes excessive movement that is not appropriate or does not fit the environment, such as talking excessively, fidgeting or squirming, leaving a seat when expected to be seated and always being 'on the go'.

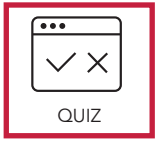
Importantly, ADHD is treatable and people can manage this condition effectively, leading happy and functional lives.

Impulsiveness hasty acts that are made on the spur of the moment and without thought.

Inattention not being able to maintain focus.

Hyperactivity excessive movement that is not appropriate or fitting to the environment.





Review 3.2

ADHD

- 1 Define ADHD and explain why it is classified as a mental illness.
- 2 Explain why people might not seek help for ADHD.
- 3 Describe how people in the community can assist those with ADHD to seek help.
- 4 Outline the common signs and symptoms of ADHD and recall how long these symptoms need to have presented for someone to be diagnosed.

3.3

Anxiety

Feelings of **anxiety** are common to all of us. It is what we feel when we are nervous about something. Feeling anxious when it is appropriate to the situation is considered normal; for example, nerves leading up to an exam, a party or a sports game are all natural feelings.

Anxiety feeling of fear, nervousness and a lack of control, or a sense of impending doom.

When we feel anxious at such an extreme level that it interferes with our daily routines and stops us from doing what we want to do, there may be a problem and we may have an **anxiety disorder**. Anxiety disorders are among the most common mental illnesses and, similar to other mental illnesses, they often begin in adolescence.

Anxiety disorder one of the most common mental illnesses diagnosed by clinicians and made up of many categories, such as eating disorders, phobias and generalised anxiety disorder.

A time of great stress is the teenage years. Adolescence is a period of massive changes and pressures, and the pressures on young people are increasing. Around 40 per cent of teenagers in Australia report feeling stressed either all the time or most of the time (Mission Australia, 2020).

As of 2021, in Australia 20 per cent of young people have anxiety-related conditions (Australian Bureau of Statistics, 2021). Due to the number of assessments, performance expectations and academic goals, schooling can be an enormous source of pressure for teenagers (Hall et al., 2019). Young females are more likely to experience anxiety than young males. Young females report twice the level of psychological distress.

Figure 3.4 In Australia, 20 per cent of young people have anxiety-related conditions.



In children and adolescents, one of the most common types of anxiety disorder is **generalised anxiety disorder (GAD)**.

Generalised anxiety disorder (GAD) an anxiety disorder that is more common among teenagers than adults, but can also begin in childhood. GAD is more common in girls than boys.

Common signs and symptoms of generalised anxiety disorder

There are four main features of GAD (APA, 2013c). These are:

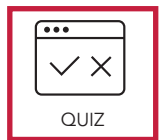
- 1 extreme worry, or anxiety, for at least six months about a number of events or activities
- 2 difficulty in controlling anxiety
- 3 at least three other symptoms of the following:
 - restlessness (feeling on edge)
 - being easily fatigued
 - irritability
 - muscle tension
 - difficulty concentrating
 - sleep problems
- 4 the anxiety is not due to substance use or another medical condition.

Importantly, anxiety is treatable and people can recover from it.

Review 3.3

Anxiety

- 1 Explain how an anxiety disorder is different from normal feelings of anxiety.
- 2 Define the term 'generalised anxiety disorder (GAD)'.
- 3 Describe the four main features of GAD and recall how long these symptoms need to have presented for someone to be diagnosed.



3.4 Depression

One in five Australians will suffer from **depression** at some point in their lifetime. In fact, according to the WHO (2020), depression is one of the biggest contributors to disease across the world, with over 264 million people diagnosed with the condition. Depression is a mental illness characterised by sadness, loss of interest and pleasure in life, and other negative emotions.

Depression a mental illness characterised by sadness, loss of interest and pleasure in life, and other negative emotions.

Approximately 5 per cent of Australian teenagers suffer from depression (Beyond Blue, 2020a). In adulthood, depression affects one in four women and one in six men. Like many mental illnesses, the **onset** of depression often occurs during adolescence. Sadly, in Australia four out of five young people will not seek support for depression because they are worried about what others might think of them. This is, again, an example of stigma.

Onset beginning point.



Figure 3.5 According to the WHO, depression is one of the biggest contributors to disease globally.

Adolescents are more at risk of depression if they have major stresses in their life or if someone in their family has suffered from depression. The stresses for a teenager may seem insignificant to adults, so it is important for parents and other carers to understand the enormity of a stress for a teenager. Stresses for teenagers include school failure, the break-up of an important friendship, bullying, parental conflict, loss of a parent, an accident or prejudice due to sexual preferences. Adolescents who suffer from depression often either do not know how to ask for help or refuse help.



Social support from schools and families can assist teenagers in seeking help and improving their mental health literacy. **Mental health literacy** refers to the knowledge and beliefs about mental health issues that help people recognise, manage or prevent mental health conditions. There is considerable evidence that school-based education on mental health can be very helpful for teenagers.

Mental health literacy the knowledge and beliefs about mental health issues that help people recognise, manage or prevent mental health conditions.

Depression in boys and men is often not recognised. They are less likely to talk about their emotions and are less likely to seek help (because they mistakenly think they need to be 'strong' or 'in control', or they are ashamed). Men are also likely to use alcohol or drugs in an effort to cope – but this often makes the symptoms of depression worse.

One symptom must be either depressed mood or loss of interest. People may show symptoms for much longer than this before there is a diagnosis. Symptoms can include:

- depressed mood for most of the day; tearfulness, sadness or 'feeling blue'
- lost interest or pleasure in activities previously enjoyed
- slowed thoughts and slowed actions
- fatigue
- irritability
- weight change and appetite change
- sleep problems
- feelings of worthlessness, guilt
- thoughts about death
- indecisiveness.

Like anxiety, depression is treatable and people can recover from it.

Did you know?

According to the *General Practice: Health of a Nation* report (Royal Australian College of General Practitioners, 2020), mental health disorders are the most common illness reported to family doctors.

Review 3.4

Depression

- 1 Define depression.
- 2 The onset of depression is usually in adolescence. Explain what this means.
- 3 Discuss the reasons why a teenager might not seek help for depression and how the community can help. You should also refer to mental health literacy in your answer.
- 4 Discuss why depression might be problematic for men.
- 5 Outline four symptoms of depression and recall how long these symptoms need to have presented for someone to be diagnosed.

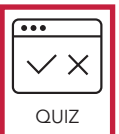


Figure 3.6 Depression in boys and men is not easily recognised due to their reluctance to seek help.

Common signs and symptoms of depression

To be diagnosed as depressed the person must be experiencing at least five of the following symptoms during the same two-week period.

3.5 Conduct disorder

Conduct disorder is the most common childhood and adolescent mental disorder in the world, and the fourth most common in Australia. The WHO (2019) estimates that 4–10 per cent of children suffer from conduct disorder, particularly boys. Children who have conduct disorder are also more likely to commit crimes and more likely to use drugs.

Conduct disorder a mental illness characterised by antisocial behaviour, including aggressive conduct, non-aggressive conduct, deceitfulness or theft, and serious violations of rules.

Conduct disorder is characterised by antisocial behaviour, including a persistent and repetitive pattern of behaviour where the societal rules and basic rights of others are infringed upon. There are four main types of behaviour that sufferers of conduct disorder demonstrate: aggressive conduct, destruction of property, deceitfulness or theft, and serious violations of rules.

Common signs and symptoms of conduct disorder

To be diagnosed with conduct disorder, three or more of the behaviours listed below must be shown over 12 months across a variety of settings such as home, school, work and community settings. Furthermore, these behaviours need to have also caused significant social and academic dysfunction and impairment (APA, 2013b). The behaviours are:

- 1 Aggressive conduct towards animals or people including bullying, threatening, initiating physical fights, using a weapon that can cause physical harm (e.g. brick, bat, broken bottle, knife or gun), or being physically cruel to animals or people.
- 2 Destruction of property, such as breaking windows, vandalism, setting fire to a car or house. The intention of the behaviour is to cause serious damage.
- 3 Deceitfulness or theft, including shoplifting, forgery or breaking into someone's house

or car, and frequently lying or breaking promises to others in order to obtain goods or avoid obligations.

- 4 Serious violation of rules, including breaking school and parental rules, and also societal rules that are age appropriate (that is, the child would understand the rule because they are considered old enough to understand). Examples include staying out late at night without parental permission, running away from home and wagging/truancy from school.

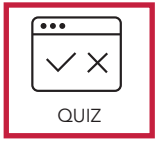
If conduct disorder persists over 18 years of age, most sufferers are then diagnosed as having **antisocial personality disorder (APD)**. This is discussed later in the book when we investigate psychopathy in Chapter 4. Notably, a diagnosis of APD is not possible for individuals under the age of 18 years. Children and adolescents who suffer from conduct disorder are also at greater risk of depression, anxiety and substance-related disorders.

Antisocial personality disorder (APD) a personality disorder (and mental illness) characterised by antisocial behaviour. It cannot be diagnosed until after the age of 18 years.

It is important to understand that many children diagnosed with conduct disorder can recover and may not be diagnosed with further mental illnesses as adults.

Figure 3.7 Theft is an example of deceitfulness and also one of the key characteristics of conduct disorder.





Review 3.5

Conduct disorder

- 1 Define conduct disorder.
- 2 Recall how common conduct disorder is, according to the WHO.
- 3 Describe the four main features of conduct disorder and recall how long these symptoms need to have presented for someone to be diagnosed.
- 4 Explain why children and adolescents with conduct disorder are not diagnosed with antisocial personality disorder.

3.6

Mental health literacy

How to maintain good mental health

Understanding how to care for our mental health is known as ‘mental health literacy’. The more we understand about mental health, the better. Mental health literacy helps us to recognise, manage and prevent mental health issues.

Good mental health can be managed and maintained through a number of protective factors. These protective factors decrease the likelihood of mental health issues and we can all personally influence them for our own benefit.

As noted earlier in the chapter, protective factors for good mental health include:

- sleep
- diet

- exercise
- relaxation techniques
- socialising
- purposeful activity
- avoiding, or reducing, use of alcohol and other drugs
- looking for help when it is needed.

Sleep

Sleep is very important for our general health and wellbeing. When a person *does not sleep well* they can suffer from poor concentration, mood swings, impaired performance, an impaired immune system, slowed reaction time and poor memory. It is not surprising, then, that good-quality sleep is the cornerstone of good health – particularly, good mental health. Fortunately, there are a few things we can all do to improve our sleep:

- 1 *Regular sleep patterns*: we should wake up each day at the same time – this sets our body clock so that we feel tired at a suitable time the following evening.
- 2 *Avoid light before bed*: our sleep hormone, melatonin, is released when it is dark. Melatonin helps us feel relaxed and drowsy. Therefore, limiting any light sources before we go to bed prepares us and increases melatonin levels in our body.
- 3 *Avoid naps*: try to restrict naps or, even better, avoid naps altogether, as they affect our overall sleep quality.
- 4 *Relax before bed*: having a warm bath or shower, or listening to music, before bed can help people unwind.

Figure 3.8 A number of different protective factors can be used to maintain good mental health.



- 5 *Avoid stimulants before bed:* for example, avoid consuming caffeine from five hours before bedtime if possible. Stimulants speed up the nervous system and make us more alert, which is not helpful when we're trying to get ready to rest.

Sleep is discussed in greater detail in Chapter 5.

Diet

The brain and body operate best on premium fuel. A diet high in low-premium foods, such as sugar, can be problematic for the brain and can worsen symptoms of mental illnesses such as depression.

Eating good-quality foods, such as vegetables, fruits, lean meat, fish and grains, is very important. An easy way to manage our diet is to consider the food plate shown in Figure 3.9 – the way to use the food plate is to eat mostly from the larger portions of the plate with food in the smaller portions eaten sparingly.

The food we eat *impacts how we feel*. This is because about 95 per cent of serotonin – the neurohormone that helps regulate a number of functions, including sleep, appetite, mood and perception of pain – is produced in the gastrointestinal tract, which is lined with millions of neurons. The production of serotonin, therefore, can be affected by what we eat.

There are a few things we can do to improve our diet:

- follow the healthy food plate, and eat more of the larger portions of the plate (grains, vegetables and fruit) and less of the smaller portions (such as dairy).
- pay attention to how we feel after we have eaten something.

Exercise

Exercise is very important for our health, and especially our mental health. This is due to a number of reasons:

- Exercise releases endorphins, a natural painkiller that makes people feel good.
- When people exercise, they tense their muscles, so following exercise the muscles

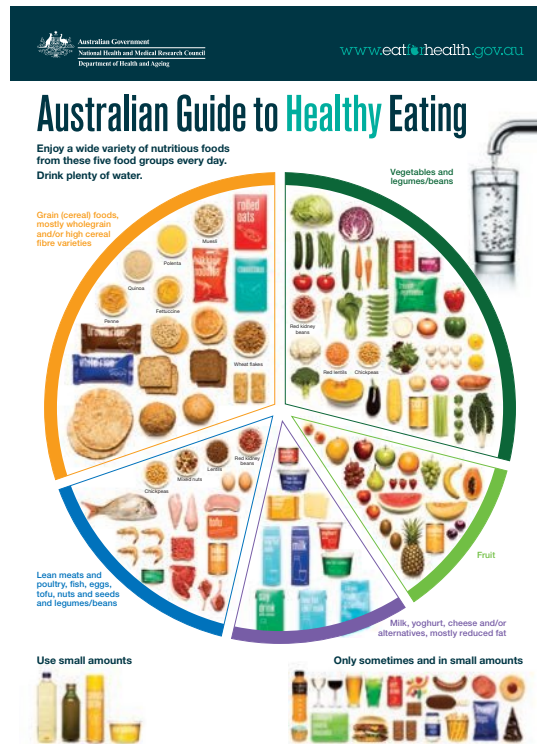


Figure 3.9 The Australian Guide to Healthy Eating (AGTHE), based on Australian Dietary Guidelines (2013). It can be seen in detail at the Eat for Health website.

then have to relax. For this reason, exercise *promotes* relaxation.

- Exercise strengthens the heart and lungs, and improves our ability to cope with stress responses.
- Exercise can be social when we share it with friends or teammates – this is very good for our wellbeing.
- Exercise can distract us from our worries and give us a mental break from daily pressures.

Relaxation techniques

There are many health benefits to **relaxation techniques**. Relaxation techniques lower the heart rate and blood pressure, improve mood and sleep quality, reduce negative emotions such as anger or frustration, and reduce the activity of stress hormones. Relaxation techniques are calming and increase people's awareness of themselves, turning their focus inwards. It does not matter which relaxation techniques are used – a person should choose those that work the best for them.

Relaxation technique a technique that can be used to improve mental health and quality of life.

Relaxation techniques take practice as they are a skill, so people need to give themselves time to learn and practise relaxation techniques before they become most effective. Some relaxation techniques to consider trying are shown in Table 3.1.

Relaxation technique	Description
Autogenic training	'Autogenic' means 'self-generated' and is a relaxation technique that focuses on physical sensations of heaviness, warmth and relaxation in different parts of the body.
Meditation	Meditation is a mind-body practice that is one of the oldest known methods of relaxation. There are many types of meditation; however, they have four common features: <ol style="list-style-type: none"> 1 a focus of attention (such as a word or a set of words that is repeated, or breathing) 2 an open attitude (letting distractions come and go) 3 a comfortable posture 4 a quiet location. Both yoga and tai chi utilise meditation within their practices.
Massage	The kneading and rubbing of muscles to relieve tension and pain.
Deep breathing	Taking slow, deep and even breaths. Counting while inhaling and exhaling can be really helpful; for example, inhaling for two beats and exhaling for three beats.
Yoga	Yoga is an ancient practice based on Indian philosophy. Originally a spiritual practice, many people globally use it as an effective method for improving both physical and mental health. Yoga typically has three elements: <ol style="list-style-type: none"> 1 <i>asanas</i> – physical postures 2 <i>pranayama</i> – breathing techniques 3 <i>dhyana</i> – meditation.
Tai chi	Tai chi is an ancient practice based on Chinese philosophy. It involves gentle movements and certain postures, while also practising relaxation, focus and breathing. If practised quickly, tai chi can also be a form of martial art or self-defence.
Aromatherapy	Also referred to as essential oils therapy, aromatherapy is an ancient technique that uses smell to improve a person's mood or wellbeing. When a person inhales an aroma, the molecules stimulate the olfactory system and limbic system, which can influence our emotions, memory, stress levels and physical wellbeing. For example, lemon is thought to relieve stress and improve mood, and lavender is thought to help with sleep and relieve headaches.
Muscle relaxation	Also referred to as progressive muscle relaxation, groups of muscles in the body are tightened and then relaxed, often starting from the toes and feet and working upwards.
Guided visualisation	People are taught to focus on a pleasant picture, or mental image, in order to replace negative or stressful thoughts or feelings.
Music and/or art therapy	Listening to music or drawing and/or painting can reduce stress levels.
Biofeedback	Biofeedback involves using devices that measure physical functions, such as heart rate, in a manner that teaches the person how to exert some influence or control over those bodily functions. For example, a person can practise breathing and monitor their heart rate from their device. This technique can be very effective as it helps a person feel in control of their body.

Table 3.1 Relaxation techniques that may improve mental health

Activity 3.1

Protective factors: relaxation and socialising

Choose four relaxation techniques from Table 3.1 that you would be willing to try. Name and describe each of these techniques in your notes and then discuss, with a partner from your class, those you chose and why.

Generally speaking, relaxation techniques are really helpful. However, for a very small group of people they may be a negative experience. As relaxation tends to increase people's awareness of themselves, with their focus turning inward, some people may experience intrusive thoughts, increased anxiety or fear of losing control.

Nonetheless, for the majority of people, relaxation techniques are well worth the effort. The bottom line is that relaxation techniques are *most useful if practised*, and more effective if they are continually used over a longer period rather than short-term.

Socialising

Social isolation has a negative impact on mental health, so, conversely, having social interactions with others can be immensely helpful for a person, particularly if they do not have much social support. Social activities can help people form new relationships and find a sense of belonging in their community. Furthermore, social activities provide greater social support – a major protective factor in good mental health.

If you know you may have less social support, activities to consider trying to help improve your mental health include:

- making time for family and friends
- joining a group or club that shares an interest with you, such as a drama club or a running club

Figure 3.10 Socialising and social activities can be protective factors for good mental health.



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- introducing yourself to your neighbours or people you see frequently.

Interestingly, recent research shows that simply increasing our number of friends is not as straightforward as we might think because *too many friends* can also be stressful and lead to fatigue if the person is trying to engage in too much socialisation. This is because our **social capital** (the time we have to devote to social interactions) is limited. So once we keep adding more and more friends, we have weaker relationships because we do not have as much time to invest in each one. An average rule of thumb is to have, for example, five close friends. Extroverts tend to report having more than five close friends, but they can pay a penalty, in terms of social capital, by having weaker relationships overall.

Social capital the time we have to devote to social interactions.

Purposeful activity

Purposeful activity refers to any activity that gives people meaning and satisfaction with their life. It is usually 'that something' that gets them out of bed in the morning. Purposeful activities tend to be personal and can include work, a hobby or a regular recreational activity.

Purposeful activity any activity that gives people meaning and satisfaction with their life.

Figure 3.11 Purposeful activities, such as volunteering in a community garden, can help promote good mental health.



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Purposeful activities help promote good mental health. Some examples of purposeful activities you could consider trying include:

- *Work*: work provides people with structure to their day and a sense of contributing to the community, thereby improving their feelings of self-worth.
- *Hobbies*: hobbies are a great way to spend spare time doing something enjoyable. Hobbies are personal and may include passions or interests such as playing an instrument, mountain-bike riding or painting.
- *Volunteering*: volunteering is when a person gives up their time, without payment, to help someone else or support a community program for the benefit of others. Places to consider volunteering include the RSPCA, Australian Red Cross, Starlight Children's Foundation, Meals on Wheels, or the local library or playgroup.

Pets

Research is increasingly showing that pet animals are positive for mental health. Pets make excellent companions and also encourage people to lead more active lives.

People who have pets tend to experience the following benefits:

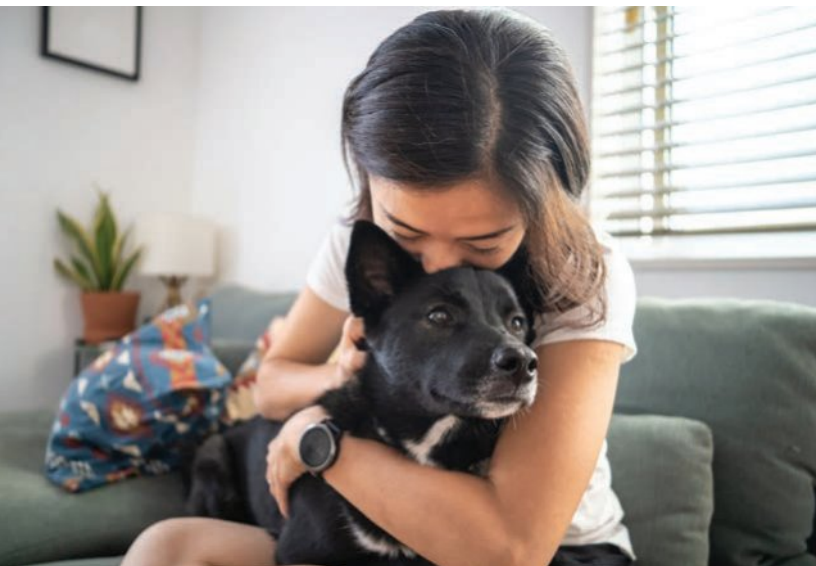


Figure 3.12 Pets can have an extraordinarily positive impact on people's mental health.

- *Exercise*: pets increase natural movement and activity in people, and if a person has a pet dog, they tend to be more fit due to the walks needed for their dog's health.
- *Reducing stress*: the simple action of patting a pet can reduce stress and decrease blood pressure; even watching fish in an aquarium can be very relaxing.
- *Socialising*: pets provide companionship to their owner and encourage social interaction, especially when people take their pets to parks or beaches, or join an animal club.
- *Purposeful activity*: pets provide a person with a sense of purpose because they have a responsibility to care for their pet – both pet and owner benefit from routine and organisation.

However, due to their circumstances, not everybody is able to have a pet. Some people may not be able to afford the cost of caring for a pet, they may not have the physical space, or their own personal health means they need to focus more on themselves and are not able to care properly for a pet. If people cannot have a pet, they are encouraged to consider trying many of the other protective factors available.

Avoiding alcohol and drugs

As discussed in Chapter 2, alcohol and other drugs change the ways the brain and body operate. These chemical changes can have a negative impact on our mental health. Consequently, minimising or avoiding alcohol and other drugs can be extremely positive for mental health. Ways to minimise or avoid alcohol include:

- not storing alcohol or other drugs in your house
- hanging out with friends who do not use alcohol or other drugs
- choosing drinks with less alcohol content or choosing non-alcoholic drinks
- letting your friends and family know you are trying to decrease the amount of alcohol or drugs you are consuming so that you have their understanding and support.

Activity 3.2

Reflection

Reflect on your personal observations of alcohol use. Have you or your peers had any experience with alcohol? Have you observed others? You may like to share your experiences and discuss alcohol use with the class. Alcohol is studied also in Chapter 2.

Looking for help when it's needed

The final protective factor for good mental health is looking for help when we need it. People tend to underestimate the impact of poor mental health, and may be too embarrassed or ashamed to ask for help. This is due to stigma, so we all need to encourage each other to talk about mental health and ask for help when it is needed.

Where to get help

If you need someone to talk to, you can speak to a mental health professional (such as your school psychologist) for advice. You can also find out more about mental health online, via these organisations that can help:

- headspace (mental health service for ages 12–25) and eheadspace (online and phone support)
- Lifeline (support for anyone having a personal crisis) – call 13 11 14, 24 hours a day
- Kids Helpline (telephone and online counselling for ages 5–25) – call 1800 55 1800
- ReachOut.com (youth mental health service) – online help

- SANE Australia (people living with a mental illness) – call 1800 187 263
- Suicide Call Back Service (anyone thinking about suicide) – call 1300 659 467.

You can also ask your doctor for advice and other mental health resources.

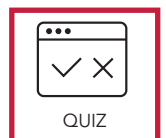


Figure 3.13 It is important to seek help if you're struggling with your mental health. There is no shame in seeking help.

Review 3.6

Mental health literacy

- 1 Explain why sleep is important for good mental health.
- 2 Explain why diet is important for good mental health. Discuss the neurohormone serotonin in your answer.
- 3 Describe how relaxation techniques can be helpful for mental health.
- 4 Define the term 'social capital' and explain how this might impact socialising.
- 5 Explain what a purposeful activity is and describe how it might improve mental health.
- 6 Outline the benefits pets provide for mental health.
- 7 Identify the ways someone can minimise or avoid alcohol and/or drugs.
- 8 Explain why we should encourage people to seek help if they have a mental health issue, and recall some of the resources available to help people.



3.7

End-of-chapter test



Multiple-choice questions

- 1 A symptom of ADHD is _____ and a strength of ADHD is _____.
 - A impulsivity; inattention
 - B inattention; creativity
 - C hyperactivity; impulsivity
 - D emotional regulation difficulties; low mood
- 2 Common signs and symptoms of anxiety can include:
 - A Antisocial behaviour and aggressive conduct
 - B Impulsivity and inattention
 - C Nervousness and sleep problems
 - D Sadness and lack of interest
- 3 Common signs and symptoms of conduct disorder can include:
 - A Antisocial behaviour and aggressive conduct
 - B Impulsivity and inattention
 - C Nervousness and sleep problems
 - D Sadness and lack of interest
- 4 A good diet is important for mental health, which can best be explained by the fact that:
 - A The food we eat impacts how we feel and the level of serotonin in our bodies
 - B Too much sugar can make us anxious
 - C Too many carbohydrates can make us gain weight
 - D We need to eat more foods from the smaller portions of the healthy food plate
- 5 Ways to reduce stigma about mental illnesses include:
 - A Educating the community about mental illnesses
 - B Encouraging the community to talk more about mental illnesses and the resources available
 - C Getting schools to promote mental health programs for students
 - D All of the above

Short-answer questions

- 1 Ji-Soo has been feeling irritable for a few weeks. She's also feeling quite stressed about school exams that are coming up.
 - a Propose some resources that you would encourage Ji-Soo to consider accessing to understand why she may be feeling this way.
 - b Outline some protective factors you could encourage Ji-Soo to consider trying out to improve her mental health.
- 2 Justin has recently been diagnosed with ADHD. He's feeling really embarrassed and has not been to school for a few days. He has also stopped answering when his friends phone or text.
 - a Deduce why Justin might be feeling embarrassed and explain how this issue could be improved.
 - b Outline some protective factors that you could encourage Justin to consider trying out to improve his mental health. *Hint: these protective factors would help manage a problematic behaviour that Justin is showing.*

Extended-response question

Marjorie has recently turned 75 and has retired from her part-time job. After a routine check-up with her doctor, she is diagnosed with cancer and needs to start treatment. Marjorie experiences a low depressed mood. Her doctor suggests to Marjorie that she makes sure she walks every day and also consider getting a pet dog as she lives on her own.

Discuss Marjorie's mental health by linking her circumstances to your understanding of risk and protective factors.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.



Figure 3.14 We all need to look after our mental health.

Chapter 4

Psychopathy and personality disorders: misunderstood aspects of human nature

‘People who can be very good can also be very bad too.’

— Agatha Christie

What is it that makes people do good things or makes people commit bad acts? Are people born bad or do they become that way? And, more importantly, in every good person is there an element of bad? This chapter explores what it is about human nature that sometimes leads people to behave in ways that are antisocial and destructive. In this chapter, we also investigate psychopathy, a subtype of antisocial personality disorder (APD) as well as borderline personality disorder (BPD).

4.1

What is personality?

Personality is a way of thinking, feeling and behaving that makes any one person unique (American Psychiatric Association, 2013d). Personality is formed by two major influences: a person's inherited characteristics (genetics) and their environment (surroundings and situations). A person's personality is thought to be stable and enduring over their lifespan. Some people, however, can think, feel and behave in a manner that is different from what is expected, causing them distress and **dysfunction**. These people are thought to have a **personality disorder**.

Dysfunction working abnormally or incorrectly.

Personality disorder a mental disorder characterised by a pattern of thinking and feeling about themselves and others that can have a negative impact on a person's life and functioning.

Personality disorders are a form of mental disorder. As introduced in Chapters 2 and 3, the main diagnostic tool for mental disorders is the DSM-5 (*Diagnostic and Statistical Manual of Mental Disorders*, 5th edition; American Psychiatric Association, 2013e). Personality disorders are often not diagnosed until a person is over the age of 18 years. Children and teenagers under the age of 18 are not diagnosed because their personalities are still developing. Also, children can show symptoms of a personality disorder, but in fact their

symptoms are due to a developmental delay (rather than a personality disorder). So, children can 'grow out' of problematic thinking and behaving. Hence, clinicians prefer to wait until late adolescence or early adulthood to diagnose personality disorders.

Did you know?

Although personality is thought to be stable across the lifespan, research indicates that people become 'nicer' as they age because their level of conscientiousness increases.

How personality traits differ from personality disorders

Personality disorders are characterised by symptoms that are *long term and ongoing* and are exhibited by those over the age of 18 years. **Readers of this textbook should be careful not to diagnose themselves or others.** To do so would be unethical. Only qualified and trained clinicians can diagnose a person with a mental disorder. Ethics will be investigated further in Chapter 9; they are important guidelines for us all to follow in life.

It is important to distinguish between **personality traits** and personality disorders. We *all* have personality traits, which are our personality characteristics. However, people with personality disorders are *not adaptive* (they do not change), and their disorder causes them long-term dysfunction and distress (Sansone & Sansone, 2011).

Personality traits personality characteristics that each person has that are unique to them.

Did you know?

It is estimated that approximately 10 per cent of the world's population has a personality disorder, and of patients in psychiatric care an estimated 40–60 per cent are thought to have a personality disorder, making this a common psychiatric illness.



Figure 4.1 Personality makes individuals unique from each other – everyone has different ways of thinking, feeling and behaving.

What are the main types of personality disorders?

According to the DSM-5, personality disorders are defined by a pattern of thinking and feeling about oneself and others that impacts on the person's functioning in a significant and adverse manner. Two major characteristics of personality disorders are: (1) having severe difficulties with relationships with others; and (2) problems

regulating their own thinking, feelings and impulses about themselves and others.

There are 10 distinct types of personality disorder, as listed in Table 4.1.

Sociopathy a term that can be applied to a person suffering from antisocial personality disorder (APD).

	Type of personality disorder	Pattern of thoughts, feelings and behaviour
1	Antisocial	Not conforming to social norms, and having a disregard of the rights of others, including deception and impulsive behaviours. Some clinicians refer to antisocial personality disorder (APD) as sociopathy . A subtype of APD is psychopathy, which will be discussed in this chapter.
2	Avoidant	Unwillingness to be involved with others due to fear of rejection, extreme shyness, extreme sensitivity to criticism and judgement by others
3	Borderline	Unstable relationships, poor self-image, intense emotions, including feelings of emptiness, and can be characterised by suicidal thoughts
4	Dependent	Difficulty making daily decisions, fear of inability to care for themselves, submissive to others, needing to be cared for by others
5	Histrionic	Attention-seeking behaviour and exaggerated emotions
6	Narcissistic	Need for admiration, with a sense of entitlement and self-importance; takes advantage of others and has a lack of empathy
7	Obsessive-compulsive	Preoccupation with control and perfection, may be inflexible with schedules and details, may work excessively to exclusion of family and friends. (Note: this is not the same as obsessive compulsive disorder, which is a form of anxiety disorder.)
8	Paranoid	Suspicion of others, has a negative view of others, does not tend to have close relationships with others, assumes others are out to deceive them
9	Schizoid	Expresses little emotion and tends to detach themselves socially from others, does not tend to respond to praise or criticism, chooses to be on their own
10	Schizotypal	Distorted thinking and eccentric behaviour, uncomfortable with close relationships, has odd thinking and odd beliefs. (Note: this is not the same as schizophrenia, which is characterised by psychosis.)

Table 4.1 Summary of the 10 personality disorders listed in the DSM-5

Source: American Psychiatric Association (2019)

This chapter focuses on psychopathy, which is a subtype of APD, as well as borderline personality disorder.

Activity 4.1

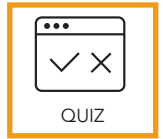
Personality disorders

Choose five personality disorders from Table 4.1 and summarise them in your notes.

Review 4.1

What is personality?

- 1 Explain what personality is and how it is formed.
- 2 Explain what personality disorders are and how they can be diagnosed.
- 3 Contrast personality traits with personality disorders.
- 4 Recall the two major characteristics of personality disorders, according to the DSM-5.



4.2 Psychopathy

Did you know that around 1 per cent of the world's population is thought to be psychopathic? This is a surprising figure, as most people associate 'psychopath' with a person to be feared. Should we fear one out of every 100 people? There are many stereotypes about psychopaths. People believe, for example, that all prisoners must be psychopaths, or that all psychopaths are violent and psychotic. These are generalisations and are neither fair nor accurate. In fact, the majority of psychopaths are not violent and social views of psychopaths can, therefore, be inaccurate (Skeem, 2011). Only about 25 per cent of prisoners in Australian prisons meet the criteria for psychopathy. Therefore, it would be wrong to say that all psychopaths are criminals or that all criminals are psychopaths. Psychopathic people can live a normal life and never commit crimes. In fact, criminal psychopaths are the minority – psychopaths in the normal world, such as the workplace, are the majority and are considered 'successful psychopaths' as they may be able to inhibit or prevent some of the more antisocial tendencies of their disorder (Lasko & Chester, 2020).

Psychopath a person who suffers from psychopathy. They tend to be impulsive and reckless and show little remorse or guilt for antisocial behaviours.



Figure 4.2 Most psychopaths are not violent and tend to function as 'successful psychopaths' in the workplace.

What does 'psychopath' mean?

A psychopath is someone who shows certain personality traits and behaviours. As psychopathy is a subtype of APD, a psychopath can also be called a sociopath because sociopathy refers to any subtype of APD.

A psychopath suffers from psychopathy, a type of personality disorder that occurs across all cultures. Psychopaths tend to make good first

impressions and often strike people as being relatively **normal**. Yet they are dishonest and undependable and often engage in reckless and inappropriate behaviour for no reason other than they think it is fun.

Normal the average, custom or standard level of something. In psychology, it means being 'free' of mental or physical disorders.

Importantly, psychopaths seem to experience little empathy or guilt. Furthermore, they have dysfunctional relationships because they have difficulty loving others or expressing their love. Psychopaths are impulsive and rarely learn from their mistakes. Psychopaths are more likely to be male, although the reason for this gender difference is unknown. A person needs to be over the age of 18 years to be diagnosed as psychopathic.

A common myth to dispel

Psychopathy does not mean psychosis. They are two separate types of psychological illness. Psychopathy is a subtype of APD, while psychosis is a symptom of a mental illness (such as schizophrenia) where a person loses their sense of reality and cannot function effectively in everyday life. A person suffering from psychosis may experience hallucinations and delusions, which can be reduced through the use of medication and therapy. Psychopaths, by comparison, are rational and understand (but simply do not care) that their actions are wrong in the eyes of society. Treatment for psychopathy is complicated, with no medication currently available. Therapy is the best option for psychopaths, but it has limited effectiveness. A lot of research is being conducted into the best therapy options for psychopaths.

It might be possible for a psychopath to also be psychotic, or for a psychotic person to suffer from psychopathy. However, these are rarely the case, so we cannot assume that the two go hand in hand.



Figure 4.3 Psychopathy does not mean psychosis. A person suffering from psychosis may experience hallucinations and delusions.

Workplace psychopaths

Psychopaths are likely to be living a normal, non-violent life. They harm their victims in non-violent ways. The most common psychopath is in the workplace. Psychopaths in the workplace can initially be very successful. Many psychopathic characteristics can be mistaken for leadership qualities – their cool decisiveness, fondness for the fast lane, charisma and cunning can be seen by employers as highly valuable characteristics. Yet psychopaths in the workplace can also be highly destructive, because they tend to lie and exploit others in order to get what they want. One in 10 workplaces has a psychopathic employee who functions effectively in normal society but victimises their colleagues, creating a toxic workplace (Clarke, 2012). It is thought that although 1–2 per cent of the world's population is psychopathic, there is a higher percentage in the business workplace, with about 3–4 per cent of corporate workers thought to be psychopathic (Mathieu et al., 2013). Experts argue that corporate psychopaths in leadership positions were likely instrumental in the Global Financial Crisis (GFC) of 2008–09, due to financial mismanagement and reckless behaviour (Boddy, 2011).





Figure 4.4 Corporate psychopaths in leadership positions were likely a big factor in causing the global financial crisis (GFC) of 2008–09, due to financial mismanagement and reckless behaviour.

4.3

How to measure psychopathy

Psychologists continue to argue about the definition of psychopathy and how it could be measured. There are two diagnostic tools that psychologists can use to measure psychopathy. One is the Psychopathic Personality Inventory (PPI) created by Hervey Cleckley, who was the first psychiatrist to study psychopathy in the 1940s. The other is the **Psychopathy Checklist Revised (PCL-R)**, created by psychologist Robert Hare in 2003. Hare's PCL-R is the most commonly used tool by clinicians today. It is a valuable diagnostic tool; however, psychologists still argue that psychopathy is not specifically referred to in the DSM-5 (although APD is) and that clinicians need to be very careful when labelling patients as psychopaths.

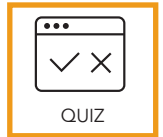
Psychopathy Checklist Revised (PCL-R) a diagnostic tool for measuring psychopathy; created by psychologist Robert Hare.

Hare's model argues that psychopathy is a personality disorder with four dimensions. The diagnostic tool can only be used by trained and qualified clinicians, particularly as a person's

Review 4.2

Psychopathy

- 1 Assess the statement: all criminals are psychopathic. Discuss why or why not this might be the case.
- 2 Explain the term 'successful psychopaths'.
- 3 Compare the relationship between psychopathy and sociopathy.
- 4 Outline the characteristics of psychopathy.
- 5 Explain what it means to experience psychosis.
- 6 Contrast the differences between psychopathy and psychosis.
- 7 Another name for workplace psychopaths is 'corporate psychopaths'. Describe two characteristics of workplace psychopaths.



score can have considerable consequences for their future. The potential for harm to a person's reputation is considerable if the checklist is misused. Moreover, the PCL-R is only validated for forensic populations, which means this checklist should only be used for criminal offenders. Robert Hare and his associates have created another psychopathy checklist, called the B-Scan 360, to measure corporate psychopathy. For the purpose of learning about psychopathy, however, the PCL-R is summarised and simplified in this chapter.

The four dimensions of the PCL-R

Personality disorders are characterised by symptoms that are *long term and ongoing* and are exhibited by those over the age of 18 years.

Remember, readers of this textbook should be careful not to diagnose themselves or others.

To do so would be unethical. Only qualified and trained clinicians can diagnose a person with a personality disorder.



Figure 4.5 Serial killer Ted Bundy (centre) scored 39/40 on the PCL-R.



When administering the PCL-R, a qualified clinician (e.g. psychiatrist) would conduct an interview of 20 items that takes approximately three hours to complete. The person receives a 0 (no match at all), a 1 (partial match) or a 2 (a reasonably good match) on each item, with a possible total score out of 40. To be considered a psychopath, a person would need a score of 30 or above. For example, two notorious serial killers scored highly: Ted Bundy is considered to have scored 39/40 and Brian Dugan 38/40 (Kiehl, 2014).

The first dimension of the PCL-R is the **affective dimension**, which measures the emotional capability of a person; in particular, their ability to feel empathy for others. Psychopaths tend to lack empathy and have shallow emotions. They also tend to lack remorse or guilt for actions that might hurt others and fail to accept responsibility for what they do.

Affective dimension relates to emotional state. An 'affect' is another way of describing an emotion.

The second dimension, **interpersonal dimension**, measures the extent to which a person is able to relate and connect with other people. Psychopaths tend to be charming and

charismatic, especially in the first meeting – this is why they can make good first impressions. However, they can also be conniving, manipulative and superficial. They also tend to be pathological liars and have a grandiose sense of self-worth.

Interpersonal dimension a person's ability to relate to and connect with other people.

The third dimension is the **lifestyle dimension**, which refers to how a person usually behaves and their way of living. Psychopaths tend to be impulsive, irresponsible, parasitic and stimulation-seeking (or prone to boredom).

Lifestyle dimension how a person usually behaves, their way of living.

The final and fourth dimension is the **antisocial dimension**, which measures the extent to which people show disregard for others and break social norms. Psychopaths may show early childhood behavioural problems, juvenile delinquency, poor behavioural control as adults with persistent rule breaking, and criminal versatility.

Antisocial dimension voluntary behaviour that breaks social norms and has no benefit to others, or shows disregard for others.



Figure 4.6 According to the PCL-R, there are four dimensions of psychopathy: affective dimension, interpersonal dimension, lifestyle dimension and antisocial dimension.

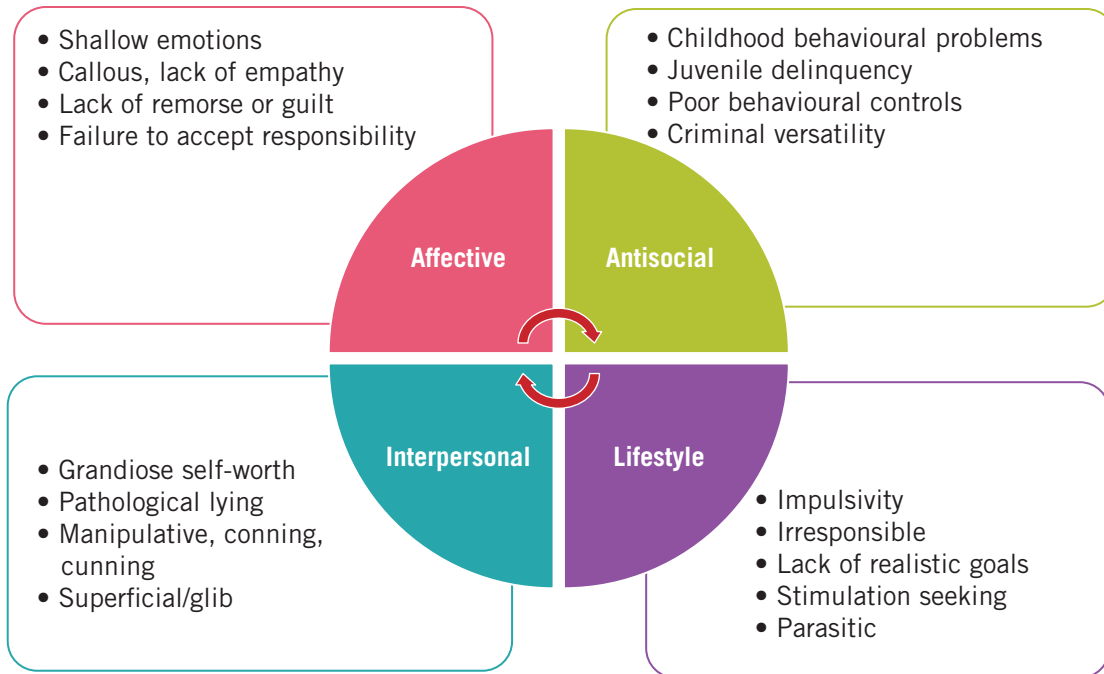


Figure 4.7 The four dimensions of the PCL-R

Our own behaviour

We can probably all admit to behaving in a way characterised by one of the four dimensions of the PCL-R. We might manipulate others (e.g. when trying to get what we want), act impulsively (e.g. buy something when we should be saving) or be callous (e.g. push through others in a queue). And we most likely have all been guilty of lying.

So, what distinguishes our questionable behaviour from psychopathy? The difference is that a psychopath consistently demonstrates psychopathic characteristics. It is not just the characteristics that are present that make a psychopath, but also what is absent or missing. A psychopath might be antisocial, but they will also have little to no **prosocial** behaviour; that is, prosocial characteristics are absent. A normal person might have antisocial moments, but still understands the importance and value of acting prosocially, such as helping or comforting others.

Prosocial voluntary behaviour intended to benefit another, such as helping, sharing and comforting others.



Figure 4.8 Prosocial behaviour, such as helping, tends to be absent in psychopaths.

Activity 4.2

Measuring psychopathy

Although only trained and qualified clinicians can diagnose psychopathy, it can be interesting to explore and research fictional and historical characters and whether they might show psychopathic features according to the PCL-R.

In pairs, research at least two fictional or historical characters who are sometimes referred to as being psychopathic – for example, the Joker from the *Batman* series or the Countess of Bathory. Determine whether or not they show psychopathic features according to the PCL-R. *Note that we should not research people we know personally as this is unethical, particularly as we are not trained.* Once you have completed your research, share and discuss your findings with the rest of the class.

To aid in research and discussion, Table 4.2 is a more in-depth explanation of each of the characteristics of the four dimensions of the PCL-R.

Dimension	Symptoms	Description
Affective	Shallow emotions	Difficulty connecting with others, emotions can be short-lived and can lack perspective, so they are quite self-centred (it's all about them: 'I'm angry', 'I'm unhappy'), and do not feel emotions for others
	Callous, lack of empathy	Insensitive, cruel disregard for others, unfeeling, cold-hearted
	Lack of remorse or guilt	Indifferent, unapologetic
	Failure to accept responsibility	'This was not my fault.' 'This was <i>their</i> fault, not mine.' 'They made me do this, I had no choice.'
Interpersonal	Grandiose self-worth	Arrogant, 'big-headed', 'massive ego', unrealistic sense of superiority
	Pathological lying	Compulsive lying, habitual lying, lies so regularly that they can also lie for no apparent reason
	Manipulative, conning, cunning	To dupe or swindle someone, dishonest or deceitful behaviour with the purpose of tricking someone, being skilled in deceit and evasion
	Superficial/glib	Insincere, not genuine, lacking depth of character
Lifestyle	Impulsivity	Act without thinking, on a whim
	Irresponsible	Behaviour that is reckless, rash, unwise, careless – such as speeding while driving or borrowing a lot of money without concern for debt
	Lack of realistic goals	Either no real goals or no plan for the future, or their plans or goals for the future are difficult or impossible to pull off
	Stimulation seeking	Also known as sensation seeking or thrill seeking, chasing novel or intense sensations (due to boredom)
	Parasitic	Exploiting others, living off others, taking credit for other people's work

Table 4.2 Descriptions of the characteristics of each dimension of the PCL-R

Dimension	Symptoms	Description
Antisocial	Childhood behavioural problems	(Up to 12 years of age) Problems with authority, problems regulating emotions (e.g. tantrums), defiance, mood issues as a child, mental health issues, not listening, may be in response to family difficulties or abuse
	Juvenile delinquency	(Up to 17/18 years of age) Any unlawful acts committed as a minor
	Poor behavioural controls	Similar to childhood problems but as an adult (e.g. poor emotional regulation) – lashes out, unpredictable behaviour
	Criminal versatility	Untroubled by breaking the law as more focused on their own behaviour (so don't care if their behaviour breaks the law) – often tend to show a range of crimes and criminal skills

Table 4.2 (Continued)

Review 4.3

How to measure psychopathy

- 1 Explain how we can measure psychopathy. In your answer, mention two well-known tools.
- 2 Explain why it is important to develop a tool that can measure for corporate psychopathy.
- 3 Discuss why the PCL-R as a diagnostic tool should not be used by just anyone.
- 4 Describe the characteristics of each of the four dimensions of the PCL-R.
- 5 Contrast the difference between prosocial and antisocial behaviour. In your answer, give examples of each.

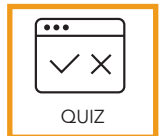


Figure 4.9 Only trained professionals can diagnose psychopathy, and it is important to remember you are unable to diagnose yourself or others.

4.4

Borderline personality disorder

Borderline personality disorder (BPD)

tends to be the most widely misunderstood personality disorder, with sufferers of the disorder having to contend with a great deal of social stigma from others who do not comprehend the reality of the condition.

Borderline personality disorder (BPD) a personality disorder (and mental illness) characterised by a long-term pattern of unstable relationships, distorted sense of self and strong emotional reactions.

It is thought that 3–4 per cent of the population has BPD, with the disorder tending to first appear in late adolescence and early adulthood, and women more likely to develop BPD than men. Like psychopathy, the causes of BPD are not well understood. It is thought to be due to a mixture of biological, psychological and social (including environmental) factors. Unlike psychopathy, BPD can be effectively treated through therapy and people can recover. For diagnosis of BPD, qualified clinicians will interview a person and get to know them over a series of appointments. Clinicians will then review whether that person may demonstrate the symptoms as described in the DSM-5.

Did you know?

Some sufferers of BPD claim online that the character Ralph from the Disney Pixar animation *Wreck It Ralph* has symptoms of BPD. This is not confirmed by the production company; however, Ralph does show a lot of examples of impulsive behaviour and frantic efforts to avoid abandonment in the film.

Why is this personality disorder called 'borderline'?

The term 'borderline' has a historical meaning. In the past, mental disorders were either classified as **neuroses** or psychoses. People who

presented with BPD symptoms did not fit as either neurotic or psychotic, and so clinicians coined the term 'borderline' to describe the disorder as being in between the two categories. This name has since stuck (National Health and Medical Research Council, 2012).

Neuroses an abnormal condition of the mind characterised by symptoms of stress such as depression and anxiety, but not a total loss of touch with reality.

What are the symptoms of BPD?

People with BPD tend not to feel comfortable within themselves (problems with self-image) and have problems regulating their emotions and impulses. They also can struggle to relate to others. For this reason, BPD can be distressing for a sufferer.

The diagnosis of someone with BPD can be made if they demonstrate several of the following symptoms. However, BPD can differ among sufferers, who may show different combinations of these features.

Signs and symptoms of BPD:

- being unsure of themselves
- frantic efforts to avoid abandonment (real or imagined), due to fear of people leaving them
- having intense and unstable relationships (e.g. loving then hating a person)
- taking risks or acting impulsively in ways that could harm them (e.g. drink driving)
- harming themselves and/or showing suicidal behaviour
- experiencing intense and uncontrollable anger that is disproportionate to the event
- becoming suspicious of others when stressed
- experiencing a persistent feeling of 'emptiness' inside
- experiencing short-lived but intense emotional 'lows'.



Figure 4.10 People who present with BPD do not fit as either neurotic or psychotic, and so clinicians coined the term ‘borderline’.

Could I have a personality disorder?

An important protective factor for good mental health is people seeking help when they need it. People tend to underestimate the impact of poor mental health and may be too embarrassed or ashamed to ask for help. This is due to stigma, as previously discussed, and we all need to encourage each other to talk about mental health and ask for help when needed.

If you think you may have a personality disorder, then the sooner you get help, the more effective your management of your mental health will be.

Where to get help

If you need someone to talk to, you can speak to a mental health professional (such as your school psychologist) for advice.

You can also find out more about mental health online, via these organisations that can help:

- headspace (mental health service for ages 12–25) and eheadspace (online and phone support)



Figure 4.11 People with BPD can have problems with regulating their emotions.

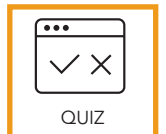
- Lifeline (support for anyone having a personal crisis) – call 13 11 14
- Kids Helpline (telephone and online counselling for ages 5–25) – call 1800 551 800
- ReachOut.com (youth mental health service) – online help
- SANE Australia (people living with a mental illness) – call 1800 187 263
- Suicide Call Back Service (anyone thinking about suicide) – call 1300 659 467.

You can also ask your doctor for advice and for more mental health resources.

Review 4.4

Borderline personality disorder

- 1 Explain what the term ‘borderline’ means.
- 2 Identify and list six of the key symptoms of BPD.
- 3 Identify a protective factor for good mental health and explain why it is important.
- 4 Recall and name one source that a person could contact for help or advice on mental health.



4.5

End-of-chapter test



Multiple-choice questions

- 1 According to Robert Hare's _____ there are _____ dimensions of psychopathy.
 - A PCL-R; two
 - B PCL-R; four
 - C PPI; three
 - D PPI; four
- 2 The affective dimension of PCL-R includes:
 - A Lying, grandiose self-worth and cunning
 - B Lack of empathy and guilt, and failure to accept responsibility
 - C Juvenile delinquency and persistent rule breaking
 - D Impulsiveness and irresponsibility
- 3 Psychopathy and psychoticism are _____ to each other. Psychopathy is a _____ whereas psychoticism is a _____.
 - A similar; personality disorder; symptom where a person loses touch with reality
 - B different; personality disorder; symptom where a person loses touch with reality
 - C similar; violent disorder; symptom of psychopathy
 - D different; violent disorder; symptom of psychopathy

Questions 4 and 5 refer to the fictional scenario below. Remember that only a trained and qualified clinician can ethically diagnose a mental disorder.

The police have arrested 17-year-old Samson, who has been torturing animals and wagging school. He is a habitual liar. When the police question him, Samson eventually breaks down and cries, saying that he knows he did the wrong thing and that he deserves to be punished. The police call Samson's parents to come and collect him from the police station. Samson's parents are shocked. Samson's mother tells the police, 'Sam is such a good boy. He helps his grandmother every week with her garden and helps his little brother with his homework all the time.'

- 4 Samson's helping behaviour is an example of _____ behaviour, which is _____ with psychopathy.
 - A antisocial; consistent
 - B prosocial; not consistent
 - C antisocial; not consistent
 - D prosocial; consistent
- 5 Samson is most likely:
 - A Psychopathic due to his behaviours that fall under the affective dimension
 - B Not psychopathic as he is only 17
 - C Psychopathic because he meets criteria of all four dimensions
 - D Not psychopathic as he does not meet the criteria for all dimensions, and he is not yet 18 years old

Short-answer questions

- 1 One of your friends says that someone who has hallucinations is psychopathic. Are they accurate? Justify your response.
- 2 Describe some of the symptoms experienced by someone who has been diagnosed with BPD.

Extended-response question

Compare and contrast psychopathy and BPD. Consider the similarities and differences between the two personality disorders.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.



Figure 4.12 Personality disorders can be easily misunderstood.

Chapter 5

In your dreams

‘It is a common experience that a problem difficult at night is resolved in the morning after the committee of sleep has worked on it.’

— John Steinbeck



Oh **sleep!** That wonderful eight hours a night when we drift off into an altered state of consciousness and leave the worries of the day behind us. Except, if you're like most teenagers, you are probably not getting the required amount of sleep and are waking tired and not as refreshed as you would like. Sleep is a state of consciousness during which we are unresponsive to external stimuli and experience a state of immobility. During this time, we also experience dreams, the vivid images and stories that play out while we are asleep. More and more is being discovered about sleep and dreams, and advances in technology are allowing researchers to know more about the mechanisms of sleep and the consequences to our physical and mental health of not getting enough.

Sleep a state of consciousness during which the individual is unresponsive to external stimuli and experiences a state of immobility.

This chapter will teach you all about sleep – what it is, why we do it and what happens to our brains when we sleep and dream. You will also learn about sleep deprivation and the very real consequences of not getting enough sleep. Finally, you will learn about dreams and dreaming – what happens to our brains when we dream and what recent research suggests about why we dream.

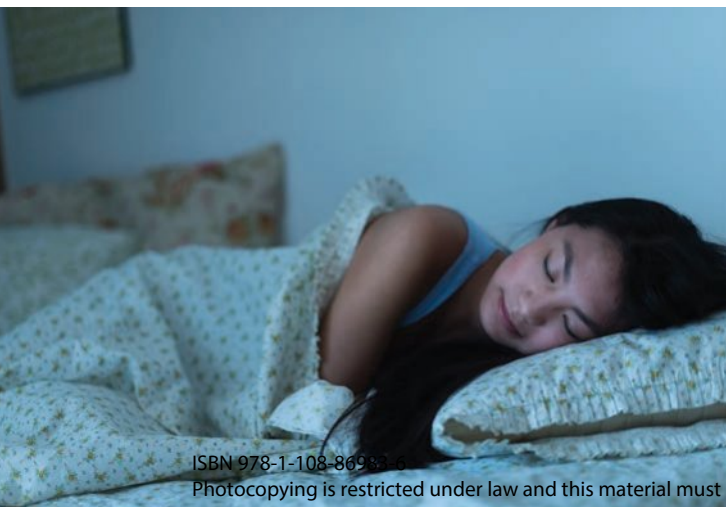
5.1 What is sleep?

As mentioned earlier, sleep is a naturally occurring, altered state of consciousness that operates on a 24-hour cycle – that is, we experience it every night, or once every 24 hours. It is considered an altered state of consciousness because our experience when we sleep is vastly different from when we are awake. We have lowered awareness, reduced or restricted movement, our senses are dulled and our time perception is also significantly altered. Sleep operates on a **circadian rhythm**, meaning that it occurs once every 24 hours. Circadian means ‘about a day’, and thus, the sleep-wake cycle is tied to the 24-hour day/night cycle. We have other biological circadian rhythms too – our alertness, our body temperature and some of our hormonal secretions operate on a circadian rhythm.

Circadian rhythm a naturally occurring body rhythm that occurs once in a 24-hour cycle.

These cycles are controlled by the **pineal gland**, a structure found in the *hindbrain*, behind the corpus callosum. The pineal gland is about the size of a pea and is so-named because it is shaped like a pine cone. The gland senses light information and this triggers the secretion of the hormone melatonin. Melatonin is responsible for making us feel sleepy. Higher levels of melatonin are released when it is dark, hence we sleep when it is dark. If we are left without external cues as to the time of day,

Figure 5.1 Sleep is an altered state of consciousness that we all need, although many of us don't get enough.



such as natural light, then over a period of time our sleep-wake cycle will extend to about 25 hours. This was the case with French geologist Michael Siffre, who, in 1962, lived underground for two months without any light cues. When people are deprived of light cues for longer, there is evidence to suggest that their circadian cycle might be pushed out by as much as 36 hours.

Pineal gland a small gland found deep within the brain and responsible for sleep and hormone development.

People who have sustained damage to their pineal gland through calcification – which can happen with age or because of tumours – often report changes to their circadian rhythms. They may sleep more or less, feel sleepy at unusual times, or feel restless at night when they should usually be asleep. The pineal gland is important not only for our sleep, but also because it contributes to other aspects of our health, such as drug metabolism and bone density.

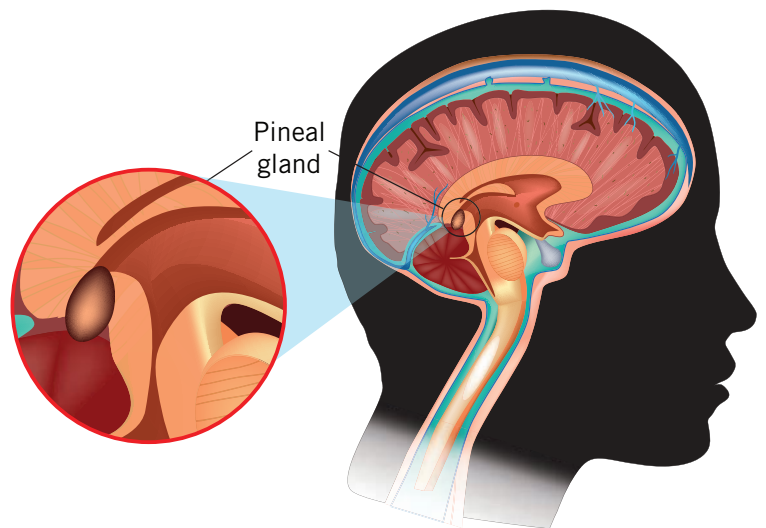


Figure 5.2 The pineal gland is a small structure located deep within the brain behind the corpus callosum. It secretes melatonin, which is the hormone responsible for sleepiness.

Did you know?

Did you know that animals all require different amounts of sleep and that sleep comes in many different forms for them? For example, chimpanzees create nests as beds and sleep around the same amount of time as humans – about nine hours in every 24 – whereas the albatross needs only 42 minutes a day! Lions, kings of the jungle, require around 20 hours of sleep. So, what accounts for the differences in animals' sleeping patterns? It seems that metabolic rate plays a part – animals that have high metabolic rates don't require as much sleep as those that have low metabolic rates. It also depends on whether the animal is predator or prey. Predator animals have less to fear so they're able to sleep longer than prey animals. Sea otters sleep in packs, holding hands so that they won't float away while they're dozing.

Activity 5.1

Sleep

- 1 Construct a table that compares being awake and being asleep in terms of the following: levels of alertness, movement, time perception and self-control.
- 2 Circadian rhythms operate on a 24-hour cycle. There are other biological patterns that operate on different cycles. Research and name these two cycles and identify two biological processes for each.

Although much is known about the circadian rhythms and their role in sleep and sleepiness, not as much is known about the homeostatic processes of sleep. As well as being determined by the 24-hour cycle and light and dark, sleep is also influenced by homeostatic functions. The homeostatic sleep drive model was first proposed in the 1980s. **Homeostasis** is the process by which the body attempts to maintain

equilibrium or balance. For example, our temperature has daily fluctuations, but is generally stable at around 37°C. With regard to sleep, homeostatic processes are seen in what sleep researchers call 'sleep pressure'; that is, the longer we go without sleep, the more we feel the need to sleep and the longer we extend that period of sleep. Then, once we have received this adequate amount of sleep, we are refreshed and the 'sleep pressure' has eased. This pressure operates independently of our circadian rhythms (sleep that occurs outside of this rhythm may not be as effective at refreshing us as normal sleep).

Homeostasis the process by which the body maintains equilibrium in its biological processes.

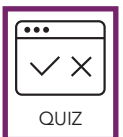
While the actual mechanisms of sleep homeostasis are not well understood, researchers seem to think it is partly due to the build-up of endogenous substances (such as **adenosine**) in the cerebrospinal fluid and that these dissipate when sleep occurs. This was supported by a 2019 study on zebra fish. When the fish were kept awake (because of caffeine or increased exercise), they slept longer, suggesting that it was increased brain activity that led to the increased need for sleep (Reichert, Pavón Arocas & Rihel, 2019).

Adenosine a neurotransmitter that is involved in the sleep process. A build-up of adenosine makes us feel sleepy and it is reduced by sleeping.

Review 5.1

What is sleep?

- 1 Define sleep.
- 2 Outline the two different processes that are involved in regulating our sleep-wake patterns. Explain how they are similar and how they are different.
- 3 Explain how stimulants such as caffeine affect the role of adenosine in the brain. Then discuss the consequences this has on our behaviour and, in particular, on our levels of alertness.



5.2 The different types of sleep

Not all sleep is created equal. There are two very distinct types of sleep – **rapid eye movement (REM) sleep** and **non-rapid eye movement (non-REM) sleep** – and each type serves a different, but equally important, function. REM sleep is a type of sleep that is characterised by the rapid movement of the eyes beneath the eyelids. Although you have just learned that the sleep-wake cycle operates on a circadian rhythm, our sleep stages operate on an **ultradian rhythm**; that is, they occur more than once every 24 hours. A typical sleep pattern over the night looks like the phases shown in Figure 5.3.

Rapid eye movement (REM) sleep a stage of sleep characterised by quick eye movements and beta-like, or ‘sawtooth’, brain waves. Most dreaming occurs in REM.

Non-rapid eye movement (non-REM) sleep stages 1 to 4 in the sleep cycle.

Ultradian rhythm a naturally occurring body rhythm that occurs more than once in a 24-hour cycle.

Although sleep is an altered state of consciousness characterised by little awareness, there is not a complete absence of activity. Internal physiological activity can be detected by a number of devices and these can help researchers learn more about sleep. Typically, devices such as an **electroencephalograph (EEG)**, an **electromyograph (EMG)** and an **electrooculograph (EOG)** are used in conjunction with other reports to gauge the levels of activity that occur. This recording of many physiological activities is known as **polysomnography**. An EEG measures the electrical activity of the brain; an EMG measures the electrical activity of muscles; and an EOG measures the electrical activity of the muscles that control our eye movements. Can you think why each of these would be useful when investigating sleep?

Electroencephalograph (EEG) a device that detects, amplifies and records the electrical activity of the brain.

Electromyograph (EMG) a device that detects, amplifies and records the electrical activity of muscles.

Electrooculograph (EOG) a device that detects, amplifies and records the electrical activity of muscles that control eye movement.

Polysomnography the measurement and recording of different body functions during sleep.

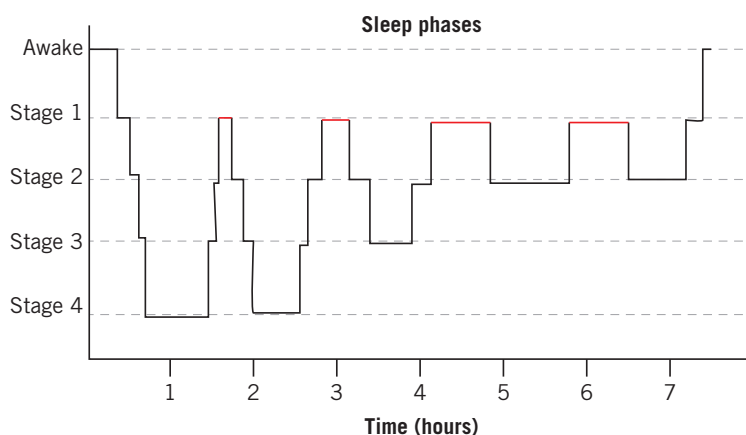


Figure 5.3 A typical night's sleep cycle can be seen in this image. Periods of REM sleep are indicated in red.

Using EEG measurements of the brain, it has been found that we have different levels of brain activity depending on what we are doing. For example, some sleep stages produce waves with a characteristic shape, each with their own name. These are alpha, delta, theta and beta waves.

Brain waves are described by their amplitude and their frequency. The amplitude refers to the length and width of the waves and the frequency refers to how many occurrences there are of that wave in a given time frame. Different readings on an EEG indicate different stages of sleep and wakefulness. If you are awake and alert, such as when you are reading this page, you would most likely be experiencing beta waves.

Beta waves have high frequency and low amplitude. If you are in a state of deep relaxation or drowsiness, then alpha waves would begin to appear. When theta waves appear, you are properly asleep and have entered stage 1 of sleep. After spending about five minutes in stage 1 sleep, stage 2 is entered and the EEG changes again, showing slightly larger waves and phenomena known as



sleep spindles and **K-complexes**. These are bursts of high activity or a large, high-amplitude burst of activity. Stages 1 and 2 are relatively light sleep stages, and sleepers can be easily woken from these stages.

Sleep spindles short bursts of high-frequency activity in brain waves.

K-complexes single sharp spikes in a low-amplitude series of brain waves.

Stage 3 is the next stage and low-frequency, higher-amplitude delta waves are present. After about 10 minutes of stage 3, the sleeper enters stage 4 sleep, where the EEG shows over 50 per cent delta waves. Stages 3 and 4 are deeper types of sleep when it is very difficult to be woken. These stages are often called slow-wave sleep (SWS) because of the slow frequency of the waves. The sleeper then goes back through the stages until they enter their first stage of REM sleep. It takes about 45 to 60 minutes to move through stages 1 to 4 of sleep. We then move back through each stage before heading into the first cycle of REM sleep.

A total cycle of non-REM and REM sleep takes approximately 90 minutes, with each cycle of REM lengthening as the night progresses, and stages 3 and 4 sleep becoming shorter and then disappearing altogether. This shortening of stages 3 and 4 of sleep, and the lengthening of the REM stages, explains why we often wake from the middle of a dream when the alarm goes off in the morning. When we enter REM sleep, an EEG reading would show high-frequency, low-amplitude waves that are very similar to the beta waves that occur when we are focused and highly alert. Why do you think that is? REM sleep was discovered relatively recently in 1953 by psychologists Eugene Aserinsky and Nathaniel Kleitman, who were observing the sleep habits of newborn infants.

Table 5.1 on the next page is a summary of these stages of sleep.



Figure 5.4 An EEG measures the electrical activity of the brain. It is harmless and painless and measures general brain activity.

to suggest that sleep plays a big role in memory and learning and that while we sleep our neural pathways are strengthened, thus increasing our learning and memory. In particular, sleep (REM sleep especially) plays a role in the consolidation of declarative memories (knowing ‘what’), although exactly what role it does play is still not clear. Think about your cognitions when you don’t get enough sleep. Can you think clearly? Is your memory affected? You will probably find that it is.

Interestingly, the role of sleep in procedural memories is more established. Procedural memories are often called ‘implicit memories’: they are the memories or knowledge of how to do something and they are often difficult to put into words. Research has found that lack of sleep leads to poor retention of motor tasks and slower speed and reduced accuracy on such tasks. It seems that stage 2 non-REM sleep is particularly necessary for this behaviour.



Why do we sleep?

Although the real functions of sleep are still widely contested, there is significant evidence


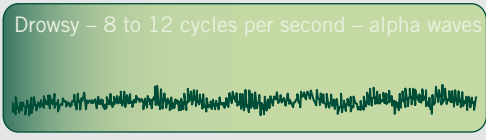
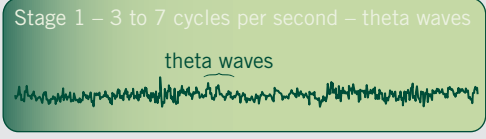
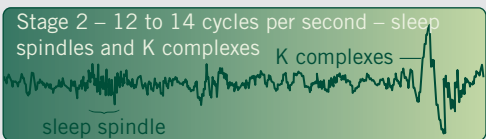
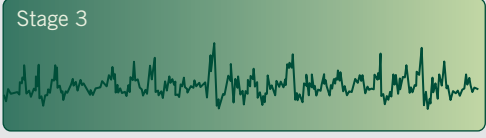

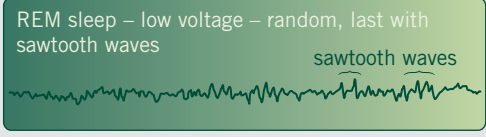
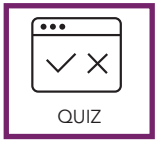
Stage of sleep	Type of brain wave	Description of brain waves	Illustration of brain waves
Awake and alert	Beta	Beta waves have high frequency and low amplitude.	Awake – low voltage – random, fast 
Awake but drowsy (in a state of deep relaxation)	Alpha	Alpha waves have medium frequency and medium amplitude.	Drowsy – 8 to 12 cycles per second – alpha waves 
Stage 1	Alpha and some theta	Alpha waves have medium frequency and medium amplitude. Theta waves have higher amplitude than alpha waves.	Stage 1 – 3 to 7 cycles per second – theta waves theta waves 
Stage 2	Theta (with sleep spindles and K-complexes)	Theta waves have a medium frequency and amplitude (although the frequency is lower than alpha waves and the amplitude is higher than alpha waves). Sleep spindles are bursts of very high-frequency waves and K-complexes are a single wave of very high amplitude.	Stage 2 – 12 to 14 cycles per second – sleep spindles and K complexes K complexes sleep spindle 
Stage 3	Theta and delta (less than 50 per cent delta waves)	Delta waves have the lowest frequency and the highest amplitude of all the waves.	Stage 3 
Stage 4	Theta and delta (more than 50 per cent delta waves)	Low frequency and high amplitude.	Delta sleep – ½ to 2 cycles per second – delta waves > 75 µV 
REM	Most similar to beta waves	Fast, sawtooth waves with high frequency and low amplitude.	REM sleep – low voltage – random, last with sawtooth waves sawtooth waves 

Table 5.1 Summary of the stages of sleep and the characteristic brain waves associated with each stage

A study conducted in 2000 by Maquet et al. found that brain activity patterns that occur during task practice, or initial learning, are then replayed that night during REM sleep, so our brains actively practise new behaviours or

tasks while we are asleep. Not only that, but the researchers found that when the subjects were tested the next day, their performance had improved. No wonder it is important to get a good night's sleep when you are studying!



Review 5.2

The different types of sleep

- 1 Compare and contrast the functions of an EEG, an EMG and an EOG, explaining what each one does and measures.
- 2 Explain why the reading of an EEG should not be used as the only device for determining if someone is awake or asleep.
- 3 REM sleep is sometimes known as paradoxical sleep. Explain what a paradox is and what the paradox is in this stage of sleep.
- 4 Describe how researchers are able to distinguish someone who is in REM sleep from someone who is awake and alert.
- 5 Describe the role that sleep has in our cognitive functions, such as memory and problem-solving.
- 6 There is some evidence that REM and non-REM sleep serve different purposes. Outline these differences.

5.3

Sleep deprivation

Sleep is considered to be as important for our health as diet and exercise. And yet four in 10 Australians say they are sleep deprived or do not receive adequate sleep. This number jumps to seven out of 10 adolescents who report being sleep deprived. It seems that Australia is in the middle of a sleep-deprivation epidemic – so much so, that a parliamentary inquiry was launched into the lack of sleep in 2018. It found that **sleep deprivation** cost the Australian economy a staggering \$66.3 billion in 2016–17! About \$26 billion was lost in financial costs and over \$40 billion in wellbeing costs (Commonwealth Parliament, 2018). But just what are these costs? What are the causes of sleep deprivation, what are the effects and how can we improve our sleep quality?

Sleep deprivation not getting enough sleep for our requirements.

Causes of sleep deprivation

Poor sleep can be caused by many things: biological factors such as illnesses; sleep

disorders and the adolescent sleep-shift; lifestyle factors such as work and electronics use; and environmental factors, such as lights, noise and sleeping environment.

Biological causes of sleep deprivation

There are many illnesses and disorders that prevent people from getting an adequate night's sleep. These include **insomnia**, or the inability to fall asleep or stay asleep when desiring sleep, and **restless leg syndrome (RLS)**, a neurological disorder that is characterised by an unpleasant and uncomfortable feeling in the legs and a consequential desire to move or kick them, particularly when trying to get to sleep. This leaves the individual unable to get to sleep and feeling unrested and fatigued the next day. Some statistics suggest that about 5 per cent of the population will experience RLS at some stage during their life.

Insomnia the inability to fall asleep or stay asleep when needed.

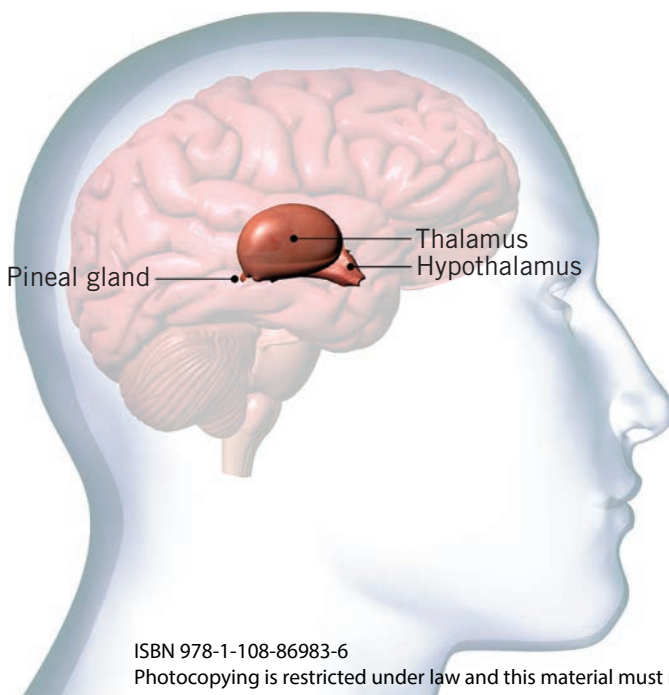
Restless leg syndrome (RLS) a neurological disorder characterised by an unpleasant and uncomfortable feeling in the legs when lying down and a consequential desire to move or kick them.

Many mental disorders or illnesses are also accompanied by insomnia or changes in normal sleep patterns. These disorders include depression, anxiety, post-traumatic stress disorder, schizophrenia and alcohol addiction. It is worth noting that sleep and mental disorders have a bidirectional causation; that is, some mental disorders cause sleep deprivation and some sleep disorders exacerbate mental disorders.

The adolescent sleep-shift is a well-documented phenomenon that is caused by the delayed release of melatonin during puberty. Teenagers need around 9–10 hours of sleep per night, but most report getting around 6–7 hours, which is a deficit of up to three hours per night, or 20 hours across the week.

As mentioned earlier, up to 70 per cent of teenagers report being sleep deprived and this is, in part, due to the sleep-shift they experience. With the arrival of puberty and the delay in the release of melatonin, teenagers don't often begin to feel sleepy until around 11 pm. However, most teenagers still need to get up early for school, at around 7 am, meaning they only receive around 6–7 hours of sleep. No wonder we like weekend sleep-ins!

Figure 5.5 Avoiding bright lights can assist in reducing the effects of sleep deprivation, as the pineal gland produces melatonin in response to darkness.



Did you know?

Microsleeps, as the name suggests, are tiny little sleeps that occur when we are sleep deprived. They last from as little as a millisecond to a few seconds.

Microsleeps are caused by fatigue, sleep apnoea or narcolepsy and are potentially very dangerous as they can occur at any time, even when driving! You may have seen the Traffic Accident Commission advertisements on freeways urging drivers to pull over and have a power nap if they feel sleepy. When people experience a microsleep, they may close their eyes, not respond to information, not have any recall of the past couple of minutes or may experience body jerks. You can avoid the potential dangers of microsleeps by getting a good night's sleep, avoiding caffeine before bedtime and not operating heavy machinery or driving when fatigued.

Lifestyle causes of sleep deprivation

Lifestyle factors can also contribute significantly to sleep deprivation. These factors include work (particularly shift work) and the use of electronics before bedtime. Shift workers (those who work outside usual 9 am to 5 pm hours) are 14 per cent more likely than regular workers to experience insomnia and 12 per cent more likely to experience excessive daytime sleepiness. These symptoms are experienced because of the desynchronisation between regular circadian sleep rhythms and the external world. Shift workers can reduce the effects of sleep deprivation by trying to stay on the same rotation for as long as possible to allow their body to adjust, by eating healthily and exercising, and by avoiding bright light on the way home from their shifts so that the pineal gland can produce melatonin and the onset of sleep can begin.

The effects of electronics use has become a big concern, especially as up to 70 per cent of teenagers report being sleep deprived because of their use of technology. The **blue light** that is emitted from devices such as smartphones and tablets disrupt the brain's release of melatonin and cause the onset of sleep to be delayed.

Blue light a range of the visible light spectrum, with a wavelength of 400–495 nm. It is frequently emitted by technologies such as smartphones and tablets.

Not only that, but having a smartphone or a computer in the bedroom means that we are more likely to be disturbed by messages and

notifications which can wake us up and cause sleep deprivation. A study by VicHealth (2018) found that teenagers who put their smartphones away one hour before bedtime slept, on average, an extra 21 minutes per night, or one hour and 45 minutes over the course of a school week. Try it – record your sleep quality and duration over the course of a week when you leave your phone outside the bedroom and switch it off an hour before bedtime. Do you think you will notice a difference?

Environmental causes of sleep deprivation

As well as biological and lifestyle factors, environmental factors also play a role in sleep deprivation. These factors include a poor sleep environment and too much external stimuli. **Sleep hygiene** is about developing good sleep practices that promote sleep. A good sleep environment is a key to a good night's sleep. This includes a comfortable bed and pillow, a comfortable temperature, no loud external noises, reduced lighting and no electronics. Other good practices to adopt are not consuming caffeine or alcohol in the hours before bedtime, exercising earlier in the day and eating at least two hours before bedtime.

Sleep hygiene developing good sleep practices that promote sleep.

Consequences of sleep deprivation

What are the real consequences of sleep deprivation? And how much does sleep actually matter? Alongside the significant financial costs mentioned earlier in this chapter, sleep deprivation can have very real long-term consequences for our health and wellbeing. People who have experienced long-term sleep deprivation are more likely to suffer significant physical health problems, such as heart disease, cancer, dementia, weight gain and a reduced immune system. When we don't get enough sleep, we experience a reduction in the speed of our reaction times, which can have significant impacts in a work or study environment and when we are driving. Sleep deprivation also affects our cognitive abilities. When we don't get enough sleep, we have problems processing information, we find it more difficult to make decisions, and we have trouble committing information to memory and then retrieving that information efficiently. We also experience changes to our emotional states – we can be upset more easily, become moodier, more short-tempered or more sensitive. As you can see, not getting enough sleep can have major consequences on all aspects of our health.

Figure 5.6 Good sleep hygiene practices are essential for a restful night's sleep. These include reducing electronic use and using bed just as a place for sleep.



It is not very ethical to deprive people of sleep for long periods of time because of all the reasons mentioned above; however, some people have volunteered to go without sleep for long periods so as to provide rich detail and information for researchers. These case studies give researchers valuable information that can be used to develop further research hypotheses.

In a famous stunt in 1959, DJ Peter Tripp stayed awake for 201 straight hours, which is over eight days without sleep. During this time, he experienced hallucinations, delirium and paranoia (he imagined that people were trying to drug his coffee to make him sleep!). In 1964, high school student Randy Gardner stayed awake for 11 days straight. Amazingly, he did this without the assistance of any stimulants such as coffee. Like Tripp, he experienced hallucinations, delusions and reduced cognition and memory.

TV shows have attempted to set records for the longest time without sleep. In a British reality TV show, *Shattered*, aired in 2004, competitors had to stay awake for the course of a week. They completed challenges along the way, with the winner collecting almost 1000 British pounds. Contestants reported feeling tired, emotionally stretched, fragile and jet-lagged; however, after a couple of nights of good sleep, they returned to normal (Kale, 2018).

Beauty sleep?

A Swedish study asked observers to rate pictures of people who were sleep deprived after a night of normal sleep compared to 31 hours of sleep deprivation (Sundelin et al., 2013). It was found that images of sleep-deprived individuals were rated as having more hanging eyelids, redder and more swollen eyes, darker under-eye circles, more wrinkles and fine lines, and droopier corners of the mouth. They were also described as looking 'sadder' than individuals who were not sleep deprived.

How much sleep do we really need?

The amount of sleep that we need changes across the lifespan. Newborn infants need significantly more sleep than adults and older people.

Age	Amount of sleep (hours across a 24-hour period)
Newborn infants 0–2 weeks	16–18
Babies 14–15 weeks	14–15
Young children 3–5 years	10–12
Teenagers	9–10
Adults	7–9
Older people	6–7

Table 5.2 Sleep requirements across the lifespan

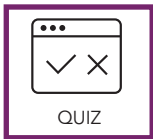
Typically, the younger you are, the more sleep you need. This is because sleep helps us grow and develop. The average requirements of sleep across the lifespan can be seen in Table 5.2.

Some research has suggested that there is a genetic reason why some people are able to function perfectly normally on much less sleep than average. Researchers have identified that people with a mutation of the gene known as DEC2 averaged only 6.5 hours of sleep per night, compared to people with no mutation, who averaged 8.06 hours. This provided researchers with evidence for the idea that short sleep times can be genetic (Hirano et al., 2018). In 2019, a new genetic mutation, on the gene known as ADBR1, was identified (Cell Press, 2019). Research suggests that people with these protein mutations have brains that are easier to wake and that stay awake longer. Interestingly, people who are natural short sleepers tend to be more optimistic, more energetic and better multitaskers than their regular sleeper counterparts. They also don't experience jet lag, have higher pain thresholds and may even live longer! However, most people do not have this mutation and so getting an adequate amount of sleep remains very important.

Activity 5.2

Sleep deprivation

- 1 Summarise each of the different causes of sleep deprivation:
 - a Biological
 - b Lifestyle
 - c Environmental



Review 5.3

Sleep deprivation

- 1 Define sleep deprivation.
- 2 Explain the role of melatonin in sleep.
- 3 Identify all the poor sleep practices that you can. Suggest ways that these can be minimised or altered to improve sleep quality and quantity.
- 4 Table 5.2 indicates that as we get older, our need for sleep reduces. Outline two reasons why this might be.

5.4

Technology and sleep

We have discussed how technology use in the bedroom can reduce both the amount and the quality of sleep, but there are many technological advancements that claim to enhance sleep quality. These include apps to help track sleep, smartphone functions, smart watches and smart sleepwear. But do they actually work?

A quick search reveals hundreds of apps to help us track sleep, monitor sleep quality and to help induce sleep. Indeed, some reports suggest that downloads of sleep trackers increased by 20 per cent during 2018–19 (Landau, 2019).

The evidence of their efficacy is still preliminary, but some experts say they work because they increase people's awareness of their sleep patterns, which makes them more likely to seek professional help if they need it. However, a 2018 review (Choi et al., 2018) found that very few of these apps actually scored above average in terms of their quality, content and functionality and that the technology they utilised (sensors in the smart device) were not on par with the data that is collected through polysomnography. Some sleep apps are described in Table 5.3.

Technology type	What it does	How does it work?
Sleep tracker	Helps to monitor aspects of sleep such as time of sleep onset, amount of time spent in REM/non-REM and total amount of sleep.	Sensors track movement through a device called an accelerometer. This is known as actigraphy. It is based on the premise that periods of inactivity indicate sleep.
Sleep cycle alarm clock	This technology monitors sleep and sets an alarm to wake you when you are in the lightest stage of sleep so that you wake feeling most rested. It can also advise when it is the best time to fall asleep depending on how many hours you require.	Sensors detect sound and movement to determine stages of sleep and then you set an alarm to wake you when you are in the lightest stage of sleep.
Sleep sounds	This is the use of technology to promote a more comfortable sleep environment and may include white noise or calming music or voices to help induce sleep.	The brain actively craves and creates stimulation, which can sometimes interfere with sleep. Sounds such as white noise, which offer a constant hum or drone, tamper with this and dampen the other stimulation. Pink noise contains all the frequencies available to humans and sounds like leaves rustling in the trees. It has been associated with more slow-wave sleep (deep sleep).

Table 5.3 Sleep technology

What will the future of sleep monitoring look like? Well, researchers have developed smart pyjamas as a way to monitor sleep behaviour from the comfort of your own home! Developed in 2019, the smart clothes have inbuilt sensors

that detect breathing, heart rate and movement and they can be washed like a normal garment. The data is sent via Bluetooth and can be used to monitor sleep behaviour and develop patterns of sleep over time.



Figure 5.7 Listening to repetitive sounds, such as pink noise, has been found to help improve sleep quality, especially deep sleep.

Activity 5.3

Sleep technology

- 1 Research sleep technologies and add what you find to the list in Table 5.3. Identify any technologies that you use and assess whether they are effective.
- 2 As a class, debate the pros and cons of sleep technology using the information about blue light and sleep technologies that claim to promote sleep.

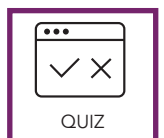
Review 5.4

Technology and sleep

- 1 Explain why sleep trackers work, despite the limited scientific evidence for their usefulness.
- 2 Mix and match activity – match the sleep technology to its correct definition.

a Sleep tracker	i The use of white noise or calming music or ambient sounds to reduce brain stimulation.
b Sleep cycle alarm clock	ii Uses an accelerometer to monitor many aspects of sleep.
c Sleep sounds	iii Uses sensors to detect movement and wake the user during a light stage of sleep.

- 3 Describe the features of smart clothes and explain how they can be used to enhance sleep.



QUIZ

5.5

Dreams

An integral part of sleep is dreaming. Dreams are the stories that our minds create while we are asleep and can consist of images, sounds and, rarely, smells and tastes. Dreams can make us feel happy or sad and are often the topic of conversation the next day. But what does the brain do when we dream? Why do we dream?

What happens to our brain when we dream?

Most dreaming (80 per cent) occurs when we are in the REM stage of sleep. During REM sleep, the sleeper experiences high-frequency, low-amplitude waves that are called sawtooth waves, indicating that there is a high level of brain activity. Also, during REM sleep, the sleeper's eyes move quickly back and forth behind their eyelids, hence the name, 'rapid eye movement'. Dreaming can also occur in non-REM sleep, but it is not as vivid or memorable as dreams that occur in REM sleep. Cycles of REM sleep become longer as the night progresses and occur more closely together, which explains why we often wake up from a dream. Newborn infants spend about 50 per cent of their total sleep time in REM sleep, but this drops to about 20 per cent of total sleep time from adolescence onwards.

Why do we dream?

Philosophers and ancient scholars were fascinated by dreams and believed they may have been prophetic (predicted the future). Esteemed psychologists such as Sigmund Freud and Carl Jung believed dreams gave us an insight into our unconscious and subconscious minds (the parts of our mind that are not immediately apparent and lurk below the surface of our conscious awareness). There are many theories about why we dream, but most recent research seems to suggest that dreams serve as an important part of our survival because they enable us to learn

and adapt to the world. One such theory is the threat simulation theory.

The **threat simulation theory** was proposed by Finnish psychologist Antti Revonsuo. It is an evolutionary theory, and states that dreaming allows the individual to replicate or practise real-life threats, which enhance survival and, therefore, reproduction of the human species (Revonsuo, 2001). Evidence for this is that our dream content usually contains more threatening events than we encounter in real life and that the dreamer usually problem-solves or deals effectively with the threat during the course of the dream, thereby practising it for 'real life'.

Threat simulation theory proposes that dreams prepare us for facing threatening situations in real life by allowing us to rehearse them in our dreams.



Figure 5.8 Nightmares could be a way of preparing us for threatening situations in real life.

Did you know?

Lucid dreaming occurs when the dreamer is able to control the content of their dreams, such as the people and places in them, and the direction of their dreams, such as the storyline or events. Lucid dreaming can possibly be used to reduce nightmares and scary or unpleasant dreams. Although a majority of people report having experienced a lucid dream, only around 20 per cent experience them regularly (every month). To know if you are experiencing a lucid dream, you can do a reality test in your dream such as looking at your reflection in a mirror – if it is different or distorted, then you are dreaming. You can attempt lucid dreaming by setting your alarm for around five hours after you fall asleep. When you wake and go back to sleep you will be more likely to go into REM sleep, which is when most dreaming occurs.

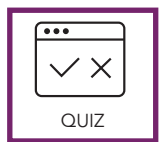
Further evidence for this comes from the fact that during REM sleep the body is immobile, which some psychologists suggest is practice for the freeze aspect of the fight-flight-freeze response. Moreover, when analysing the content of children's dreams, researchers found that children who experienced significant trauma (from war) had more dreams overall and more dreams with threatening content than children who had not experienced trauma, suggesting that their dreams allowed them to effectively perceive the threat and then avoid the threat in real life. It does seem that dreams help us consolidate and strengthen our memories and information that we have learned throughout the day. When faced with a heavy day of learning, people will spend more time in REM sleep that night. It is thought that REM sleep helps strengthen the neural pathways involved in consolidating and storing information. Some studies that compared the anagram-solving abilities of people who were allowed to enter REM sleep with those who were deprived of REM sleep found that those who were allowed the REM sleep performed up to 35 per cent better on the problem (Walker et al., 2002). This suggests that it is REM sleep,

and not just sleep, that allows for the problem-solving to occur. When people are deprived of REM sleep, they experience **REM rebound**. This is the increased amount of time spent in REM following a period of REM deprivation.

REM rebound the increased amount of time spent in REM following a period of REM deprivation.

The future of our dreams – visual decoding

Scientists can now map the content of our dreams by studying brain activity while we are asleep. A team of Japanese researchers looked at the patterns of brain wave activity of sleepers and then compared them with waking responses to visual stimuli (Horikawa et al., 2013). They found that the visual content of dreams is processed similarly to content when the person is awake and, consequently, they were able to predict the contents of a person's dreams by looking at their brain activity patterns. Using brain activity patterns, the sleepers' reported dream content, and lexical (word) and visual (images) databases, they were able to then look at the same patterns of occurrence when the person was asleep and accurately predict the contents of the person's dreams. They also found that, because dream decoding was most accurate in the tens of seconds just before waking, dream recall when awake seems to be based on short-term memory. It is interesting to note that this research was based on people in light stages (1–2) of sleep, rather than REM, when most dreams occur. This was because they were able to get more accurate reports from the sleepers in the light stages. They hope to extend this research to REM sleep.



Review 5.5

Dreams

- 1 Describe the type of brain waves that are experienced during REM sleep. Ensure you refer to frequency and amplitude in your response.
- 2 Explain the evidence that supports the threat simulation theory of dreaming.
- 3 What was one major limitation of the visual decoding research on dream content predictions?

5.6

End-of-chapter test



Multiple-choice questions

- The sleep-wake cycle is controlled by a structure in the brain named the _____, which secretes _____.
 - pons; serotonin
 - cerebellum; dopamine
 - pineal gland; melatonin
 - forebrain; acetylcholine
- The sleep-wake cycle operates on a _____ rhythm, whereas the sleep cycle operates on a _____ rhythm.
 - circadian; ultradian
 - ultradian; circadian
 - infradian; ultradian
 - infradian; circadian
- It is difficult for researchers to conduct sleep deprivation studies because:
 - It is difficult to keep participants awake for long periods of time
 - The people who sleep the most are too young to take part in such experiments
 - It is unethical to keep participants awake for extended periods of time
 - Everyone's sleep cycle is different, so it would be impossible to make the experiment reliable and valid
- All of the following statements are true except for:
 - About 80 per cent of our sleep time occurs in REM sleep.
 - About 5 per cent of the population will experience restless leg syndrome at some point in their lives.
 - About 70 per cent of Australian teenagers are sleep deprived.
 - Shift workers are 14 per cent more likely than non-shift workers to experience insomnia.
- REM rebound:
 - Occurs after a heavy game of basketball
 - Occurs when we have not received adequate amounts of REM sleep
 - Has not been empirically proven but is thought to exist
 - Occurs when we spend too much time in REM sleep

Short-answer questions

- Construct a table such as the one below and summarise the different causes of sleep deprivation. Indicate if you have experienced sleep deprivation due to this cause.

Cause of sleep deprivation	Description	Examples	Have I experienced this before?
Biological			
Lifestyle			
Environmental			

- 2 Construct a healthy sleep-hygiene routine for the average Australian adolescent, aged 15 years old.
- 3 Research another two sleep theories. Compare these theories with the threat simulation theory and decide which is the more probable.
- 4 Summarise the sleep cycle across a typical night. Ensure you refer to each stage of sleep and the common characteristics of each stage.

Extended-response question

Aki is a 16-year-old student. She is finding that she is increasingly tired throughout the day as she is not getting enough sleep at night. She doesn't start to feel sleepy until 11 pm and when she finally does fall asleep, after being on her phone for a couple of hours in bed, she wakes after a few hours. She is drinking approximately four cups of coffee a day to help her stay awake during school and to help her focus.

Describe and explain the factors that are contributing to Aki's poor sleep. In your response, refer to the biological, environmental and lifestyle factors that are contributing to her sleep deprivation. Explain the consequences of Aki's sleep deprivation, how much sleep she should be getting and how she can improve her sleep.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.

Figure 5.9 REM sleep may improve the neural pathways that help us remember and consolidate our memories and the information we've learned that day.



Chapter 6

Pursuing happiness

‘Happiness is when what you think,
what you say, and what you do
are in harmony.’

— Mahatma Gandhi



Are you happy? Like, really happy? What does that even mean? For most of us, happiness is a desired state, one that we aim for and one which, sometimes, can seem elusive and difficult to achieve. But can we achieve happiness? And if so, what does that look like? **Happiness** is generally defined as having a sense of pleasure with, and satisfaction in, one's life and a sense of purpose and connectedness. It is a sense of wellbeing. Pursuing happiness is important because increased happiness is linked to increased health outcomes, longevity, educational outcomes and success. This chapter looks at what happiness and wellbeing is, and how we can take practical, evidence-based steps to attain a greater sense of happiness and wellbeing within our lives.

Happiness a sense of pleasure and satisfaction with one's life and a sense of purpose and connectedness. It is sometimes also referred to as wellbeing.

6.1

Happiness around the world

Does happiness look the same everywhere? Do all people seek happiness in the same way we do? Who are the happiest people and why? As well as measuring economic indicators, such as a country's GDP (Gross Domestic Product) and GNI (Gross National Income), there has recently been a shift to measure the happiness and wellbeing of a country's inhabitants. In 2021, the United Nations (UN) developed a new policy that urged its members to measure the happiness of their people and then use this data to guide their policies, much like they would with financial information. Bhutan, a Buddhist country located south of Tibet, formally adopted the GNH (Gross National Happiness) in their national constitution as an alternative to the GDP as its measure of success in 2008, with the goal of achieving collective happiness for all. In 2019, New Zealand, under Prime Minister Jacinda Ardern, formally dropped using GDP as the main measure of economic success; instead it has adopted a broader approach that aims to enhance the wellbeing of the nation (Ellsmoor, 2019).

The World Happiness Report, issued by the UN, is based on the Cantril Ladder method.

Did you know?

Did you know that listening to music can make you happier? Some studies found that listening to upbeat music can increase positive moods. This is because the brain's reward system is activated.

Selected participants are asked to imagine a ladder with 10 rungs, with rung 10 being the best possible life for them and zero (0) being the worst. Participants then rate their own lives on that scale. The data collected from this survey is measured against other factors: real GDP per capita, social support, healthy life expectancy, freedom to make choices, generosity and perceptions of corruption. Finland was the happiest country in the world in 2018 and again in 2019, 2020 and 2021 (see Table 6.1).

The 2019 report measured not only the happiness of the country but also the happiness of its immigrants. Why have Finland and the other Nordic countries consistently held the top positions over the years? It seems that all of those countries place a high value on the factors that the model measures against.



Figure 6.1 Many people play and listen to music to lift their mood.

ISBN 978-1-108-86983-6

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Ranking	Country
1	Finland
2	Denmark
3	Switzerland
4	Iceland
5	Netherlands
6	Norway
7	Sweden
8	Luxembourg
9	New Zealand
10	Austria

Table 6.1 2021 list of the world's top 10 happiest countries

Source: Sustainable Development Solutions Network (2021)

So, where does Australia fit in the world rankings? Just outside of the top 10, at number 12 (in 2021); Australia was at its highest in 2016 when it was ranked at number nine. Why do you think that is? What factors may have influenced this slip in the ratings?

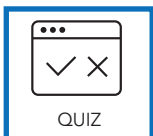
What factors seem to matter most?

When looking at the happiest countries, they are generally more developed, and so money, or financial security, seems to play a significant role – but only up to a point. People from emerging and developing nations prioritise health and education as being most important for life satisfaction and people who are ‘actively religious’ are more likely to describe themselves as ‘very happy’ than those who are not actively religious.

Activity 6.1

Mapping happiness

On a blank map like the one below, identify and shade the top 10 happiest countries according to the 2021 UN World Happiness Report (Table 6.1). Describe their locations and any trends.



Review 6.1

Happiness around the world

- 1 Define happiness.
- 2 Evaluate the use of GNH as a measure of a country's wellbeing.
- 3 Describe the Cantril Ladder method.

6.2 Positive psychology

Before **positive psychology** was formalised as a discipline by Martin Seligman (discussed later in this section), there were other psychologists who were actively interested in human happiness. This field of psychology is known as **humanistic psychology** and two well-known humanists are Carl Rogers and Abraham Maslow. Humanistic psychology proposes that all humans have the potential for good and are driven by a will towards health and growth, or self-actualisation (where we reach our full potential).

Positive psychology the domain of psychology that specialises in helping people improve their sense of wellbeing and happiness.

Humanistic psychology proposes that all humans are driven by a desire to grow and reach actualisation.

Carl Rogers was revolutionary as he was one of the first people to insist that mental wellbeing was not just the absence of a disorder, but rather that the individual could work to becoming a 'fully functioning person'. His person-centred approach to therapy considered mindfulness, acceptance and compassion, all things that we now associate with positive psychology.

Maslow's hierarchy of needs

Abraham Maslow was the first person to use the term 'positive psychology', back in 1954 when he gave the chapter of one of his books the title 'Moving towards a positive psychology'. Similarly frustrated by the focus on the negative aspects of humanity, Maslow developed the hierarchy of needs, which is still used widely today. Maslow's hierarchy of needs is represented as a pyramid (Figure 6.2), with the most important and biologically necessary

needs at the bottom. These are the physiological requirements that we have for survival, such as food, water, sex and sleep; all of the things that ensure our survival and, thus, the survival of our species. If these most base needs are not met in some way, we cannot attain the needs above them.

Above these needs are our 'safety' requirements; the things that make us feel safe and secure, such as stable health, financial security and physical safety. If these needs are met, then we are able to develop relationships and build a sense of love and belonging with our friends and family. Knowing that we are loved and loving others increases our sense of esteem or worth and develops our confidence.

Finally, if all of these needs are met and are met consistently, then we have the capacity to reach self-actualisation.

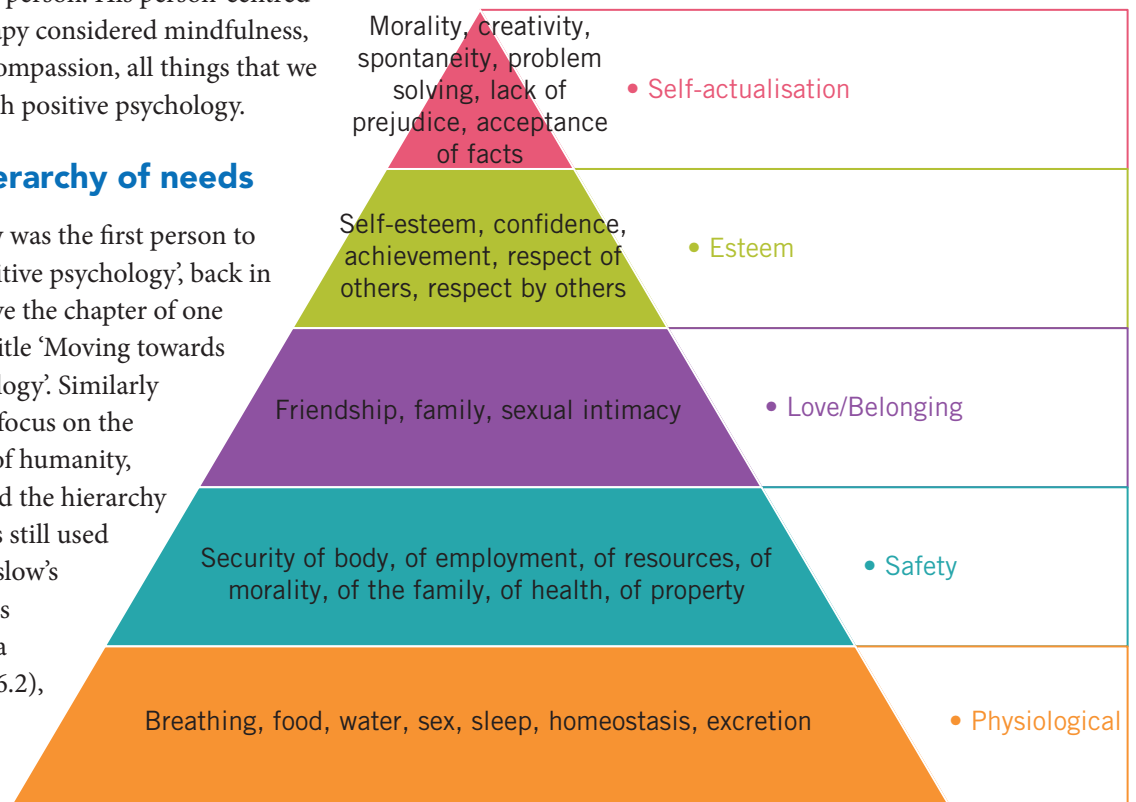


Figure 6.2 Maslow's hierarchic theory of needs

To this end, we are considered ‘fulfilled’ and are able to engage in creativity and spontaneity, and do so with openness and a lack of prejudice. We become the very best versions of ourselves and have the desire to keep striving to become even better.

Maslow argued that not *all* needs had to be met at each stage; they could be partially attained in order to work towards the next and so we could indeed pursue all five needs simultaneously. He also contended that because it is not easy to attain the needs of all levels, it can be quite difficult to actually reach one’s potential. Further, some people just aren’t motivated enough to become self-actualised despite having their primary needs met.

Positive psychology and Martin Seligman

Positive psychology as we know it today sprang to prominence in the late 1990s when its founder, Dr Martin Seligman (1942–), became president of the American Psychological Association (APA). It was officially recognised in 2000. Positive psychology is the scientific study of the positive aspects of the human experience that make life worth living.

Positive psychologists aim to determine and increase human strengths, leadership, creativity and happiness. Seligman developed the domain of positive psychology after realising that lots of aspects of psychology, particularly clinical psychology, focused on the negative experiences of the human condition and worked from a ‘deficit model’. A deficit model assumes that dysfunction and distress cause a level of deficiency in an individual whereas a positive model works to identify strengths and build on those.



Figure 6.3 American psychologist Martin Seligman, the founder of positive psychology

Activity 6.2

Psychologists

- 1 Two well-known humanists were Carl Rogers and Abraham Maslow. Working with a partner, identify and research two other influential humanist psychologists.
- 2 Discuss whether you agree with Maslow’s theory of needs. Identify someone you know who you consider to be self-actualised. Account for why you consider them to be this way. Identify the characteristics, traits or behaviours they demonstrate that make you believe this.

Positive psychology has many applications and is widely used in industry, large organisations and, increasingly, schools. Does your school use positive psychology? What does it look like in your classroom?

Learned helplessness

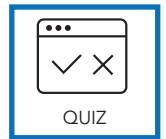
Seligman was born in New York and began his psychology career investigating depression. His early experiments on learned helplessness are now well-known. Seligman and his colleagues placed dogs in small boxes. Group 1 dogs were harnessed and then released, and Group 2 and 3 dogs were paired together. Group 2 dogs were given electric shocks, which they could stop by pressing a lever, and Group 3 dogs were given the same intensity shocks as Group 2 dogs but didn’t have a lever to stop the shock. Thus, Group 3 dogs thought the shock was inevitable and unavoidable. In the second part of the experiment, the same groups of dogs were put in a small open-topped container of two sides separated by a small barrier (which they could easily jump over). The dogs were shocked when they were in the first side and could have easily escaped the shocks by jumping over the barrier. Which groups of dogs do you think jumped over the barrier to escape the shocks? Dogs in Groups 1 and 2 learned very quickly that they could escape the shocks by jumping over the barrier.

The Group 3 dogs simply lay down and whined when they were shocked. They had ‘learned’ that they were unable to escape the shocks from the previous condition. For some people, it may be that depression is in part explained by a real or perceived absence of control over situations. Studies have found that people with a pessimistic (negative) explanatory style often experience depression and may be worse at problem-solving, too.

Review 6.2

Positive psychology

- 1 Define humanistic psychology and explain its relevance to psychology.
- 2 Maslow’s theory of needs is considered to be a hierarchy. Explain what a hierarchy is and why this theory is constructed like this.
- 3 Recall what Martin Seligman’s well-known early experiments were about.



6.3

What determines happiness?

Seligman contended that while we all have the capacity to be happy and to increase our happiness, we also have a **set point of happiness**; in part, some of our happiness levels are genetic (around 50 per cent). The remaining 50 per cent are factors that are partially within our control. Thus, he determined a formula for happiness. This section of the chapter investigates this formula, and also looks at the PERMA model (also developed by Seligman) as a way to increase our levels of happiness.

Set point of happiness personal level of happiness that is genetically determined and therefore unique and stable (unchanging) for each person.

Formula for happiness

Seligman proposed that happiness can be calculated thus:

$$\text{Happiness} = S + C + V$$

where S = set point

C = **circumstances** of life (e.g. race, sex, age, wealth, where you live)

V = **voluntary activities** (e.g. holidays, exercise, hobbies).

So, happiness is the sum total of our set point, our life circumstances and things that are more within our control.

Circumstances external life factors that contribute to 10 per cent of our overall happiness. They include things such as wealth, health and relationship status.

Voluntary activities activities that are intentional, that an individual chooses to do. These contribute around 40 per cent of our happiness.

Our set point of happiness

Every person has their own different set point of happiness. Our set point of happiness is thought to be relatively stable as it is genetic and, as shown in Figure 6.4, it contributes to around 50 per cent of our happiness. Seligman has likened this to our waistline – although we may eat a certain way, or exercise a lot or a little, we still have a set point that is genetically determined. Therefore, our set point tends to

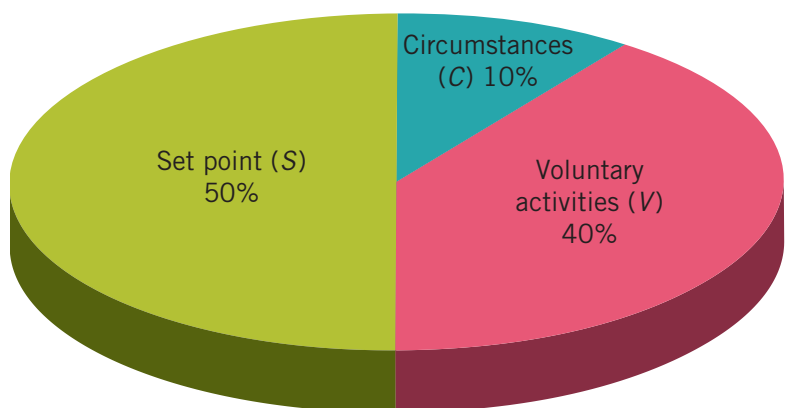


Figure 6.4 The three factors of happiness

remain the same throughout our lives. Research has found that some factors will shift our levels of happiness temporarily, but after a certain amount of time our levels will return to where they were originally. For example, people who win the lottery will experience an increase in happiness immediately after the win, but a few months down the track, their levels will return to what they were previously. It's the same with people who experience accidents that result in paraplegia. After the initial shock and disruption, despite the significant change in their life circumstances, they will generally return to the levels of happiness they had prior to the paraplegia. Given that we cannot alter our set point of happiness, we need to look at our circumstances and our voluntary activities to change our levels of happiness.

Circumstances of life

Our circumstances are believed to contribute about 10 per cent of our happiness and, although they only make up a small amount of our overall happiness, they are still important. Circumstances include where we live, our age, gender and **culture**. They can also include lifestyle features, such as our jobs, income (wealth), religion, health and marital status.

Culture the beliefs, values, practices and social behaviour of a particular group.

Voluntary activities

Voluntary activities, those aspects of our lives which we can control, contribute the remaining 40 per cent to our level of happiness. These are things that are intentional and that we choose to do. There are three types of voluntary activities: behavioural, cognitive and volitional.

Behavioural activities are activities that require us to act or do something. This could include exercising regularly, singing in a choir or reading a novel. **Cognitive activities** are our thoughts. Cognitive activities include optimistic thinking; that is, seeing the positive aspects of something, rather than the negative. Despite what we sometimes may think or believe, we do actually have the choice to think in a particular

way. One famous **longitudinal study** (Snowden, 1986) investigated the number of positive words that new, young nuns used in a letter they wrote upon their entry to the convent. The study found that nuns who used more positive words lived longer and had better health than nuns who used neutral or negative words. This was a useful study because the environment the nuns lived in was relatively stable in terms of eating habits, sleeping routines and so on, so it provided lots of reliable information for researchers. It also showed the relationship between positive thoughts and increased health and lifespan outcomes. **Volitional activities** involve working towards personal goals. Personal goals could include study goals such as attaining a 'B' grade average in Science, or a co-curricular goal such as achieving a belt level in martial arts.

Behavioural activities activities that require us to operate or act; a subtype of voluntary activities.

Cognitive activities activities that involve our thinking processes; a subtype of voluntary activities.

Longitudinal study a research investigation that involves the study of the same cohort over a sustained period of time (months or years).

Volitional activities activities that we choose or decide to take part in; a subtype of voluntary activities.

Did you know?

The amount of sleep we receive impacts our happiness greatly. One study on sleep-deprived tertiary students found they were more likely to remember negative ideas and phrases and less likely to remember positive ones (in Miller, 2006).

The importance of voluntary activities

Voluntary activities are important because they are the aspects of happiness over which we have the most control. Adaptation, that return to 'set point' we experience after a change in our circumstances, occurs less for voluntary activities than it does when we change our circumstances. This is because voluntary activities help us engage with and be active in the world.

For example, suppose a woman wins a significant monetary prize of \$100 000. She has changed her circumstance (C), so she may be happier than if she had not won the money. Eventually, she might return to her set point level of happiness, but if she engages in voluntary activities (V) she can prolong or increase her happiness. A cognitive activity could be focusing on her good fortune at receiving the money. A behavioural activity could be donating some of it to her favourite charity. A volitional activity could be establishing shared goals, such as setting up a trust fund for family members.

The PERMA model

In 2011 Seligman developed his PERMA model as a way to define just how to live a happy life. As previously discussed, the quest for happiness is an important pursuit because when we are happy, we are healthier, more successful and more engaged with the world. PERMA is an acronym:

P = positive emotions

E = engagement

R = relationships

M = meaning

A = accomplishments/achievements.

Unlike Maslow's hierarchy of needs, this model proposes that all of these elements work together and are equally important in



Figure 6.5 The PERMA model describes factors that can increase our happiness.

Source: <https://positivepsychology.com/perma-model>

contributing to our happiness. Let's look at all of these aspects individually.

Positive emotions

Positive emotions probably seem the most related to happiness. This is the ability to remain optimistic (positive rather than negative) and to view our past, present and future with positive emotions. We can be grateful about our past and we can choose to forgive anybody who may have hurt us. This is a way we can increase our positive emotions about our past. We can be mindful about our experiences in the present and we can increase our positive emotions about the future by being hopeful and optimistic. How do you build positive emotions into your life?

Engagement

Have you ever been so absorbed in an activity that you felt as if time stopped still and you were oblivious to the outside world? If so, then you may have experienced the highest form of engagement, a state which psychologists refer to as 'flow'. This is a positive state in which we are calm, focused and completely absorbed in what we are doing. Flow is achieved when

Activity 6.3

Happiness

- 1 Propose three examples each of circumstances and voluntary actions that could contribute to an individual's happiness.
- 2 Assess whether Seligman's formula would apply equally to people all over the world. Find some research that supports or refutes this.
- 3 Compare how a 15-year-old could apply the PERMA model in their life for increased wellbeing compared to a 65-year-old.



Figure 6.6 'Flow' is experienced when we are completely engaged with an activity.

we have the skill set that matches the activity perfectly, when we are pursuing a clear goal and we receive immediate feedback on our progress towards the goal. Flow can occur for lots of different activities, such as talking with someone, sports training, building a Lego set, reading, writing, running and so on.

Relationships

As well as positive emotions and engagement, for a really happy life we need to have meaningful relationships. These are connections with other people where we feel safe, secure, loved and valued. Relationships such as these can be with family, friends, romantic partners, co-workers and colleagues. They help us understand that we are part of a greater good and that we are valued for our contribution to the social group. Strong social connections help us when we are faced with times of difficulty and they help us develop resilience. Every experience that we have is amplified when we can share it with someone. From an evolutionary perspective, our survival is

enhanced if we stay in a group, so this is another reason why relationships are so important. Furthermore, when we engage in acts of kindness towards others, we experience an increased sense of wellbeing.

Meaning

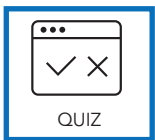
Meaning is the sense of purpose that we have about our lives and the fulfilment we derive from them. Having an increased sense of purpose can often come from belonging to, contributing to or believing in something bigger than one's self. This could be a religious group or church, a volunteer organisation or seeing the value in the study or work that we do every day. Where does your meaning come from?

Accomplishments/Achievements

Alongside all of the other factors of the PERMA model, we also set realistic goals for ourselves that we can achieve. The effort that goes into attaining these goals gives us a sense of achievement as well as the actual goal attainment. All of this leads to an increased sense of wellbeing. Often, we pursue these goals even if they don't lead to mastery or an increased sense of positive emotions or relationships.

Applying the PERMA model

How can you apply the PERMA model in your life? It's all well and good to have a model of how to be happy, but it needs to be useable. Seligman cautioned that each aspect of PERMA needs to be pursued in and of itself and not as a means to an end. Also, each aspect is defined and measured independently of the other aspects, so they are mutually exclusive. But you may find that they work together as well. For example, if you develop your relationships with your class peers, you may find greater meaning in your school life, which may help you achieve your goals and feel more accomplished.



Review 6.3

What determines happiness?

- 1 Recall Seligman's formula for happiness in full detail.
- 2 Identify three types of voluntary activities and provide an example of each.
- 3 Propose an example of how each aspect of the PERMA model could be met.

6.4

Positive psychology in action



As mentioned previously, positive psychology has many applications and has been beneficial in many schools and organisations. If a cohort of students or workers are happy and engaged, then they are more likely to be productive, so it makes sense to apply the principles of positive psychology. Two ways that positive psychology has been used in large organisations is through the identification and application of **character strengths** and through **mindfulness**.

Character strengths the sum total, or aggregate, of the characteristics that make us 'us'.

Mindfulness a mental state of being present and engaged in the moment, while being aware and accepting of our thoughts and feelings.

Character strengths

In 2004, Dr Chris Peterson, alongside Seligman, wrote a book that empirically identified 24 character traits. We all have these traits, in varying degrees, and it is these that make up our character, or the sum total of all our thoughts, feelings and behaviours. The traits that Peterson and Seligman identified are all able to be scientifically observed and measured.

The character strengths are organised in six core virtues which have a total of 24 character strengths. They can be seen in Table 6.2.



Figure 6.7 Seligman's 24 character strengths are used to help individuals reach their potential.

Virtues	Strengths
Wisdom and knowledge	Creativity, curiosity, judgement, love of learning, perspective
Courage	Bravery, persistence, honesty, zest
Humanity	Love, kindness, social intelligence
Justice	Teamwork, fairness, leadership
Temperance	Forgiveness, modesty, prudence, self-control
Transcendence	Appreciation of beauty, gratitude, hope, humour, spirituality

Research by Brdar, Anić and Rijavec (2011) on gender differences and character strengths found that women scored highest on the strengths of honesty, kindness, love, gratitude and fairness, while men scored highest on honesty, hope, humour, gratitude and curiosity. What do you think accounts for these differences? And what about age and character strengths? A 2006 study by Park and Peterson

found that young children are not really capable of demonstrating gratitude, open-mindedness, authenticity and forgiveness and that these traits develop with adolescence. Further, a secure attachment to the primary caregiver helps a young child develop love, zest and hope and it is these strengths that contribute most to their happiness at a young age.



Figure 6.8 Secure attachment between an infant and their caregiver is most important in developing the character strengths of love, hope and zest.

Positive psychology and mindfulness

Mindfulness is a word that is used a lot, but what does it actually mean? And what does it have to do with psychology? Mindfulness occurs when we are fully present in the moment, when we are aware of where we are, what we are doing and when we are not overly reactive to our environment. It is linked to positive psychology because many of its benefits are also the goals of positive psychology. These include reduced stress, greater overall health, more empathy, better relationships and increased positive mood and happiness. The good thing about mindfulness is that we already have the ability to do it. And if we don't actually practise mindfulness, there are still loads of activities and actions we can take to increase and improve our mindfulness.

Did you know?

Dopamine dressing is a real thing. Numerous studies have shown the correlation between colour and mood. Brighter colours, such as yellow, have a positive effect on our mood and darker shades such as grey and black lead to more sombre moods.

Mindfulness helps us reduce our stress and anxiety and can help improve working memory (short-term memory). A 2011 study (Van Vugt & Jha, 2011) found that when people practised mindfulness before a memory task, they were faster than the group that didn't receive any mindfulness training. This suggests that the mindfulness training helped with attention processes.

Activity 6.4

Understanding character strengths

- 1 Search for 'VIA character strengths' using an internet browser and take the survey to establish what your strengths are. Once you have done this, list your top 10 strengths and identify how you experience or demonstrate each of these in your daily life.
- 2 Use a thesaurus to find a synonym and antonym for each of the character strengths. Summarise these in a table like the one below.

Character strength	Synonym	Antonym

Mindfulness activities

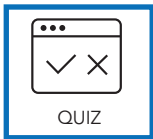
A quick search online reveals many different mindful activities for young people. Here are some that you might like to do in a psychology class.

- Mindful breathing:
 - Sit up comfortably in your chair and close your eyes.
 - Notice your breathing as you breathe in and out normally. Pay attention to it. Can you feel the air in your nostrils?
 - Attend to how your breath moves your body. Does your body move as you breathe?
 - Sit for a few minutes, just paying attention to your breathing. Do you feel more relaxed?
 - If your mind starts to wander, just direct your attention back to your breathing.
- Mindful words:
 - Think of a word that is calm or soothing to you. It could be an abstract word such as ‘hope’ or ‘love’, or it could be an object, such as ‘ocean’ or ‘sunray’.
 - Think the word and say it silently in your mind. Repeat this word silently with each breath you take in and out. Stay focused on the word.
 - If your mind wanders, bring your attention back to your word while you keep breathing.
 - Do this for a few minutes and, afterwards, notice how you feel.
- Starfish meditation:
 - Hold up your hand in front of you with fingers spread wide (like a starfish).
 - Gently trace up and down each finger with the opposite hand.
 - Focus on your breath at the same time.
- Body scan:
 - If there is space in your classroom, lie down somewhere you are comfortable; alternatively, sit upright in your chair.
 - Squeeze every muscle in your body as tight as you can at once.
 - Hold this for a few seconds and then release all your muscles and relax for a few minutes.
 - Make a note of how your body is feeling throughout this process.
- 5-4-3-2-1:
 - Take a deep breath.
 - Look around for *five* things that you can see and say them out loud using the sentence starter ‘I see ...’
 - Then, think of *four* things that you can feel and say them out loud using the sentence starter ‘I feel ...’
 - Listen for *three* things you can hear. Say them out loud using the sentence starter ‘I hear ...’
 - Say *two* things that you can smell. Say them out loud using the sentence starter ‘I smell ...’. If you can’t smell anything, then just say your two favourite smells.
 - Say *one* thing that you can taste. Say it out loud using the sentence starter ‘I taste ...’. If you can’t taste anything, then just say your favourite taste.

Activity 6.5

Practising mindfulness

- 1 How mindful are you? Search for ‘mindful attention awareness scale’ using an internet browser and take the short test from the Positive Psychology Center to find out how mindful you are in your daily life.
- 2 Research two more mindful activities and then, in pairs, share and practise them. Do you think you could implement these in your daily life?



Review 6.4

Positive psychology in action

- 1 The 24 character traits are able to be scientifically observed and measured. Explain what this means.
- 2 Define mindfulness.
- 3 Explain the link between mindfulness and positive psychology.
- 4 Describe some of the benefits of practising mindfulness.

6.5

End-of-chapter test



Multiple-choice questions



- 1 The Cantril Ladder method of measuring happiness is based on a scale of:
 - A It is impossible to measure happiness
 - B 0 to 10
 - C -5 to +5
 - D 0 to 5
- 2 Happiness can be represented as which of the following equations?
 - A Happiness = $S + C + V$
 - B Happiness = $S - C + V$
 - C Happiness = $C - V + S$
 - D Happiness = $C + V - S$
- 3 All of the following are aspects of the PERMA model except for:
 - A Positive emotion
 - B Engagement
 - C Responsibilities
 - D Meaning
- 4 How many character strengths are there?
 - A 22
 - B 24
 - C 26
 - D 28
- 5 When we are mindful, we are:
 - A Reacting to our surroundings and moving quickly
 - B Aware of our thoughts and feelings but we do not let them overwhelm us
 - C Engaging in two or more activities simultaneously
 - D Usually outdoors and with other people

Short-answer questions

Read the following scenario and then answer the questions: James likes to keep busy. When he is not at school, he plays soccer or hangs out with his mates. Lately, he has started a ninja class with his close friend. At school James is cheerful and open-minded and optimistic about his future. Sometimes James worries about getting his work in on time and meeting the demands of Year 10. James is rarely sick and he wants to become a human rights lawyer when he is older.

- 1 Identify the following factors from James' scenario: circumstances and voluntary activities (behavioural, cognitive and volitional).
- 2 What level of happiness do you think James experiences? Clearly justify your answer. You could suggest where James might place himself on the Cantril Ladder too.
- 3 Propose a mindfulness activity that James could do when he is feeling overwhelmed. Explain the benefit that this activity could have for James.

Extended-response question

One of your close friends has confided in you that they are not feeling very happy and they want to increase their positive emotions and general wellbeing. Although you are not qualified, they believe what you have studied in this course about positive psychology might be enough to give them some tips they can implement to help them. Write out a strategy for your friend, making sure that you refer to the hierarchy of needs, the PERMA model, character strengths and mindfulness.

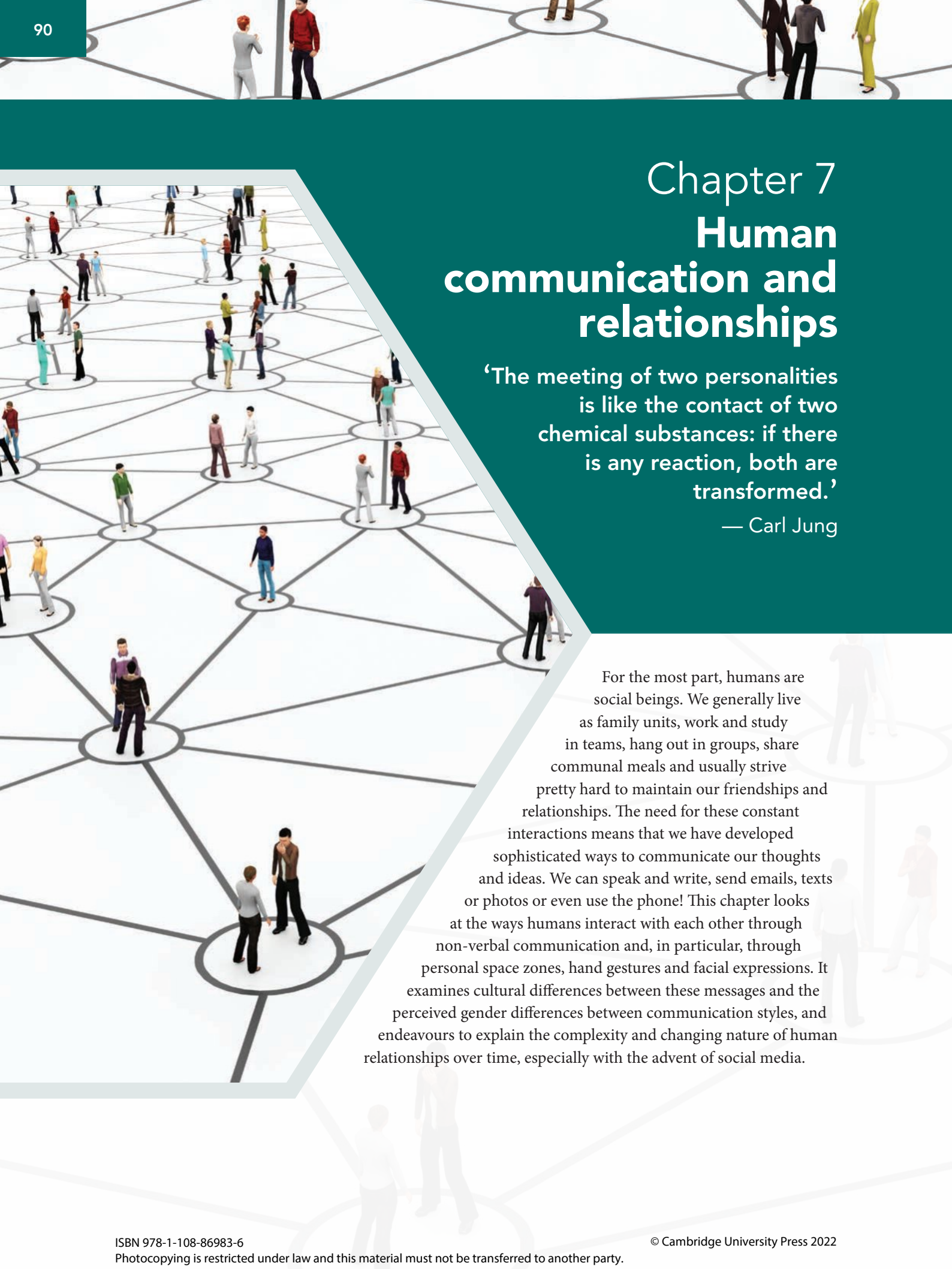
Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorchers Quiz
- Videos and other extra materials.

Figure 6.9 We should all take the time to pursue happiness in our life!





Chapter 7 Human communication and relationships

‘The meeting of two personalities is like the contact of two chemical substances: if there is any reaction, both are transformed.’

— Carl Jung

For the most part, humans are social beings. We generally live as family units, work and study in teams, hang out in groups, share communal meals and usually strive pretty hard to maintain our friendships and relationships. The need for these constant interactions means that we have developed sophisticated ways to communicate our thoughts and ideas. We can speak and write, send emails, texts or photos or even use the phone! This chapter looks at the ways humans interact with each other through non-verbal communication and, in particular, through personal space zones, hand gestures and facial expressions. It examines cultural differences between these messages and the perceived gender differences between communication styles, and endeavours to explain the complexity and changing nature of human relationships over time, especially with the advent of social media.

Over many thousands of years, humans have developed sophisticated ways to communicate their needs. While a lot of this communication is verbal or written, a vast majority of it is unspoken, relying instead on proximity, body language, gesture and facial expressions. For a long time, based on a methodology proposed by anthropologist Albert Mehrabian, it was accepted that only 7 per cent of the total messages we convey are from the words we

use. It was believed that 38 per cent was vocal (and dependent on tone of voice and so on) and that the majority of our communication was non-verbal, relying on our posture, gestures and facial expression (Mehrabian, 1971). While Mehrabian's methodology has been criticised since, experts do agree that non-verbal communication is a powerful form of communication – and that, indeed, actions speak louder than words.

7.1 Space invaders

Two important ways that we convey our needs are through our **territory** and through our **personal space**. Although both terms refer to the amount and type of space we need to feel comfortable, there are marked differences between them.

Territory the fixed spaces that somehow belong to us or a group to which we belong.

Personal space the amount of distance we need to maintain between ourselves and the people with whom we are interacting.

Have you ever experienced an invasion of your territory or space? Perhaps you were sitting in an almost empty cinema and someone came and sat in your row, or worse, next to you! This invasion probably made you feel uncomfortable and cornered and you may have made yourself smaller by tucking your legs in or turning your body away from the person. Was your territory being invaded? Or was it your personal space? Or both?

Figure 7.1 Territory and personal space set very important boundaries that shouldn't be crossed!



Territory – get out of my place

Human territoriality is of interest to researchers and psychologists. Territory refers to the fixed spaces that we, or a group that we belong to, claim as our own. An analysis of territory looks at ways in which we demonstrate this claim.

Territory is static and exists in the environment; that is, it doesn't move with us and exists externally to us. Psychologists help us to understand human behaviour by distinguishing between three different types of territory: primary, secondary and tertiary.

Primary territory is any area used *exclusively* by the individual or group. This is usually over a long period of time. Primary territory may include places like your bedroom (individual) or your house (group). **Secondary territory** is any space that is used regularly by the individual or group, but is also used often by other people. This may be your favourite lunch spot at school (group) or your usual seat in your English class (individual). **Tertiary territory** is sometimes called **public territory** because, as the name suggests, this is shared space designated for public use. An example of tertiary territory is a public park or a community library.

Primary territory any area that is used exclusively by an individual or group over a long period of time.

Secondary territory any area that is used regularly by an individual or group but is also used often by other people.

Tertiary territory (public territory) shared spaces that everyone has the right to use.



Many animals mark and defend their territory, and so do humans. **Delineation** is the term given to the way we mark our territories. Fortunately, unlike many animals, we do not do this by leaving our scent on items; instead, we use physical barriers. However, there are many animals that do this as well – think of a bower bird decorating its nest with blue items. Most commonly, we use physical barriers, such as a fence, a door or a sign, to show that something belongs to us. People who enter our territory need to announce their entry, probably through a knock on the door or by ringing the bell. If they don't, they will often arouse suspicion. If you're fortunate enough to have your own bedroom, then you may have decorated it in a way that demonstrates it belongs to you. You may have even put up a 'Do not enter' sign at some point. These are all examples of delineation and ways of signalling to others that they are entering your space.

Delineation the way we mark our territory to separate it from another's.

Psychologists have found that the more objects we use to delineate our territory, the more we convey ownership of it. Gang graffiti and tags demonstrate an area of turf control (Ley & Cybriwsky, 1974). More recent studies have found that geolocation games such as Pokémon GO, and check-in services such as Four Square, change the way people use and mark territory (Papangelis et al., 2017), indicating that a territory can be 'claimed' even in the virtual world. Research has found that 'male' markers, such as a coat or wallet, are more effective at defending territory than 'female' markers, such as a cardigan or purse; and that the 'female' markers are more likely to be moved than the 'male' markers (Nelson, 2014).

If we don't have any physical items handy to delineate our space, just touching an existing object can convey our ownership of that object, even if temporarily. For example, think about how you may touch your laptop as your teacher comes near to check your work. It's a signal to them that they shouldn't get too close! A classic



Figure 7.2 Would you sit here? We use our things to delineate our territory. Male objects are less likely to be moved than female objects.

study by psychologist Carol Werner investigated the idea of touch as a marker of territory by observing people playing Space Invaders in an arcade (Werner, Brown & Damron, 1981). A researcher either stood close to a Space Invaders machine or touched the machine, but not the controls. The psychologists found that new players were significantly less likely to approach the game when the researcher was touching it. This study is over 40 years old. Would the findings apply today?

There are two perspectives that psychologists use to try to understand territorial behaviour: the **socio-biological** perspective and the **socio-cognitive** perspective.

Socio-biological psychology a branch of psychology that tries to explain people's behaviour from an evolutionary perspective.

Socio-cognitive psychology a branch of psychology that tries to explain, and also provide information on, people's behaviour through the thoughts and ideas that accompany it.

It stands to reason that if many animal species demonstrate territorial behaviour as a way to control resources, then humans do too. This is known as the socio-biological perspective, meaning that our social behaviour springs from a biological drive. All animals need resources to provide food, water and shelter in order to breed and raise their young. If an animal can

establish and maintain their control over an area that has access to these resources, then there is a survival benefit and this will ensure the existence of the species. This theory is now criticised because, in our modern world, we are more global and do not exist within a small territory. For example, we live in one suburb, but may travel into another suburb to access the supermarket. Further, because many people are relatively well-off in countries such as Australia, when they are burgled, the initial concern is not whether the burglar invaded their kitchens and stole their food, but whether they took their jewellery or electronic goods. However, a supporting argument for this perspective is that territoriality is displayed by all cultures, suggesting some innate basis. Further, fighting over resources, and the territory in which they reside, is still the basis of many wars.

Socio-cognitive psychology argues that while territoriality in humans may have its origins in animal behaviour, we have learned when and where to apply it. This branch of psychology proposes that humans like everything to be ordered and neat. We like to simplify everything to make sense of an ever-changing world and we do this by constructing mental models that help us understand and predict how we act. If we control our primary territory, we can predict what is likely to happen there; we also have more control over who enters it. Territory, according to this perspective, also gives us information about another person's status and personality. If you decorate your bedroom wall with posters of musicians, you are sending a clear message to all who enter about your style, interests and beliefs. But what happens if we can't control our territory as much as we'd like?

Recently, many big corporations have made the move to flexible office arrangements, ranging from open-plan offices to hot-desking (where people do not have a designated desk, but find one that's available on any given day). A large study of over 1000 employees conducted by Morrison and Macky (2017) found that as office spaces became increasingly shared, demands

on workers increased. They felt less supported by their supervisors and they experienced no improvement in their co-worker relationships. These impacts have consequences for work quality and productivity.

Proxemics – get out of my space

Unlike territory, which is static, personal space is the area around us that we need to have in order to feel comfortable and non-threatened. It is dynamic – that is, it moves with us – and the amount we need also changes depending on who we are interacting with. The study of personal space is called **proxemics**, suggesting an investigation of the proximity we maintain when interacting socially with someone else. We try to maintain a balance between being overly familiar and encroaching, and awkwardly distant and disengaged.

Proxemics the study of personal space rules.

Psychologist Edward Hall, the founder of the study of proxemics, suggested there are four different **personal space zones** with which we engage. These are *intimate distance*, *casual-personal distance*, *social-consultative distance* and *public distance*.

Personal space zones the areas of space around us that we try to maintain: intimate distance, casual-personal distance, social-consultative distance and public distance.

The intimate distance zone is 0 to 45 centimetres and is reserved for people with whom we share a very close relationship. This could be a parent's hug or a romantic kiss. Sometimes we have to let strangers into this zone, as is often the case with doctors, dentists and hairdressers. The casual-personal distance zone is the space we maintain when engaging in conversation with a friend; this ranges from 45 to 120 centimetres. The social-consultative distance zone is 1.2 to 3.6 metres and is used when talking with a stranger or in meetings, for example. Finally, the public distance zone is maintained when we give a speech or lecture to a group of people. You might have noticed how students avoid the front row of a classroom for this very reason, as it impinges on that public

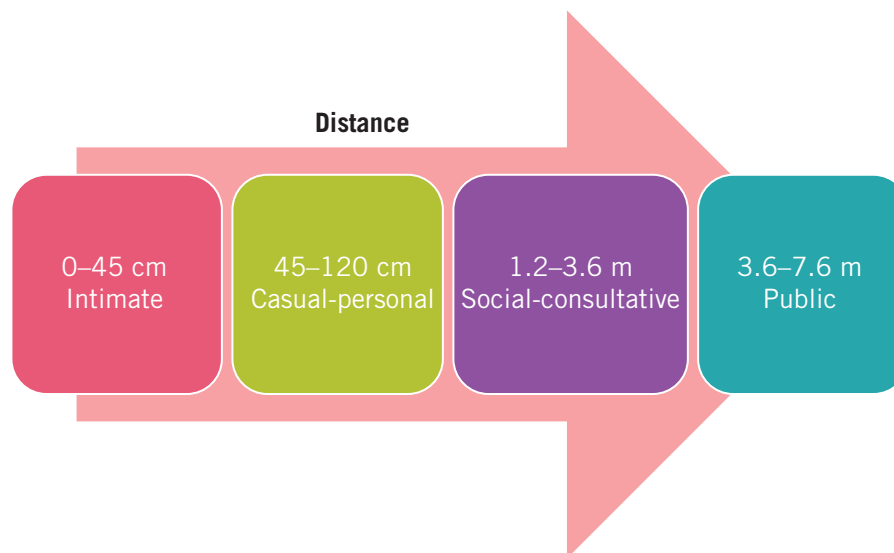


Figure 7.3 Personal spaces for social interaction

distance space. This zone keeps us the furthest from those with whom we are interacting, at 3.6 to 7.6 metres away.

The amount of personal space we require depends partly on individual culture and societal rules; recently, a study has shown that it can be predicted by gender and age. The study of almost 9000 people from 42 countries showed that social distance also could be predicted by temperature (Sorokowska et al., 2017). The higher the annual average temperature of a country, the closer the preferred distance to strangers. For casual distance, older people preferred greater distance, as did women. Intimate distance is also predicted by age and temperature, with older people preferring more distance from their loved ones. The higher the annual average temperature of a country, the greater was the preferred personal distance to a close person. This is the reverse of the interpersonal distance.

People in non-contact cultures, such as in the United States, the United Kingdom and parts of Europe, generally require more personal space than people from Mediterranean and Latin American cultures, and more than men in Middle Eastern cultures (Rosenbaum, 2018).

Women from all countries require more personal space than men. Typically, people from rural areas require more space than people from urban areas. However, psychologists are beginning to believe that these rules might be very deeply ingrained and that we replicate them in other contexts. For example, the world was changed in 2020 by the COVID-19 global pandemic, when people everywhere were urged to maintain a social distance of 1.5 metres to ensure safety and to 'stop the spread' of the coronavirus. It will be interesting to see the effect this has on personal space requirements in the future.

Many researchers are interested in seeing whether our increasingly virtual world mirrors the social rules we have in the real world. Findings seem to indicate that they are similar. A 2007 study of the game *Second Life* found that the avatars protected their personal space the same way that people do in the real world. This study also found that avatars maintained the same type of eye contact as people do in the real world (Friedman, Steed & Slater, 2007). A more recent study found that gender and age differences that are present in the real world were replicated in the virtual reality space (Iachini et al., 2016).

Activity 7.1**Territory**

- 1 Identify five ways that you delineate your territory. Assess how effective each one is on a scale of 1–5. You may like to use the example of your desk at school or your bedroom.
- 2 Propose an explanation as to why we defend our territory.
- 3 With a partner, discuss and describe the study of personal space.

What happens when our personal space is invaded?

Unlike when our territory is invaded, when our personal space is threatened we tend to retreat and increase the distance between ourselves and the other person. We may even experience a moment of panic, which can activate our **autonomic nervous system** and our **fight-flight-freeze response**.

Autonomic nervous system a subdivision of the peripheral nervous system that contains the sympathetic and parasympathetic nervous system.

Fight-flight-freeze response physiological response to threat or intense excitement; causes the release of adrenaline in the body.

Alongside many other changes, when our autonomic nervous system is activated our bladder constricts, resulting in decreased production of urine. It also takes longer for the onset of urine. An unusual study investigated urine production in relation to the invasion of personal space (Middlemist, Knowles & Matter, 1976). Researchers conducted the study in a male public toilet that had three urinals and a cubicle. They waited until a participant entered and began using a urinal. A **confederate** would then position themselves either at the adjacent (closest) urinal or at the one furthest away (moderate distance), and time the onset and duration of urination. In the control condition, the participants were left undisturbed. As was predicted, when the confederate was right next to the participant, their average time to onset urination increased and their duration of urination decreased, suggesting that the invasion of personal space leads to an increase in anxiety levels. A more recent study has

noted that when men have higher levels of the hormone testosterone (in the test it was applied in a gel), they are more likely to reduce the public distance (that is, they get closer) to an angry man, woman or dog (Wagels et al., 2017). This suggests that there are other factors that influence our personal space preferences as well.

Confederate a person who is part of the experiment and pretends to be a participant but is there to fulfil a specific role within the experiment. The true participants are unaware that the confederate is part of the research team.

This increase in anxiety levels when our space is invaded can be completely normal, or it can escalate to a more severe problem, such as developing shy-bladder syndrome or **paruresis**, resulting in an individual trying to avoid all circumstances where they might have to use a public toilet. In severe cases, the fear can develop into an anxiety disorder such as agoraphobia. **Agoraphobia** is the irrational fear of public or open spaces, causing sufferers to avoid being in settings where they feel out of control. This may lead them to avoid people too.

Paruresis the irrational fear of using a public toilet to urinate.

Agoraphobia the irrational fear of public or open spaces.

Evidently, our interpretation of invasions of our personal space generally depends on the context. For example, we accept our space being invaded in some circumstances, such as during a popular concert, but it is very uncomfortable if a stranger sits next to us in an uncrowded movie theatre. As the studies mentioned suggest, other factors such as culture, age and gender also affect our level of comfort with space invaders.



Figure 7.4 When we are in a crowded elevator, we will avert eye contact at all costs by looking at our phones or looking up, as a way to create more space around us.

7.2

Gestures: it's all in the hands

There are well over 100 000 words in the English language, and the average person has a vocabulary of 30 000 to 60 000 words; 3000 of these will adequately cover 95 per cent of what they need to communicate in writing and 1000 will cover 89 per cent of everyday writing – those words that we use most often (Dexter, n.d.). Yet humans have many more non-verbal communication cues and symbols at their disposal. Some estimates even range to 750 000 non-verbal symbols! This vast number of gestures means that we can convey many things for which we may not have the words, adding to the richness of our communication. One way we do this is through the use of hand gestures.

Did you know?

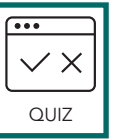
We only speak, on average, about 16 000 words per day. At 150 words per minute, this equates to around 100 minutes a day.

Gestures are any hand, wrist or finger movement used to communicate. Groups of gestures are called clusters and they always need

Review 7.1

Space invaders

- 1 Describe who we are likely to allow into our intimate distance zone.
- 2 Explain from an evolutionary perspective why we might let these people in. Now explain this from a socio-cultural perspective.
- 3 Identify the independent and dependent variables in Middlemist and colleagues' 1976 study.



to be read together because, on their own, they can be misinterpreted. For example, someone rubbing their nose may not necessarily be lying; they may just have an itchy nose!

Gesture any movement of the forearm, hand, wrist or finger used for communication.

Gestures are different from sign languages in that they support the spoken word, as opposed to a sign language which is itself a language with its own unique rules of grammar and syntax. Gestures can be created with one hand, such as the 'thumbs up' signal, or with both hands, such as the 'prayer hands' gesture. Gestures can also use other parts of the body, such as the 'shush' gesture, where we bring the pointer finger up to our pursed lips.

Using gestures adds richness and nuance to our communication, but there is also a biological reason why we use gestures. Our hands and fingers have more nerve connections to the brain than almost any other part of the body, meaning they can produce small and dexterous movements. If we redesigned the human body so that it was proportionate to the amount of



Figure 7.5 The creature in the diagram is called a sensory homunculus. Note its disproportionately large hands, lips and tongue. All of these parts are essential for communication and, therefore, our survival.

cortical space (brain space) allocated to each part of the body, we would look something like the **homunculus** shown in Figure 7.5.

Homunculus Latin for 'little human'; a representation of a person used to illustrate the proportions of cortical space allocated to each body part.

Psychologists believe that spoken language not only evolved from gesture but also that gesture is innate. Studies of primates, such as bonobos and chimpanzees, have shown that they employ over 80 gestures as well as 18 facial or vocal signals, and that although their facial signals are the same, the same gestures are used in many different contexts, both between and within species. In a recent study, researchers observed that toddlers aged between 12 and 24 months used 52 discrete gestures to communicate, such as clapping, shaking their heads and raising their arms. The researchers also observed chimps and found that they used 46 of the same gestures, an overlap of 90 per cent (Daley, 2018). People who are congenitally blind (from birth) also gesture when they speak, despite never having seen

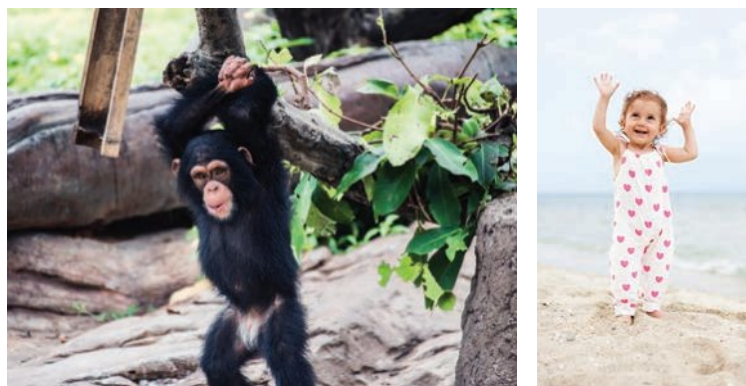


Figure 7.6 Chimps and human toddlers share a large number of gestures.

a gesture (Iverson & Goldin-Meadow, 1998). Researchers believe that human gestures evolved to become more facial (moving our mouths, lips and tongue), and therefore vocal, and less manual (hand movements), so that we could use our hands for other activities such as carrying and making tools.

Today, gestures allow us to communicate in instances when vocalising isn't appropriate, perhaps during an important speech or when a baby is asleep. They are often used to indicate our emotional state or to signal turn-taking, an important social skill. Think about what it is like communicating with someone who uses very few gestures. Do you feel that they are not engaged?

Hand gestures also help us remember information. Researchers have found that they amplify the impact of spoken words. People recall more of what is said if the speaker communicates with *relevant* gestures. In a 2003 study, New Zealand psychologists Cross and Franz asked 120 college students to view three blocks of 27 video clips of a woman saying phrases like 'peel the banana' and 'the square box' (in Bower, 2003). There were three conditions in this study: the speaker used gestures that *matched* the content; the speaker used gestures that *did not match* the content; or the speaker used *no* gestures at all. The volunteers had to name as many phrases as they could remember after each block.

The psychologists found that people were able to recall more phrases that were spoken with relevant gestures than when there were no gestures. Recall was worst when the phrase was accompanied by an irrelevant gesture. More recent studies also suggest that learning algebra can be improved by using gestures (by almost 60 per cent more than speech-alone learning). Yet another recent study demonstrated that when students use gestures to help with maths problems, they used fewer eye movements (saccades), suggesting that gestures help compensate for poor visual working memory capacity (Pouw et al., 2016).

Activity 7.2

Gestures

- 1 Research and identify an example where a gesture could be taken out of context and explain how this might happen.
- 2 Construct five phrases that could be used in an experiment that replicates Cross and Franz's 2003 experiment, other than 'the square box' and 'peel the banana'. Combine these phrases with the class responses and conduct the experiment yourself. Assess whether memory is improved with the addition of the gestures.
- 3 Research and construct a list of some other common gestures. List alternative meanings for them. Discuss whether they are the same in other countries.

Activity 7.3

Talking without gestures

In groups of three, take turns to talk about what you know about gestures. Do this first without using your hands – sit on them if you have to! And then do it using your hands naturally. Have one person be the observer and note down similarities and differences in what you say and the types of gestures you use.

Cross-cultural differences in gestures

Just as verbal languages are different around the world, so too are gestures. This adds to the richness of the global community, but it does mean that overseas travellers should educate themselves on what gestures mean in other countries so that they don't do something that is, at best, embarrassing and, at worst, illegal. For example, raising your middle finger to another driver in England could see you hit with a one thousand pound fine! There are many gestures that mean different things in Australia compared to other countries. For example, the 'thumbs up' gesture is ubiquitous in Australia as a way to demonstrate that everything is 'okay' and 'going well'. However, in different contexts and countries, this seemingly simple gesture can mean different things. When water-skiing, it means 'go faster' and when scuba diving, it means 'ascend'. In Greece, it can mean 'get lost' and elsewhere in Europe it can indicate either the number one or the number five.

Activity 7.4

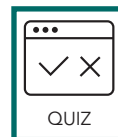
Famous gestures

Many world leaders and prominent individuals are renowned for their enthusiastic and/or inappropriate gestures. Identify some examples of these and share them with your class. YouTube may have some useful examples.

Review 7.2

Gestures: it's all in the hands

- 1 Recall the name given to groups of gestures and explain why it is important that gestures are interpreted together.
- 2 Recall how many discrete gestures to communicate were used by toddlers aged between 12 and 24 months according to a recent study.
- 3 Describe how gestures are different from sign languages.



QUIZ

7.3

Putting it all together: human relationships

We use non-verbal signals as well as language to communicate because humans are generally social and rely on each other for a number of survival needs. If Maslow's hierarchy of needs is considered carefully (take another look at Figure 6.2 in Chapter 6), then we rely on other people for at least three or four of the five needs. This means we need to communicate carefully with those around us. This section of the chapter looks at how we develop some very different types of relationships: friendships, romantic relationships and online relationships. This section also looks at people who choose to live reclusively and avoid human interaction.

Friendship

With the advent of social networking sites, such as Facebook and Instagram, it seems as though everyone has hundreds of friends at their disposal. The average Australian Facebook user aged between 18–29 years of age has 394 friends, whereas Facebook users aged 65 and over have, on average, 68 friends (Statista, 2019). And yet you probably do not meet most of your social media contacts on a daily basis. What constitutes a friend? Is it someone you see every day? Is it someone you can share your deep, dark secrets with? Or is it a bunch of mates who like to get together and have a good time?

Did you know?

In 2014, photographer Tanja Hollander set out to visit all 626 of her Facebook friends in real life. The journey took her five years during which she visited four continents, 12 countries, 34 states and over 400 homes!

Friendly interactions develop early in life. Recent research suggests that peer pressure can begin as young as nine months old, with babies

craving attention and interaction with each other (Bradley & Selby, 2003) and that infants as young as one year old will attempt to soothe a person in distress (Hoffman, 2001, in Wynn et al., 2017). Young toddlers will actively help an adult struggling to complete a task (Warneken & Tomasello, 2006). All of this research suggests that humans are innately social and want to help and be accepted by their peers.

Interestingly, differences in communication style are exhibited by the different sexes from a very early age. Female babies only a few hours old are attracted to human faces and maintain eye contact two to three times longer than male babies. Male babies are attracted to objects. All babies spend longer looking at attractive faces than non-attractive faces. And a 2008 study by Quinn and colleagues showed that babies even prefer looking at attractive cats more than non-attractive cats! At 12 weeks old, girls are able to identify pictures of family over strangers, whereas boys are not. Preschool-age girls remember more about people and their emotions, whereas preschool-age boys remember more about objects and their shapes.



Figure 7.7 Female babies are more attracted to human faces and maintain eye contact longer than male babies.

These differences in communication styles from an early age shape the way we communicate with our friends in later life. It is suggested that the reason boys and girls develop different speech styles is because single-sex groups interact in different ways. Boys tend to play in larger hierarchical groups whereas girls play in smaller groups. Girls' talk is more collaborative, whereas boys' talk is more competitive (Coates, 2015). This supports the findings of Haas (1979) that women tend to talk about relationships and feelings with their friends, discussing personal issues such as marriage, children, shopping and their other friendships. These are topics that encourage vulnerability and, therefore, intimacy. Men, on the other hand, tend to talk about sports, money and business. They are also more likely to tease and provoke each other to the point of embarrassment as a way to develop intimacy. It's a way of demonstrating that they like a person well enough to include them in a personal joke.

Activity 7.5

Friendships

- 1 Discuss with a partner if you have noticed any gender differences in the playing behaviour of children who are of kindergarten age. Describe these differences and suggest reasons as to why they occur.
- 2 Create a list of any other gender differences you have noticed between communication styles of people your own age. Do you think there are now more differences or fewer than when some of these studies were conducted? Why do you think this is? What does this say about our understanding of gender?
- 3 Construct a recipe for creating and maintaining friendships over time.

How do you know when you're embarrassed? Do you blush? Do you look down? Or do you smile awkwardly? About 25 per cent of people will touch their faces when they're

embarrassed. Although embarrassment can be an unpleasant feeling, it is a powerful emotion, or expression, because it works as a social apology. For a lot of male social groups, it signals acceptance into the group.

Another way we encourage our social relationships is through 'mirroring'. This is where we incidentally copy or mimic the actions of those around us. For example, we may adopt the same stance as someone we are standing and talking with. Some researchers believe that this is, in part, due to specialised neurons (nerve cells) in our brains called **mirror neurons** that are involved both in physical actions and in the observations of actions. When we watch an action, mirror neurons fire and activate the regions of the brain that would be involved if we performed the action ourselves.

Mirror neurons specialised neurons in the brain that fire when someone performs an action but also when they view that action being performed by someone else.

This mirroring behaviour makes us feel at ease, demonstrates that we are non-threatening and builds rapport. It has also been suggested that mirroring behaviour enables better cooperation, which leads to more, and better, resources, such as food, medicine and shelter. Interestingly, a woman is four times more likely to mirror another woman than a man is to mirror another man. Why do you think this is? Can you explain it from an evolutionary perspective? Mirror neurons may also explain why women are generally considered more perceptive than men at reading facial expressions. When shown short films with the sound turned off, women were able to read the situation accurately 87 per cent of the time, whereas men only read it correctly 42 per cent of the time. However, a study conducted at Penn State University found that men are equally as good at interpreting facial expressions (Swayne, 2017).

Sometimes friendships don't go as planned and may end up being one-sided, with one party being more invested in the relationship than the other. Sometimes, a 'friend' can actually turn into an enemy, or can be both at the same time.

The term ‘**frenemy**’ first appeared in print in the 1950s, so it is not a new term. It is used to describe someone with whom you have a friendship, but it’s not a healthy one. There are many types of frenemies, but the consistent theme is that their behaviour is damaging to the integrity of the relationship. This can be intentional or unintentional.

Frenemy a type of friend whose behaviours bring you down, whether this is intentional or not; or someone with whom you are friendly, but there is an underlying rivalry or competing interest to the friendship.

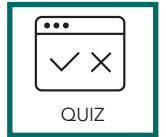
Frenemies may try to undermine you, compete with you, speak badly about you behind your back, consistently cancel dates or appointments with you, only talk about themselves, and only reach out when they want something from you. Have you experienced any of these behaviours? If so, experts suggest reducing contact with these people

because they do not make us feel good about ourselves. If you feel confident enough, you can talk to them about their behaviour, but try not to make it personal, and stick with the facts. It is also a good idea to limit the type of information you tell them so it can’t be used against you.

Review 7.3

Putting it all together: human relationships

- 1 Explain the function of embarrassment from an evolutionary perspective.
- 2 Define mirror neurons.
- 3 Describe the effect that social networking sites may have on communication in friendships. Ensure that you provide both positive and negative effects.



7.4 Romantic relationships

We subconsciously send out signals that tell people around us how we are feeling and what we are thinking, all without saying a word. But how do we send out and detect the signals that suggest that someone is interested in us romantically? Humans are incredibly adept at reading these signals, without even knowing they are doing so.

It’s all in the eyes

As well as our pupils dilating when we are interested in someone (and theirs dilating when they are interested in us), we also interpret the presence or absence of limbal rings. Limbal rings are the dark circles around the iris. They change depending on our health and our age. A 2018 study found that male targets with distinct limbal rings were perceived as healthier and more attractive by women than those without, suggesting that the identification of a potential short-term mate may be a very quick decision (Brown & Sacco, 2018).



Figure 7.8 Limbal rings around the irises are an indicator of attractiveness.

Flirting

Flirting is a way to indicate that our interest in someone may extend beyond normal friendship. Flirting can be described as the non-verbal signals that suggest we are ready to engage in some form of mutually enjoyable exchange with

Flirting non-verbal signals that suggest someone is ready to engage in an exchange with another person.

the other person. The key word here is mutual. If the attention is unwanted, then the exchange could become harassment: this is particularly relevant in light of the **#MeToo movement**. Typical flirting signals do differ between the genders. A 2018 study found that the top seven flirting behaviours for women were smiling, laughing, batting eyes, provocatively dancing, initiating kissing, touching and eye contact (Tisdale & Sheldon, 2018), although this study only looked at heterosexual couples, and the women observed were actors in well-known movies.

#MeToo movement a social movement against sexual abuse and harassment that aims to empower sexually assaulted individuals through empathy and solidarity by visually demonstrating how many people have experienced sexual assault. The term was first coined in 2006 by Tarana Burke.

Another recent study (Punyanunt-Carter & Wagner, 2018) looked at the reasons that individuals flirt through texting compared with face-to-face. They found that women flirted for pleasure more than men and that men were more likely to flirt for control and for relaxation. Men, more than women, also flirted face-to-face for escape reasons. Interestingly, both men and women were more likely to flirt for pleasure if they were in a committed relationship. Psychologist Arthur Aron claims that flirting is a way for married people to ‘test the value’ of their spouse, as if checking whether there is an alternative possibility to their partner that might be better (Luscombe, 2008). Evolutionary psychologists would argue that, from a biological perspective, this makes sense. Flirting can be a way to enhance social interactions, provided it is fun for all.

Kissing

Kissing is a non-verbal gesture that signals our interest in someone, or it may be used as a greeting. However, unlike facial expressions, the custom of kissing is different in many countries. A recent analysis suggests that only half of all cultures kiss lip to lip. People in Western countries tend to kiss on the lips for romance

and on the cheeks for a greeting. It is common for people in Vietnam and Thailand to rub noses with their lover, while in Siberia, India and the South Pacific nose rubbing is used as a greeting in some cultures. The ‘Malay kiss’, used by Māori people, Mongolians and Tongans, is a combination of nose rubbing and sniffing, and is the equivalent of the Western ‘French kiss’.

There is still no definitive explanation as to why people kiss, but there are many theories. Evolutionary psychologists believe it might be a remnant of the ancient ritual of a mother chewing food before feeding it to her offspring, in much the way that birds do. Bonobos and chimpanzees kiss as a way to reconcile. This is more common between male chimps than male-to-female, suggesting that kissing is not for the purpose of reproduction. Because humans have a relatively poor sense of smell, it might be that kissing is a way to get close enough to detect another’s pheromones. Sigmund Freud related it to breastfeeding as an infant. Christopher Nyrop, a nineteenth-century Danish scholar, proposed that kissing was a way to ‘taste’ the person, a symbolic attempt at recognition and affection; and Hindi Sanskrit writings of 3500 years ago depict kissing as a way to inhale the soul of another.

Activity 7.6

Flirting and kissing

- 1 The chapter identifies some flirting behaviours that are prevalent in women. Can you identify any that are prevalent in men? List them.
- 2 People flirt for fun, to escape and for control. Propose other reasons people may flirt.
- 3 Apart from bonobos and chimpanzees, are there any other animal species that kiss? Identify and describe these animals and propose reasons as to why they engage in this behaviour.

First comes love, then comes marriage – long-term commitment

If flirting rituals are successful, then a relationship may ensue. And from this relationship, perhaps a long-term commitment will be made in the form of a de facto relationship (where a couple live together on a genuine domestic basis) or a marriage. Relationships in Australia have changed over time. In the 1970s, only 16 per cent of couples lived together before they married (Australian Institute of Family Studies, 2021). Today, that figure sits at higher than 80 per cent. The average age of marriage has increased over that time too. In 1971, the median age for men to get married was 23.4 years old and for women it was 21.1 years. Flash forward to 2017 and the median age had increased to 30.4 for men and almost 29 for women. The 2017 data suggested that most people get married, but also found that in that year, 2.0 people per thousand of the population got divorced. These are crude figures, however, and not representative of the actual marriageable population. They also don't include same-sex marriages as these were only made legal in Australia in December 2017.

Regardless of whether or not people get married, most relationships do go through certain, predictable phases. These are lust, infatuation and attachment. **Lust** occurs in the

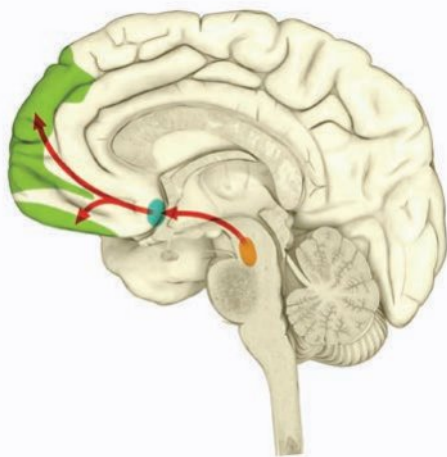


Figure 7.9 The VTA (in orange) is responsible for feelings and emotions related to love and physical attraction. It is a key component in the brain's reward pathway shown here.

early stages of a romantic relationship; couples flirt and demonstrate a range of non-verbal indicators for this. **Infatuation** is the second stage of a relationship; this is the stage where the focus is on our partner's good qualities, and we may think about them constantly and want to spend all our time with them. During this stage, the brain releases chemicals such as dopamine, the feel-good neurotransmitter; phenylethylamine, another neurotransmitter or neuromodulator that increases excitement and cognitive performance; and serotonin, a neurotransmitter that gives us a feeling of emotional stability. The part of the brain responsible for this is the ventral tegmental area (VTA) at the base of the brain. This stage of infatuation lasts, on average, six months.

Lust the first stage of romantic relationships, where couples are attracted to each other and flirt with each other.

Infatuation the second stage of romantic relationships, where couples tend to focus on the positive aspects of their partner and ignore those that don't fit with their expectations.

After infatuation, people often break up. If they don't, they will develop their relationship to the third stage: **attachment**. During this stage, a cooperative bond is formed between the couple. This is not only because of the time spent together, but also because of the brain chemistry involved. **Oxytocin** is a hormone that is produced by the hypothalamus and secreted by the pituitary gland. It is responsible for developing attachment, particularly between new mothers and their babies to help establish the bonding process. Other areas of the brain, such as the caudate nuclei located near the centre of the brain, are responsible for habit. It may just be that loving someone can be a hard habit to break!

Attachment the third stage of a romantic relationship where couples form a cooperative bond.

Oxytocin a hormone released that helps strengthen the bond between people.

Marriage and long-term relationships do appear to have many benefits. Married people have lower rates of suicide and mental health problems, and they live longer, perhaps in part because they are less likely to smoke or drink heavily. They are also less likely to experience stress, although people in established relationships tend to put on more weight than

single people despite eating more healthily. People who have children tend to increase weight even more. Obviously, the relationship needs to be a strong one in order to reap these benefits; research shows that the stress of a bad relationship can be very detrimental.



Relationships in the virtual world

There's no denying that the internet and social media have changed the ways we interact with people, for both good and bad. Two important considerations are: what happens when virtual relationships go wrong and how can you stay safe online?

Catfishing

Catfishing occurs when a person pretends to be someone else online with the purpose of luring another person into a relationship. These people will create false profiles, and research your interests and online presence intensely so they can relate to you. Although data on social catfishing scams are scant, the Australian Competition and Consumer Commission (ACCC) collects data on its Scamwatch page. In 2020, there were 3680 reports of romantic and dating scams, which totalled a loss of over \$37 million. Only 35 per cent of these reports, however, included any financial loss. Most reports were made by the 45–54 age group, with roughly an equal number of men and women reporting the scams (ACCC, 2021).

Personality types of catfishers

Research is beginning into the types of people who catfish online. A study of 27 self-identified catfishers found that 41 per cent were motivated

by loneliness, and around one-third were dissatisfied with their physical appearance, which was a contributing factor. Some used catfishing as a way to safely explore their gender identity and preferences, and 25 per cent said they did it for practical purposes, to access apps or online spaces for which they were otherwise too young. Consequently, they created a new online persona (Vanman, 2019).

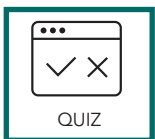
How to stay safe online

There are many ways to stay safe online, but the Office of the eSafety Commissioner (2021) suggests the following:

- Trust your instincts. If someone randomly makes contact, you have every right to be suspicious.
- If they know a lot about you, then this can also be a warning sign – it's too good to be true.
- Use Google reverse image to check their profile pictures. Is it a genuine photo or is it a stock image? Do they have lots of friends on their social media accounts? Are the accounts newly set up? If so, then they are probably fake accounts.
- Are they asking you to send pictures of yourself? Do not send pictures to anyone you are unsure about.
- Block and report any accounts that you are suspicious about.

Did you know?

Australian Idol 2004 competitor Casey Donovan was catfished for six years by her friend, who pretended to be a man named Campbell.



Review 7.4

Romantic relationships

- 1 Recall the reason in a 2018 study that some males were perceived as healthier and more attractive by women.
- 2 Identify what evolutionary psychologists believe is an explanation for why we kiss.
- 3 Define catfishing.

7.5 When it ends: grief and loss

Grief is the complex response we experience when we lose someone or something that is special or important to us, such as an unrequited love, a break-up with a significant other or the death of a family member. Grief is more than sadness; it can have emotional, physical, cognitive, behavioural and spiritual elements. Given the social nature of humans, we will all experience grief, in some form, at some point in our lives.

While feelings of heartbreak generally subside over time, they can result in a major depressive episode. Results from a study into the brain activity of nine women who were experiencing acute grief because of a relationship break-up showed there was an increase in activity levels in the parts of the brain, such as the cerebellum and brainstem, that are typically related to sadness. More interestingly, fMRI results from the same study showed a decreased level of activity in the left hemisphere, which is responsible for our logical and analytical thought processes (Najib et al., 2004). The more acute the women's grief, the greater the decrease in this activity.

What can I do to heal my broken heart?

There is a saying that 'time heals all wounds'. This may be true, but in the meantime, it may be useful to write your thoughts and feelings down on paper or in a journal. A literature review (Linde et al., 2017) found a small but promising positive impact for complex grief prevention for those who were experiencing grief because of loss through suicide. When participants wrote about their grief, they were less likely to experience complex grief. Other studies have found that people who wrote about a relationship break-up experienced fewer respiratory illnesses, less tension and less fatigue



Figure 7.10 Heartbreak and grief will subside over time but can lead to a major depressive episode. Writing about your experiences can help reduce the negative feelings of grief.

than participants who were in the control group and were required to write in a non-emotional way about impersonal relationship topics (Lepore & Greenberg, 2002).

Reclusive behaviour

While most people are social and enjoy the company of others, there are many who choose to avoid social interaction altogether. This behaviour ranges on a spectrum from people who feel uncomfortable in social situations to those who experience a mental disorder such as **avoidant personality disorder**. There are many reasons why people may choose to withdraw from social contact with others, such as traumatic experiences, money troubles, feelings of inadequacy, or mental illness. Some people choose to become reclusive, whereas others may not.

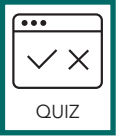
Avoidant personality disorder a personality disorder whereby people experience significant social anxiety and social inhibition. It may lead to people withdrawing from society.

While the benefits of strong social connection, such as good physical and mental health, are well established, and the harms that come from prolonged and acute social isolation are also well established, a recent study has shown that there are some benefits to reclusive behaviour as well. Creativity has been linked to social withdrawal because it can bring increased mental focus, and it can help consolidate memory and understanding others' emotions when you finally do reconnect. Like anything, too much isolation can be unhealthy. But so can too much social contact!

Review 7.5

When it ends: grief and loss

- 1 Nico has lost his wife of 40 years to cancer. He is feeling deep grief and loss. Identify some of the emotional, physical, cognitive, behavioural and spiritual behaviours he may experience.
- 2 Explain what happens to brain activity when we experience grief.
- 3 Identify some of the reasons why individuals may adopt reclusive behaviour.



7.6

End-of-chapter test



Multiple-choice questions

- 1 Any areas used exclusively by an individual or group over a period of time are referred to as _____, whereas a space that is available for public use is known as _____.
 - A primary territory; secondary territory
 - B primary territory; tertiary territory
 - C secondary territory; primary territory
 - D secondary territory; tertiary territory
- 2 You have a part-time job at a fast-food restaurant and when you work the drive-through, you stand about 1.5 metres from your customer. This distance is known as:
 - A Intimate distance
 - B Casual-personal distance
 - C Social-consultative distance
 - D Public distance
- 3 Groups of gestures are known as _____ and they should be interpreted in groups because _____.
 - A bunches; otherwise they could be more easily misinterpreted
 - B bunches; gestures always appear in groups
 - C clusters; gestures always appear in groups
 - D clusters; otherwise they could be more easily misinterpreted
- 4 Which of the following chemicals is not released during stages two and three of romantic relationships?
 - A Dopamine
 - B Phenylethylamine
 - C Glutamate
 - D Oxytocin



- 5 Catfishing occurs when:
- A Someone adopts a new online persona with the purpose of luring you into a relationship
 - B Someone pretends that you have won an overseas lottery and asks for your credit card details
 - C Someone befriends you in order to develop a sexual relationship with you
 - D Someone sets up a fake social media account under your name

Short-answer questions

- 1 Grief can be a very complex experience and can affect our *emotions, physical wellbeing, cognitions* and *sociability*. Identify how each of these aspects could be experienced.
- 2 Describe the three stages of attachment by writing a case study about a couple who have been married for 20 years.
- 3 Outline the benefits to, and the disadvantages of, withdrawing from society. Summarise these findings in a written paragraph.

Extended-response question

Jordan and Alex are interested in beginning a relationship. Using the information from this chapter, identify some of the stages of relationship development that they may engage in, from their initial meeting to an established relationship.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.

Figure 7.11 There are many verbal and non-verbal ways to communicate with the people around us.



Chapter 8

Forensic psychology

‘We’ve got to stop focusing solely on the symptoms of crime, and start caring about the causes as well.’

— Carrie P. Meek

As a person is led from the courtroom after being found guilty, the question that remains is: why did they do it? Was it due to their upbringing? Was it inevitable, given how they were treated as a child? Or was it due to their hormones, neurotransmitters or even their brain activity? Maybe there is a clue in their genes?

One of the challenges that faces psychology is that there are often multiple theories that can adequately explain a behaviour. In fact, a criticism sometimes made of psychology is that it is not really a science because it does not have one clear paradigm to explain a behaviour. To understand why someone has committed a crime, a **holistic approach** must be considered. When conducting a **case formulation**, it is important to acknowledge the complex and interrelated factors that are unique and significant to an individual.

Holistic approach in psychology, a whole range of biological, cognitive and social factors must be considered when trying to determine what might be causing a behaviour.

Case formulation a comprehensive analysis that builds a profile exploring why someone might have started and continued to engage in criminal behaviour.

8.1

Biological explanations of criminal behaviour

Several biological factors can contribute to criminal behaviour. This section focuses on how brain structures and hormones can influence our behaviour.

Brain structures

There are specific parts of the brain that can be considered to play a role in criminal behaviour.

Prefrontal lobe

As discussed in Chapter 1, certain areas of the brain are associated with specific functions. A healthy prefrontal lobe will be active when someone is controlling their impulses, making informed and logical decisions, or paying attention. For example, if someone has embezzled money from their workplace for several years, their prefrontal lobe is likely to be active and healthy, because they have needed to make several complex decisions in order to achieve and hide their crime. However, if the frontal lobe is underdeveloped or damaged, it can result in the person having difficulties thinking through the consequences of their actions and controlling their impulses. Therefore, they might be more likely to respond with violence, hurt someone when angry or agree to steal something when encouraged by a friend. This is because they may not think about the repercussions of their behaviour beforehand.

Amygdala

The amygdala is an integral part of the limbic system. There is one in each hemisphere and together the amygdalae are activated when we feel threatened. It regulates our emotions. If damaged, overactive or atypical in size, this part of the brain might be triggered more quickly in some people and activate the fight-flight-freeze response, leading to higher rates of aggression and less control over emotions. However, an underactive amygdala could explain why a

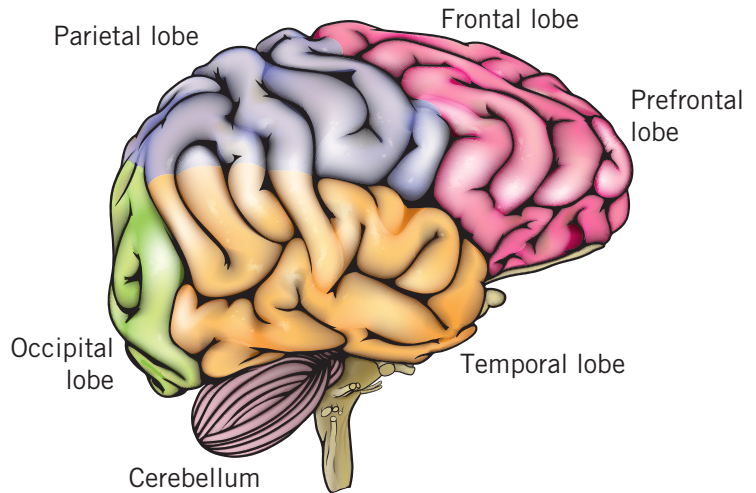


Figure 8.1 Underdevelopment or damage in certain areas of the brain can affect a person's decision-making.

person assessed as a psychopath tends to have difficulties processing emotions and often lacks remorse or empathy.

Did you know?

Researchers have found that there is a greater proportion of people in jail with acquired brain injury than exists in the general population.

The field of neurocriminology

A pioneer in **neurocriminology**, Adrian Raine, wanted to investigate whether the brains of murderers who were pleading not guilty due to reasons of insanity were different from those of non-murderers. He examined the brains of 41 murderers and 41 non-murderers using a **positron emission tomography (PET) scan**.

Neurocriminology uses neuroscience methodologies such as brain imaging techniques to understand and explore how the nervous system can explain criminal behaviour.

Positron-emission tomography (PET) scan a functional brain imaging technique that indicates the activity level of areas in the brain. Red and yellow indicate high activity, while purple and blue indicate less activity.

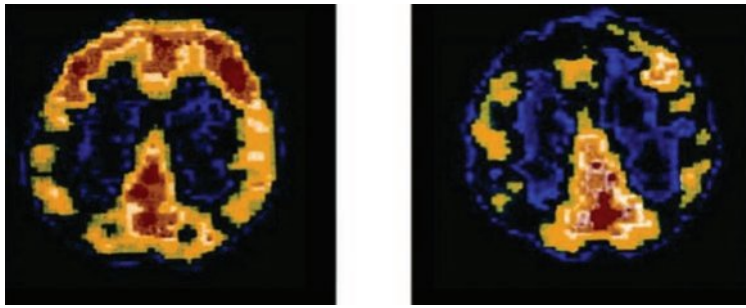


Figure 8.2 A PET scan showing reduced prefrontal functioning in murderers (right) compared with controls (left). Red and yellow indicate higher brain functioning.

This brain imaging technique allows for the brain to be observed when active. Raine found that the prefrontal lobes in murderers (39 males and two females) were less active than non-murderers (Raine, Buchsbaum & Lacasse, 1997). Additionally, there were asymmetries in the murderers' brains, with less activity seen in the amygdala in the left hemisphere compared with the right. Raine's research adds credibility to neurocriminological explanations for behaviour and has prompted discussions regarding the ethical and societal implications of appropriate treatment and interventions (Raine, 2016).

Activity 8.1

Criminal behaviour

- 1 Identify two crimes that might be committed if someone's prefrontal cortex or amygdalae indicate dysfunction. Explain your responses.
- 2 Identify the independent and dependent variables in Raine's research.
- 3 Propose a way to control for two confounding variables that could have impacted on Raine's research.
- 4 Discuss the ethical and societal implications of Raine's research.

Hormone explanation

In June 2020, there were approximately 40 000 people in Australian prisons, 92 per cent of whom were male (Australian Bureau of Statistics, 2020). Some researchers contend that this high proportion of men can be attributed to the male sex hormone, testosterone. Hormones

are chemical messengers that are secreted by glands in the endocrine system. They travel in the bloodstream. Testosterone is produced in the male's testes and in the female's ovaries. Typically, males produce more testosterone than females.

In the animal kingdom, testosterone is secreted when an animal needs to assert its dominance. This can be seen when a rival is threatening to take over an animal's territory, deny them access to a mate, endanger their offspring or prevent them from accessing food and shelter. It is not just in the animal kingdom where these behaviours are seen; they are evident in humans too.

In order for testosterone to be secreted into the bloodstream, the hypothalamus sends a signal to the pituitary gland in the brain to release gonadotrophic substances, one of which stimulates testosterone secretion. Some research shows that testosterone can then activate the amygdala and the fight-flight-freeze response. This overrides the ability of the prefrontal lobe to control impulsive behaviours and limits the ability of the person to make rational decisions. The hormone explanation might not be a compelling explanation for all crimes, but it could be considered when looking at violent and sexual offences.



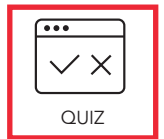
Figure 8.3 Animals secrete testosterone to help them assert dominance over their competitors.

Did you know?

Correlational research conducted by Dabbs and colleagues (1995) showed that prisoners who had committed sexual or violent crimes had higher testosterone levels than inmates who had committed crimes relating to theft and drugs.

Review 8.1**Biological explanations of criminal behaviour**

- 1 Recall if a prefrontal lobe is healthy or unhealthy when someone is controlling their impulses, making informed and logical decisions, or paying attention.
- 2 Recall if Adrian Raine found that the prefrontal lobes in murderers were less or more active than in non-murderers.
- 3 In September 2020, there were approximately 40 000 people in Australian prisons, 92 per cent of whom were male. Identify the hormone that some researchers contend is a reason for this.



8.2 Social explanations of criminal behaviour

While biological factors might make a person predisposed to engaging in criminal behaviour, there are several social factors that can trigger criminal behaviour too. Social explanations can be harder to investigate scientifically when compared with biological factors. They often rely upon self-reporting data and observational research to explore why the person committed the crime. Once the information has been collected, it can also be prone to interpretation bias by the experimenter when they are analysing the data. Also, criminals might not want to disclose information because of social desirability pressures.

Self-fulfilling prophecy

Have you ever been given a label? Maybe you've been told that you are 'kind', 'sporty', 'impulsive' or 'resilient'. Over time, if someone consistently labels you, and you begin to believe that you have the qualities associated with the label, then you

are likely to experience a **self-fulfilling prophecy** and demonstrate behaviours consistent with the label. Self-fulfilling prophecies can be positive, but they can also be negative. Negative labels could explain why some people engage in criminal behaviours.

Self-fulfilling prophecy occurs when a person internalises the labels that have been placed upon them and believes they are true. This then results in exhibiting behaviours that are consistent with the label.

An example of this is as follows: Brynn has often been told by his teachers that he is just like his brother: 'always disruptive, rude and never pays attention in class'. Brynn feels that his teachers pick on him after being told by the principal to watch him 'as his brother was also a troublemaker'. During a recent parent–teacher meeting at the school, his mother said that she was unsure why Brynn was still at school, as he is not smart and is probably going to end up in jail like his brother. Over time, Brynn has begun to internalise and believe these labels.



Figure 8.4 We can be given different labels by society that might not reflect who we really are.

He decides to vent his frustration by vandalising the school. This demonstrates a self-fulfilling prophecy.

This theory highlights how important it is to be aware of the labels that are placed upon us. We can internalise and believe these labels or we can choose to engage in a *self-defeating prophecy* and reject them.

Social learning theory

Social learning theory acknowledges that we learn by observing others who we consider to be our role models. Some crimes must be taught. For example, stealing a car would be difficult without being taught by someone who has expertise. Social learning theory consists of five stages and each is explained in the following example which refers to how Ella has learned to hack into a secure database from her sister, Ines.

Social learning theory proposes that new behaviours can be acquired by observing and imitating others.

- 1 **Attention:** Ella carefully watches and observes Ines as she shows her how to access the database and bypass firewalls.

- 2 **Retention:** Ella will then need to consolidate and remember how to do this. She will commit it to her long-term memory so that she can recall it when she needs to.
- 3 **Reproduction:** Ella must be physically and mentally able to complete the behaviour when the opportunity arises. Ella does not hack into the system yet, but during this stage it is assessed whether she has the physical and cognitive capacity to do so. Can she type quickly enough? Does she know how to navigate around the different firewalls?
- 4 **Motivation:** Like all behaviours, Ella needs an incentive and desire to perform the behaviour. She might be intrinsically motivated and wants to feel proud, or perhaps the motivation is from an external factor. She could receive money or praise from Ines.

After these stages, and when the opportunity arises, Ella will exhibit the behaviour as she has the skill set, ability and desire to hack into the computer system.

- 5 **Reinforcement:** In the final stage, Ella receives a reward for successfully completing the behaviour. Usually this reward is the element that was motivating her to complete the behaviour, such as praise from Ines.

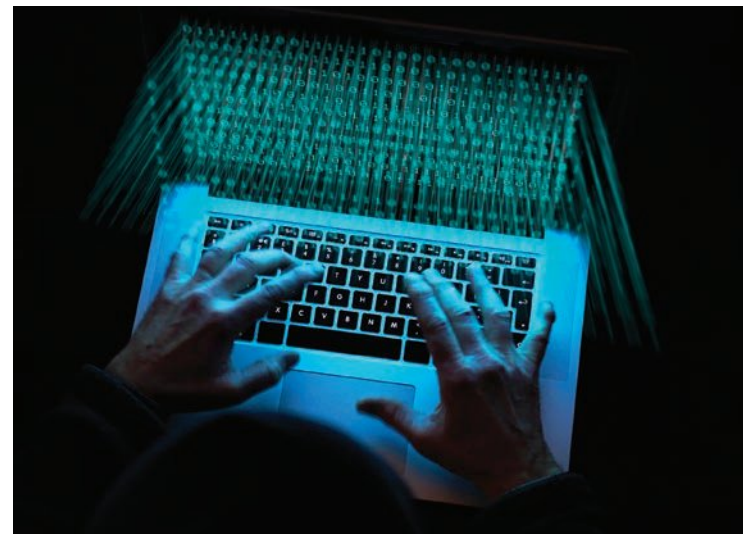


Figure 8.5 Ella would need to learn how to hack into a secure database by applying each stage of social learning theory.

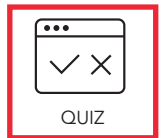
Activity 8.2**Understanding**

- 1 Think of a skill that you have recently learned. Using the five stages of the social learning theory, explain how you have learned this skill.
- 2 Account for how a self-fulfilling prophecy might explain why Ned Kelly (Australian bushranger) and his brother turned to a life of crime.

There are many other social and biological factors that can explain criminal behaviour. It is important to not be reductionist in our view of criminal behaviour, whereby we reduce a complex phenomenon such as a crime to an oversimplified explanation, attributing it to one, or only a few, factors. It is also important to provide tentative conclusions and consider each element as a risk factor that could increase the likelihood of someone engaging in a crime.

Review 8.2**Social explanations of criminal behaviour**

- 1 Define what a self-fulfilling prophecy is.
- 2 Recall what the social learning theory proposes about new behaviours.



8.3 How reliable is your memory?

Would you be a reliable eyewitness if you saw a crime? Without looking, draw the Australian \$100 note in as much detail as possible. Once you have finished, check the accuracy of your drawing.

In this situation, Nilesh experienced the weapon focus effect as he focused all his attention on the gun and, consequently, was unable to encode and store other important aspects, such as what the thief looked like.



Some people might have remembered that it was green, or that Dame Nellie Melba and Sir John Monash were represented, but most would be unable to recall specific details. Despite our memory not being very accurate, eyewitness testimonies are still readily used in court. This can be problematic, especially when a weapon was evident or if a leading question was used when asking the person to recall the crime.

Weapon focus effect

An example of the unreliability of an eyewitness testimony follows. Nilesh is working at a pharmacy when a person with a gun enters and demands money. When Nilesh was interviewed by police, he was unable to remember details about the person, but could provide specific details about the gun.



Figure 8.6 Nilesh is unlikely to remember much about the scene due to the weapon focus effect.

To understand why this happened, we need to explore how memory works. In order for us to survive threatening situations, we focus all our attention on the object that could hurt us. This can be problematic because information from our sensory memory must be paid attention to if it is to be transferred into short-term memory. Therefore, information about what the thief was wearing is unlikely to be transferred. However, if that kind of information is transferred, the next problem is that our short-term memory can only hold between five and nine items at any one time. This is a limited amount of information and often the consistently changing crime scene displaces important details. Finally, when talking to the police, memories of the event are retrieved from long-term memory. However, in order to be encoded into long-term memory, the information must be meaningfully rehearsed and encoded. The Yerkes-Dodson law states that if we are too stressed and over-aroused, we are less likely to 'perform' well, which in this case means that encoding material into long-term memory would be difficult. Therefore, the account of the event might not be accurate or complete.

Reducing the impact of the weapon focus effect

Pickel, Ross and Truelove (2006) taught some participants in their class about the weapon focus effect. During the lecture, a member of the research team ran into the classroom holding either a book or a gun. There was no difference in what the students were able to recall. However, those that did not learn about the weapon focus effect remembered fewer details and made more incorrect statements when the person was carrying a weapon rather than a book. This suggests that if we teach someone about the weapon focus effect, it can help them to refocus their awareness and consciously pay attention to, and encode, other important information in the scene.

Leading questions

Even if we can overcome the weapon focus effect, our memories are not free from bias. Loftus and Palmer (1974) demonstrated

how a leading question can influence the reconstruction of people's memory of a car accident. A leading question is a question that carries expectations and assumptions in the way it is constructed. For example, the question 'What colour was the man's weapon?' assumes that the person was male and that they were holding a weapon.

Activity 8.3

Leading questions

In small groups, propose some examples of leading questions and discuss why they are leading questions.

Loftus and Palmer wanted to see how susceptible memory was to being reconstructed. They showed 45 participants a series of videos depicting car accidents. They divided the participants into five groups and asked the same series of questions of each group, but in the critical question, 'About how fast were the cars going when they _____ into each other?'; they substituted the verb used to describe the accident. The results showed that the participants' mean estimate of speed was highest when cars were described as having 'smashed into' each other, followed by 'collided with', 'bumped', 'hit'



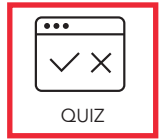
Figure 8.7 In TV courtroom scenes we often hear, 'Objection, your honour, leading the witness!' This happens when a lawyer asks a leading question of the witness. It influences the way they retrieve the information and can distort their memory.

and then ‘contacted’. This is concerning because it highlights how one word can influence and change the way we remember an event. That is why it is important for police to undergo extensive training to ensure that they don’t ask leading questions when interviewing witnesses.

Review 8.3

How reliable is your memory?

- 1 Outline two reasons why Loftus and Palmer’s research might be unethical.
- 2 Explain why it would be beneficial for employees in banks and service stations to learn about the weapon focus effect.



8.4 Factors that influence a jury

In order to make sense of our world, we use and rely upon our pre-existing schema. Schemas are mental frameworks that we have constructed, which, when activated, help us to make sense of, and respond to, the world around us. For example, when we hear a siren, the schema associated with the concept of a siren tells us that a police car might be trying to get through traffic and therefore we need to move out of the way to ensure that we and others remain safe. What schemas have you constructed to represent your ideas of school and the police?

Each person’s schemas are different; often they contain implicit or unconscious bias that might disadvantage people when they are acted upon. There are many factors that shape our schema, such as our upbringing, the media, past experiences, our parents and friends, and the list goes on. As such, it makes sense that multiple factors can influence our decisions if we are on a jury. The gender, race, age and level of attractiveness of the defendant, plaintiff, lawyers and the jury themselves are just some of the factors that can impact the decision-making process of a jury.

Exploring factors that can impact upon a jury is another difficult area to research. It would be unethical to conduct an experiment and

manipulate variables in a real case. As such, most research is based on mock trials and staged events with confederates. This allows researchers to control for unwanted extraneous variables that might impact on the findings. However, due to its artificial setting, it could lack **ecological validity**. (In this case, can findings reflect how decisions are truly made in a court?)

Ecological validity considers to what extent the findings can be generalised to the setting and the context they are being applied to.



Figure 8.8 Members of a jury are affected by their personal schemas when making judgements about a defendant’s guilt.



Figure 8.9 Jennifer Eberhardt works with the community to reduce racism in the justice system.

How race and cultural background can influence a jury

We only need to study history or watch the news to see that people are discriminated against based upon their race or cultural background. American social psychologist Jennifer Eberhardt and her colleagues found ‘in cases involving a White victim, the more stereotypically Black a defendant is perceived to be, the more likely that person is to be sentenced to death for the same crime’ (Eberhardt, Davies et al., 2006). In another study, people who were shown black faces identified a blurry image as a gun more quickly than those who were exposed to white faces or no faces (Eberhardt, Goff et al., 2004). The quick decisions made by the participants demonstrate that their existing schemas around criminality were subject to bias and racist stereotypes. For some, racial bias is implicit and unconscious, but such findings highlight how

Did you know?

In 2020, approximately 30 per cent of the prison population in Australia were of Aboriginal and Torres Strait Islander background. What do you think this overrepresentation suggests about the justice system in Australia?

important it is to be critical of the way in which the media reports crimes and reflect upon any implicit stereotypes that we might hold.

The psychology of racism

Social psychology contends that racism occurs because, as humans, we are constantly categorising ourselves and seeking to belong to a group. We then show favouritism towards the group that we belong to and provide preferential treatment to those who are similar to us. These similarities might be based on age, gender or race. We tend to view all members of our in-group as unique and individuals. However, anyone who is different and belongs to the out-group is seen to be homogeneous, which means they are considered to be all the same and to share the same stereotypical characteristics. This is concerning, especially when these biased views are reinforced by the media, political and other leaders, friends and family, and members of the in-group.

How attractiveness can influence a jury

While we all know the saying ‘Never judge a book by its cover’, the reality is that people make lasting judgements daily based on first impressions. This is known as the *implicit personality theory* and is another example of how our schemas are prone to bias and can result in discrimination.

Castellow, Wuensch and Moore (1990) investigated whether the attractiveness levels of the plaintiff and the defendant matter in trials. In a mock trial, where everything was the same except for the images of the plaintiff and defendant that they showed the jury, the researchers found that if the defendant was attractive and the plaintiff was unattractive, 41 per cent of participants decided the defendant was guilty. When reversed, and the plaintiff was attractive but the defendant was unattractive, 83 per cent delivered a guilty verdict. Attractiveness is certainly an influential factor, and it is why people are advised to dress well for court appearances.

Where did the schema associating attractiveness and being trustworthy develop? Think back to the movies and stories you read as a child. The hero is often attractive and caring whereas the villain is ugly, scheming and selfish. This can develop into the *halo effect*, which occurs when any positive characteristic is identified and then generalised so that people assume that they have other positive characteristics too. The halo effect

can explain the findings of the study on the previous page. Jury members noticed the positive characteristic of being attractive and then made wider assumptions, which had implications for whether or not they thought the person would have committed a crime. The halo effect does not only apply to attractiveness; it can also relate to a person's level of power, their accent or even which sporting team they support.



Figure 8.10 What do you think would happen if the people above were on trial? What assumptions and stereotypes might be applied in the courtroom?

Activity 8.4

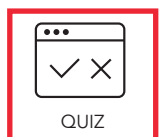
Jury

- 1 Identify other places you see the halo effect operating in society. Give one example that relates to attractiveness and one that relates to a different factor.
- 2 Design an experiment that could be conducted to investigate how age might impact upon the decisions of a jury member.

Review 8.4

Factors that influence a jury

- 1 Define confederate.
- 2 Identify who investigated whether the attractiveness levels of the plaintiff and the defendant matter in trials.
- 3 Describe what schemas are.



8.5

End-of-chapter test



Multiple-choice questions

- 1 What is a key limitation in research that investigates factors that influence a jury?
 - A They lack real-life application, as they are normally conducted using mock juries
 - B They contain too many leading questions
 - C They are too distressing for jury members
 - D They often require a real event to take place and therefore are rarely conducted
- 2 The term 'internalisation' is associated with:
 - A Social learning theory
 - B A self-fulfilling prophecy
 - C The genetic explanation for criminal behaviour
 - D How brain structures can explain an individual's behaviour
- 3 Sasha has just witnessed an armed robbery at her local bank. Which of the following is an example of a leading question?
 - A Can you recount what happened next?
 - B How many offenders were there in the bank?
 - C What did the man take when he left the bank?
 - D What time was it when this happened?
- 4 Which of the statements regarding implicit/subliminal racism is correct?
 - A Often the person is unaware that they hold racist views.
 - B The media deliberately try to stop subliminal racism in their articles.
 - C The person is aware of their racist beliefs.
 - D The person is aware of their racist beliefs, but their behaviour does not reflect their beliefs.
- 5 Antonio has experienced an acquired brain injury in his prefrontal lobe. If he were to commit a crime, which of the following crimes is he most likely to commit?
 - A Pre-meditated murder
 - B Embezzling (stealing) one million dollars from his employer without them knowing
 - C Tax fraud
 - D Aggressive assault at a bar

Short-answer questions

- 1 While walking home, Chang turned the corner and bumped into a man who was pointing a gun at him and who quickly snatched his bag. Upset and in shock, Chang was annoyed that he couldn't remember what the man looked like. With reference to the weapon focus effect, explain why it is understandable that Chang can't remember the event clearly.
- 2 Recall what the Yerkes-Dodson law states and give an explanation for it.

Extended-response question

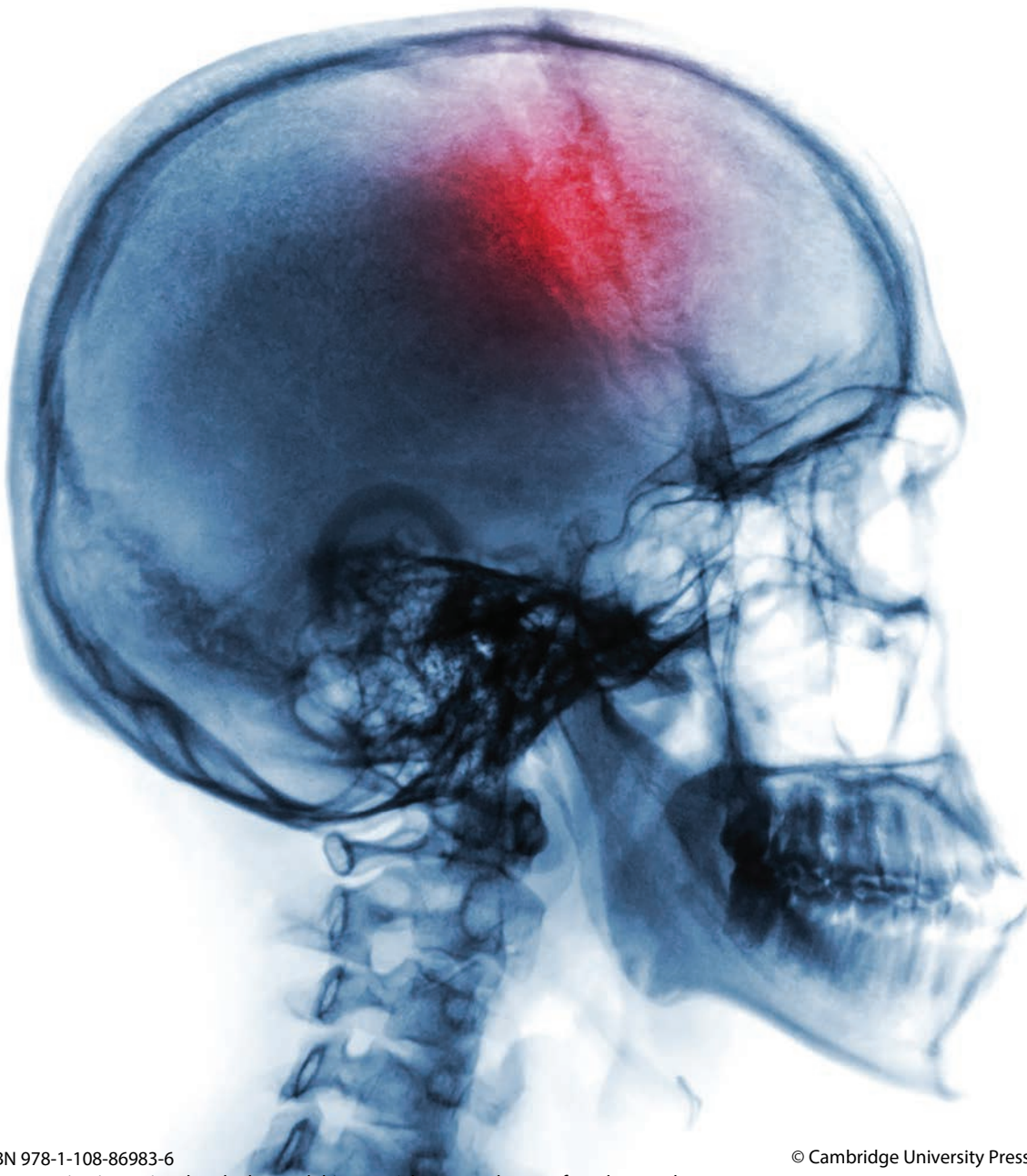
Matilda has been caught stealing a car. Her family is very concerned about this and wonders where Matilda would have learned how to break in and steal a car. Her teacher has commented that she is spending a lot of time with another student, who has previously been caught trying to steal a car. With reference to the five stages of social learning theory, explain why Matilda engaged in criminal behaviour.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.

Figure 8.11 Biological factors relating to the brain may cause criminal behaviours in some people.

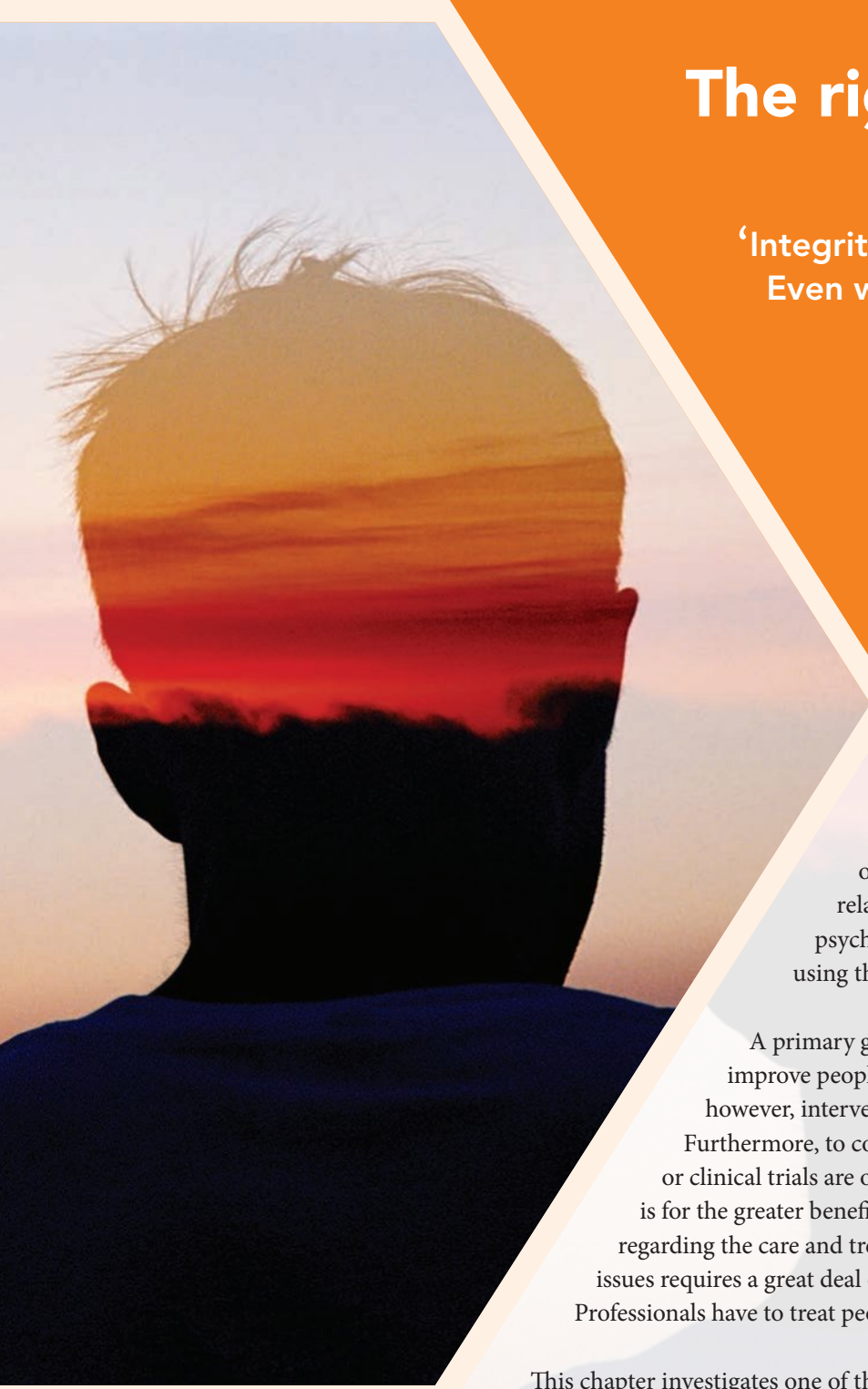


Chapter 9

The right or wrong of ethics

‘Integrity is doing the right thing.
Even when no one is watching.’

— C.S. Lewis



Mental health services are an integral part of promoting and managing mental health. A key part of any mental health service is the relationship between the professionals (e.g. psychiatrist or psychologist) and the person using their service (e.g. the patient or client).

A primary goal of psychology and psychiatry is to improve people's lives and to help them. To do this, however, interventions, such as treatments, are required. Furthermore, to continue improving treatments, research or clinical trials are often conducted at the same time. This is for the greater benefit of all. Importantly, the decisions regarding the care and treatment of people with mental health issues requires a great deal of responsibility and ethical conduct. Professionals have to treat people with respect and dignity.

This chapter investigates one of the greatest ethical scandals in Australian history: the Chelmsford Hospital scandal of the 1970s. As the case study of Chelmsford demonstrated psychiatric misconduct, this chapter focuses on the RANZCP Code of Ethics for psychiatrists. The rights of involuntary patients in Australia will also be explored, as a number of the patients at Chelmsford Hospital were involuntary.

9.1

Ethics: what are they?

Ethics are moral guidelines, or rules of conduct. Ethics help us distinguish right from wrong. They protect patients, research participants, the profession (whether it be psychology or psychiatry, for example) and the professionals themselves (the psychologist or psychiatrist).

Ethics moral guidelines, or rules of conduct, that help us distinguish right from wrong.

Across the world, professions have their own regulatory boards and **codes of ethics** that professionals must abide by for their actions to be judged as **ethical conduct**. In Australia, psychologists and psychiatrists are registered through the **Australian Health Practitioner Regulation Agency (AHPRA)**. AHPRA is responsible for the registration and accreditation of 15 health professions in Australia, including medicine, psychology, nursing, physiotherapy and dentistry. In Australia, psychologists must also abide by the **Australian Psychological Society (APS)** Code of Ethics. Psychiatrists follow two codes of ethics. They must follow the **Medical Board of Australia** Code of Ethics, as they are qualified medical doctors. In addition, they must follow the **Royal Australian and New Zealand College of Psychiatrists (RANZCP)** Code of Ethics.

Code of ethics a set of ethical guidelines that act as rules that professionals must abide by. If they breach the code, they can be deregistered.

Ethical conduct actions/behaviour of professionals that should follow their code of ethics.

Australian Health Practitioner Regulation Agency (AHPRA) responsible for the registration and accreditation of 15 health professions across Australia, including psychology, medicine, nursing and dentistry.

Australian Psychological Society (APS) psychologists in Australia abide by its code of ethics.

Medical Board of Australia organisation that regulates all medical practitioners in Australia.

Royal Australian and New Zealand College of Psychiatrists (RANZCP) psychiatrists in Australia abide by its code of ethics.

A key difference between psychiatrists and psychologists is their pathway of study. A psychiatrist trains as a doctor first, by completing a medical degree, and then

specialises in psychiatry. This usually takes 12 or more years of study. A psychologist completes a general degree, with a fourth year of study specialising in psychology, before completing a Masters or PhD (doctorate). Following their post-graduate degree, psychologists then complete supervised training before their registration. Psychologists have a minimum of six years of study, if not more.



Figure 9.1 Psychologists and psychiatrists try to form strong professional relationships with their clients to better help them.



Figure 9.2 Both psychiatrists and psychologists complete many years of study before they are qualified to practise.

Why do we need codes of ethics?

Although most of us would like to think we know the difference between right and wrong, people do not necessarily agree all the time. What might be seen as the ‘right thing to do’ by one person might disgust another.

Therefore, codes of ethics have been written so that regardless of someone’s personal opinion, *they must follow the rules*. If the code of ethics is broken, they *have broken the rules – regardless of their personal moral judgement*. If a professional breaks their code of ethics, they can be deregistered and no longer be able to practise.

Exemplar ethical principles

The case study in this chapter is the Chelmsford Hospital scandal of the 1970s, which involved misconduct by a psychiatrist. Therefore, a relevant example to illustrate the ethical principles of the RANZCP Code of Ethics for Psychiatrists. The RANZCP has 11 principles in its Code of Ethics, as shown in Table 9.1.

The fifth principle in this code is particularly important, as a number of patients at Chelmsford hospital were involuntary. The rights of involuntary patients in Australia are explained in the next section of the chapter, before the final section which investigates what actually happened at Chelmsford.

RANZCP Code of Ethics for Psychiatrists (2018)

- 1 Psychiatrists shall respect the humanity, dignity and autonomy of all patients.
- 2 Psychiatrists shall not exploit patients.
- 3 Psychiatrists shall provide the best attainable care for their patients.
- 4 Psychiatrists shall maintain the privacy and **confidentiality** of patients and their families.
- 5 Psychiatrists shall seek **valid consent** from their patients before undertaking any procedure, treatment or provision of a report for legal or other purposes.
- 6 Psychiatrists shall not misuse their professional knowledge and skills.
- 7 Psychiatrists involved in clinical research shall adhere to ethical principles embodied in recognised national and international guidelines.
- 8 Psychiatrists shall develop, maintain and share their professional knowledge and skills with colleagues, trainees and students, and with patients and their families/**whānau**.
- 9 Psychiatrists have a duty to attend to their own health and wellbeing and that of their colleagues, including trainees and students.
- 10 Psychiatrists shall uphold the **integrity** of the medical profession.
- 11 Psychiatrists shall strive to improve mental health services, to promote community awareness of mental illness and its treatment and prevention, and to eliminate discrimination against people with mental illness.

Table 9.1 The 11 principles of the RANZCP Code of Ethics

Source: RANZCP (2018b)

Confidentiality a person’s right to have their name withheld and their information kept private.

Valid consent where a person is informed so that they understand the nature, risks and purpose of treatment or research they will be receiving in the future, and they agree to it.

Whānau Māori term in New Zealand, meaning family and extended family in the community.

Integrity the quality of being consistent, reliable, reflective of values and demonstrating ‘doing the right thing’.

Activity 9.1

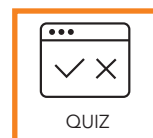
RANZCP Code of Ethics

Of the 11 principles of the RANZCP Code of Ethics, choose five that you believe to be most important (to you) and describe them in your notes. You may also like to read further about these principles on the RANZCP website.

Review 9.1

Ethics: what are they?

- 1 Define ethics.
- 2 Recall what AHPRA stands for and describe what it does.
- 3 Recall what RANZCP and APS stand for. Identify who their respective Codes of Ethics apply to.
- 4 Distinguish two key differences between psychologists and psychiatrists.
- 5 Recall the reasons professionals have a code of ethics.



9.2

What are our rights as patients in Australia?

To understand the importance of a code of ethics in mental health services, it is helpful for us to also understand the rights of mental health patients in Australia. In Australia, more than four million people per year receive a prescription for mental health treatment, with over 70 per cent of those being antidepressant medications (Australian Institute of Health and Welfare, 2020a). Some mental health treatments need to be provided in a clinical setting. If you, or someone you know, is recommended to have a mental health treatment, such as electroconvulsive therapy or neurosurgery, what are your rights?

Electroconvulsive therapy (ECT) is a form of medical therapy where low levels of electrical impulses are applied to an anaesthetised patient's skull (and brain). If administered correctly, ECT is a safe and successful treatment. The use of ECT must be approved either by a patient who has the capacity to give valid consent or, if they have reduced capacity to give consent, its use can be approved by the Mental Health Tribunal.

Electroconvulsive therapy (ECT) a form of medical therapy where low levels of electrical impulses are applied to an anaesthetised patient's skull (and brain).

Neurosurgery broadly means any kind of surgery on the brain or nervous system but its use to treat mental illness is limited and controlled. There are neurosurgical operations on the brain (previously known as **psychosurgery**) where **focal lesions** are made in order to treat severe mental illnesses.

This kind of neurosurgery is only ever used when other treatments have not been successful, and the person is suffering. There are only a very small number of such operations performed in Australia each year. Accordingly, neurosurgery for mental illnesses is rare. Neurosurgery is regulated by law by each state and territory.

Neurosurgery in the context of psychiatry, an operation on the brain rarely used to treat severe mental illnesses that have not responded to other treatments.

Psychosurgery an outdated form of neurosurgery to treat symptoms of mental illness, commonly used during the 20th Century.

Focal lesion a small piece of the brain is removed or destroyed – this can be done either by cutting, freezing, heating or irradiating.

The most common mental health treatments, therefore, tend to be face-to-face talks with psychologists and psychiatrists, and prescription medication.



Figure 9.3 Neurosurgery in the context of psychiatry involves an operation on the brain to help resolve mental health issues – this procedure is now rare.

Currently, a growing area of research in Australia is the use of **deep brain stimulation (DBS)** for the treatment of mental illnesses. DBS is a neurosurgical procedure where electrodes are placed deep into the brain in regions where electrical stimulation has the effect of alleviating symptoms of a disorder (RANZCP, 2018a). Current research indicates that DBS could be effective for severe depression and some types of anxiety disorders, such as obsessive-compulsive disorder (OCD).

Deep brain stimulation (DBS) a neurosurgical procedure where electrodes are placed deep into the brain in regions where electrical stimulation has the effect of alleviating symptoms of a disorder.

A person's rights

In Australia, voluntary patients have the right to refuse treatment. (The next section defines involuntary patients and their ethical treatment, this subsection deals with voluntary patients, meaning those capable of decisions about their treatment). A person also has the right to a

second opinion. A person has the right to be fully informed about the nature of the treatment(s) being recommended to them. Furthermore, they have a right to seek legal advice or have someone represent them, or be with them, when they are informed about the treatment.

What is valid consent?

A person who is recommended to have mental health treatment must be told about the nature, risks and purpose of a treatment in plain language. Further, the person's rights need to be explained. When the person understands all these points and agrees to continue with mental health treatment, only then can they sign a consent form.

What if a person changes their mind after giving consent?

Fortunately, if a patient changes their mind after signing the consent form, they can withdraw their consent and the mental health treatment will not proceed.



QUIZ

Review 9.2

What are our rights as voluntary patients in Australia?

- 1 Identify two examples of mental health treatments.
- 2 Clarify whether a person can refuse neurosurgery, DBS and/or ECT.
- 3 Outline the safeguards in place for people who are recommended to receive ECT, DBS and/or neurosurgery.
- 4 Describe what valid consent involves.
- 5 Clarify what happens if someone changes their mind after signing a consent form.



Figure 9.4 Voluntary mental health patients must be fully informed about the recommended treatment *prior* to the treatment beginning.

9.3

What does it mean to be an 'involuntary' patient?

To be an **involuntary patient** means that a person is receiving **involuntary treatment**, or treatment that is out of their control. This occurs when it has been deemed necessary that, for a person's benefit, their doctor (and the state) should make decisions about their treatment as part of their care. Involuntary treatment may occur when a person's symptoms from their mental health illness reduce their capacity to give consent or lead to their rights being restricted for a period of time. Involuntary treatment can occur in either a hospital or community setting. In Australia, about 25 per cent of mental health patients in hospital settings are involuntary, so the majority are voluntary (AIHW, 2020a).

Involuntary patient a person who is receiving involuntary treatment deemed necessary for their benefit.

Involuntary treatment refers to where a person receives treatment for their illness without consent either in a hospital or community setting.

For involuntary treatment to apply to a person, an **involuntary treatment order** needs to be placed; that is, a recommendation by a doctor. Each state and territory in Australia has its own processes – in Victoria, for example, these orders are called Compulsory Treatment Orders. For a person to be subject to an involuntary treatment order, they must show the following:

Figure 9.5 Involuntary treatment accounts for about 25 per cent of Australia's mental health patients in hospital settings.



ISBN 978-1-108-86983-6

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- they appear to be suffering from a mental illness
- their treatment is necessary for their own personal health and safety, or for the protection of others
- they require treatment as soon as possible
- the person has refused or is unable to consent to treatment
- there are no suitable alternative treatments
- there are no less restrictive means available to provide treatment.

Involuntary treatment order a recommendation by a health professional (usually a doctor) for a person to be taken care of by the state because they either refuse treatment for their mental illness or are unable to look after themselves.

Within 24 hours of the order being placed, a psychiatrist will often assess the person. If the person fits the criteria, the psychiatrist will confirm the order. The person will then be placed either in a mental health service as an involuntary patient or on a **community treatment order (CTO)**. A CTO means that the person can receive involuntary treatment while they continue to live in the community.

Community treatment order (CTO) where a person is allowed to live in the community while they receive involuntary treatment.

What are the rights of involuntary patients in Australia?

A person who is receiving involuntary treatment in a mental health service and is an involuntary patient has rights. What are they?

- The person has the right to make a complaint about how they are cared for.
- The person has the right to be informed of the treatments they are receiving, although they may receive treatments without their agreement.
- The person has the right to a second opinion and rights to documents relating to them under Freedom of Information laws.
- The person has the right to a lawyer or to contact the Ombudsman.



- The person's wishes and preferences for their treatment will be considered. However, the psychiatrist will have the final say.
- The person will receive a copy of their treatment plan.
- Staff are to discuss with the patient their diagnosis and progress on a regular basis.
- The patient may have a friend or **advocate** with them when planning treatment.

Advocate someone who can support or argue for a person.

A person who is receiving involuntary treatment also has some entitlements or privileges, including:

- Leave of absence: the patient may apply for a leave of absence to visit family and friends, if approved by a psychiatrist.
- Letters and telephone calls: the patient can contact people via phone and letters.

What about the use of seclusion and restraint with involuntary patients?

Since 2014 in Australia, the use of **seclusion** and **restraint** has been under heavy review and scrutiny. The use of these restrictive practices is regulated by the *Mental Health Act 2007*.

Seclusion a process by which a person is placed in a room by themselves where the windows and doors are locked on the outside.

Restraint a process by which a person's freedom to move is restricted.

Seclusion is when a person is kept alone in a room where all the windows and doors are locked from the outside. This occurs when it is necessary to protect the person, or others, from risk to their health and safety. Restraint is when a device is used to restrict a person's freedom to move. Restraint may be used to allow the person to be treated medically to prevent the patient hurting themselves or others, or from destroying property.

Both seclusion and restraint are **restrictive practices**, and advocates for people with mental illness argue that the use of restrictive practices infringe on basic human rights. In 2016, the RANZCP acknowledged this, and said that restrictive practices can also

compromise the therapeutic relationship between a psychiatrist and their patient. The RANZCP has made a commitment to minimise the use of restrictive practices. In 2018, for the first time in Australian history, data on the use by hospitals of seclusion and mechanical and physical restraint was publicly reported. The rate of seclusion nationally in 2018 was 7.3 per 1000 bed days, a significant decrease from the rate of 15.6 in 2008–09. The average duration of seclusion in Australia is approximately 4.2 hours. Restraint has only been properly measured recently, so currently the rate is around 11 per 1000 bed days. Restraint is more likely to occur in **forensic** psychiatric hospitals than in general population hospitals, whereas general population hospitals are more likely to use seclusion as a restrictive practice (AIHW, 2020b).

Restrictive practices refers to the use of seclusion and restraint in mental health settings.

Forensic of or relating to a criminal offense.

Rights of patients in seclusion or restraint

If a person is placed in seclusion or restraint they have rights, including:

- Nurses must check on them at least every 15 minutes, and a doctor must examine them every four hours (unless a psychiatrist deems that less frequent examinations are acceptable).
- If restrained, the patient must be observed *continuously*.
- Staff must provide appropriate food, drink, clothing, toileting and bedding.

Figure 9.6 Australia has committed to reducing the use of restrictive practices in hospitals.



When can involuntary patients leave hospital?

Discharge allows an involuntary patient to leave the hospital. When a psychiatrist believes that the person no longer fits the criteria of involuntary patient, the patient will be discharged. The patient will be free to leave or, where accepted by the institution, the patient may choose to remain for treatment voluntarily.

Discharge when an involuntary patient has been deemed by their psychiatrist to no longer fit the criteria of involuntary patient and is now free to leave the institution.

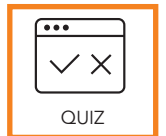
If a person wants to be discharged and a psychiatrist will not approve this, then the person cannot leave, because they are involuntary. They are deemed unfit to independently care for themselves. An involuntary patient does have the right to **appeal** to the Mental Health Review Board. The board will review the person's appeal within eight weeks of their initial entry as an involuntary patient and then every 12 months after that.

Appeal an application for a decision to be reversed.

Review 9.3

What does it mean to be an 'involuntary' patient?

- 1 Outline what it means to be an 'involuntary' patient.
- 2 Describe the different types of treatment orders.
- 3 Identify and describe three rights an involuntary patient has that you think are important.
- 4 Identify and describe two entitlements (or privileges) an involuntary patient has.
- 5 Define 'seclusion' and 'restraint'.
- 6 Clarify whether an involuntary patient is free to leave an institution whenever they wish.



9.4

Chelmsford Hospital scandal: deep sleep therapy

In the second half of this chapter, we consider the Chelmsford Hospital scandal and apply our understanding of the ethics of mental health professionals and rights of involuntary patients. Chelmsford Hospital was a private hospital in Sydney in the 1960s and 1970s that became notorious for unethical practices, resulting in the death of patients, under the leadership of Dr Harry Bailey.

The beginning

Dr Bailey, born in New South Wales in 1922, was a pharmacist's assistant before getting married. He eventually completed a medical degree at Sydney University. Bailey specialised in psychiatry and, before his downfall, was one of the most reputable psychiatrists in New South Wales.

In 1954, Bailey won a fellowship to study with eminent psychiatrists Dr Ewan Cameron and

Dr William Sargant. At this time, psychosurgery was a popular form of treatment for mental illness, as outlined in section 9.2. In Australia today, neurosurgery is rarely utilised as a treatment for mental health. Sargant and Cameron favoured treatments such as **lobotomy** – a form of psychosurgery that stopped being performed after the 1970s due to public backlash over the significant harms that could occur to a patient as a result of the procedure. Sargant and Cameron believed that the best methods to treat mental illness included frequent high dosages of electrochemical stimulation, psychosurgery, drugs and **deep sleep therapy (DST)**. Their perspective and practices greatly influenced Bailey.

Lobotomy (also known as frontal lobotomy or leucotomy in Australia) neurosurgery that disconnects the nerves of the frontal lobe from the rest of the brain. This procedure is no longer performed.

Deep sleep therapy (DST) where a person is in a coma (unconscious state) induced by drugs.



Figure 9.7 Dr Harry Bailey was the lead psychiatrist responsible for the use of deep sleep therapy at Chelmsford Hospital in Sydney.

What was deep sleep therapy?

Doctors have believed in the power of sleep for restoration and recovery for centuries. However, in the nineteenth century, doctors became interested in how to chemically induce sleep and experimented with chloroform, bromide and opium at that time (Walton, 2013). This then developed into DST.

In DST, patients were put into **narcosis** using drugs called **narcotics** until they were unconscious and then kept in this state of unconsciousness for an extended period. The prolonged unconsciousness was referred to as an ‘induced coma’. A common narcotic used in DST was **barbiturates**. Barbiturates were favoured by Bailey when he induced comas in his patients at Chelmsford Hospital. Often patients were kept for up to three months in a state of deep sleep, being woken up long enough for bouts of other therapies such as ECT.

Narcosis a state of drowsiness, sleep or unconsciousness caused by drugs.

Narcotics any drugs that induce narcosis or decrease sensitivity to pain, such as opiates.

Barbiturates a type of narcotic; a form of depressant drug that has a sedative effect and can be highly addictive.



Figure 9.8 Narcotics were used to sedate patients undergoing deep sleep therapy at Chelmsford Hospital.

If administered correctly, ECT is a safe and successful treatment. As described earlier, ECT is a form of medical therapy where low levels of electrical impulses are applied to an anaesthetised patient’s skull (and brain). However, psychiatrists such as Bailey, Cameron and Sargant tended to use DST to overcome patients’ *refusal* to have ECT. Furthermore, they misused ECT – it was administered more frequently, and at higher and more dangerous doses, than acceptable.

The risks of DST

Bailey and his colleagues were not the first to use DST in Australia. A Melbourne-based psychiatrist, Dr Reg Ellery, learned about DST in Europe in the 1930s and began treatment in his private hospital in Victoria. He described his use of DST in his autobiography *The Cow Jumped Over the Moon* (Ellery, 1956). Ellery ceased using DST in the 1950s and recognised the hazards of the treatment. Despite this, Bailey began DST a decade later in Sydney.

There were many risks for patients in being given DST. As patients were kept in constant sedation, they had weakened immune systems and were more vulnerable to contracting other illnesses. Being unconscious and immobilised further increased complications, particularly with internal organs. After treatment, those who survived reported hallucinations and significant muscle weakness (*Walton v Gardiner* [1993]).

Bailey used DST to treat patients with depression, anorexia nervosa, schizophrenia and drug addiction. Nurses at the hospital dubbed the ward of patients undergoing DST as the ‘zombie room’. In Bailey’s first two years at Chelmsford Hospital, five patients died during DST. More deaths followed until an inquest was held in 1967 (four years after Bailey began at Chelmsford). The majority of these patients were involuntary. They did not understand their rights and families were often not communicated with about their progress. The coroner at the inquest in 1967, however, did not find Bailey culpable and instead was impressed by the reputable psychiatrist.

The Citizens Committee on Human Rights, a part of the Church of Scientology, received information from a nurse about Bailey’s mistreatment of patients. They campaigned for an investigation into Bailey’s practices at Chelmsford. While this did help end these practices, this committee is controversial for its broad anti-psychiatry agenda. See the next section for more discussion of this.

In 1974, an investigation by the ABC television program *Four Corners* further fuelled public concern about Bailey’s practices. The ABC reported on Bailey’s use of lobotomies. By that stage, he had conducted 150 **leucotomies** – a type of lobotomy (Soares et al., 2013).

Leucotomy surgery that cuts through the white matter in the prefrontal lobe in the brain. In practice, there is little difference between a leucotomy and a lobotomy.

The death toll increased

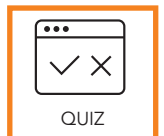
Bailey closed down his practice at Chelmsford in 1979 due to the growing pressure and scrutiny he was under from both the media and the government. By this time, he and his colleagues, Dr John Herron, Dr Ian Gardiner and Dr John Gill, had been administering DST over a period of 14 years at the private hospital. Tragically, during that time at least 24 patients had died during DST at Chelmsford.

Bailey clearly misused his professional power on many levels. His colleagues knew of his sexual relationships with a number of female patients and other staff at the hospital. Additionally, despite receiving criticisms for some of his written articles and research, Bailey often talked up his achievements. One of Bailey’s patients, Sharon Hamilton, became his lover, and later committed suicide, leaving Bailey as one of the beneficiaries of her estate. Bailey’s reputation was damaged further by this. It was felt he may have influenced Hamilton and therefore exploited her.

Review 9.4

Chelmsford Hospital scandal: deep sleep therapy

- 1 Define lobotomy.
- 2 Describe DST and account for why it is also referred to as ‘narcosis’.
- 3 Describe ECT. In your answer, discuss whether or not this is a safe treatment.
- 4 Outline the unethical use of ECT by some psychiatrists in the past, such as Bailey, Cameron and Sargent.
- 5 Explain the risks for patients receiving DST.
- 6 When were the first signs that there were issues with Bailey’s use of DST? Describe these signs using examples from the text.
- 7 When did Chelmsford Hospital finally close? Explain why it closed.
- 8 Identify ways Bailey misused his power.



9.5

Chelmsford Hospital scandal: the whistle-blowers

Complaints were made to Sir Henry Roth, who was at the time Professor of Psychiatry at Cambridge University. Sir Henry acknowledged that what had occurred was inhumane, but also urged that the issue be kept confidential for the time being (Chandler & MacDonald, 1991).

Bailey was informed that a **Royal Commission** was to be established to investigate reports of unethical medical treatment at the hospital. He contacted his old mentor, Dr Sargent, in London and asked if he would testify at the Commission in Bailey's favour. In an effort to justify the practices at Chelmsford, Bailey insisted that his use of DST was a variation of previous therapies used by Sargent, and therefore innovative.

Royal Commission a major government public inquiry into an issue.

Bailey and Sargent had continued a strong relationship throughout the years, and Bailey had often spoken to his colleagues about the morbid competition between the two to see who could keep their patients in the deepest coma without killing them (Bromberger & Fife-Yeomans, 1991).

Sargent, however, disappointed Bailey. He destroyed all communication he had between himself and Bailey, and destroyed communication from Dr Cameron as well.

Sargent was fearful. His response to Bailey's request was that he would testify but that 'I should have found myself supporting the prosecution and not the defence' (Streatfeild, 2006).

Tensions between psychiatry and Scientology

Scientologists in New South Wales were among the main whistle-blowers on Chelmsford Hospital. Tensions between Scientologists and psychiatrists were particularly strong at the time. Scientology was criticised by many around the world, particularly psychiatrists, who were concerned about their practices. So strong was the criticism that Australia did not recognise the Church of Scientology as a religious faith until 1973. It was alleged by the media that Scientologists were upset about Australia not recognising their religion and, subsequently, they focused on discrediting prominent psychiatrists as part of a 'witch hunt' (Chandler & MacDonald, 1991). So, rather than the Church of Scientology's claim against Chelmsford being altruistic (for the greater good of the community), they likely had hidden motives. It is also important to note that psychiatry is a heavily regulated medical profession, whereas Scientology is a religious faith rather than a science.

Regardless of the motivations of the Church of Scientology, the practice of DST was unethical and had to be addressed.

Bailey's mental health was impacted by the scrutiny and pressure he was under. In 1983, Bailey was finally charged with manslaughter, but the charge was dismissed in 1985. By this stage, the media pressure was intense. On 8 September 1985, Bailey overdosed on barbiturates – the medication he had favoured when inducing comas in his own patients. He wrote in his suicide note, 'Let it be known that the Scientologists and the forces of madness have won' (Chandler & MacDonald, 1991).

Figure 9.9 Complaints about Bailey (and colleagues) were made to Sir Henry Roth, who was at the time Professor of Psychiatry at Cambridge University.



The Royal Commission

The Royal Commission heard evidence from October 1988 until July 1990 and found that more than 1400 deep sleep treatments had been administered to 1127 patients at Chelmsford Hospital for a variety of complaints, including depression, anorexia nervosa, stress, drug and alcohol problems, neuroses and schizophrenia. Of these patients, 24 people had died at the hospital due to complications arising from DST. An additional 24 people survived the treatment, but of those, 19 committed suicide within a year of being released from the hospital. Of those who survived, there were a number of cases of brain damage and other physical injuries (*Walton v Gardiner* [1993]).

The Royal Commission found that Dr Bailey, Dr Herron, Dr Gill and Dr Gardiner were guilty of medical negligence, obstruction of justice and fraud. First, there was evidence to suggest that many patients had not signed consent forms. Further, employees at the hospital had destroyed the unsigned consent forms prior to the Royal Commission being held. Second, there was also evidence that Bailey had signed fraudulent death certificates that did not accurately state the cause of death. In this way, Bailey avoided coroners' inquests. It turned out that of the 24 patients who had died, 17 had false death certificates (*Walton v Gardiner* [1993]).

Justice Slattery, who chaired the Royal Commission, stated in his final report that Bailey, Herron, Gardiner and Gill had been dishonest and negligent in administering large doses of drugs and ECT to patients without their or their family's consent.

Activity 9.2

Discussing Royal Commissions

Conduct some research online and identify any recent Royal Commissions into other issues that you are aware of. Discuss these as a class.

Further implications from Chelmsford

The Royal Commission helped raise awareness of the need for tighter regulation of mental health treatments in Australia. There is now increased scrutiny of the health profession, with an expectation that all health professionals abide by their relevant code of ethics. Currently, DST is listed in the *New South Wales Mental Health Act* in the 'Prohibited Treatments' section.

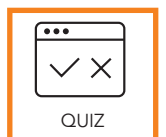
The impact of the Royal Commission took a toll on the doctors and staff at the hospital. In 2020, a court case was held with the Chelmsford doctors who were again defending their reputations. The case was instigated by Dr Herron and Dr Gill, who were determined to clear their names after being identified by ABC journalist Steve Cannane in his book *Fair Game* (2016). As Bailey had died in 1985, and Gardiner had died in 2003, the legal case only involved Herron and Gill.

This was not Herron and Gill's first time defending their role in the whole affair at Chelmsford Hospital. They claimed they had been set up by Scientologists at the time. Nonetheless, regardless of the evidence they provided, Herron and Gill were again not successful with their case (Sainty, 2020).

Review 9.5

Chelmsford Hospital scandal: the whistle-blowers

- 1 Describe the role Scientology played in the Chelmsford Hospital scandal.
- 2 Explain the tension between psychiatrists and Scientologists. Why did it exist?
- 3 Recall the evidence of malpractice presented to the Royal Commission in 1988.
- 4 Identify other criticisms the Royal Commission made of Dr Bailey and his colleagues.
- 5 Define the term 'Royal Commission'. Outline some benefits of the Royal Commission into Chelmsford.



9.6

Chelmsford Hospital scandal: unethical practices

Were Dr Bailey and his colleagues unethical in their administration of treatment to their patients?

It is useful now to consider the ethical principles outlined by the RANZCP, as stated earlier in this chapter, in relation to Chelmsford Hospital. These are outlined in Table 9.2.

Multiple relationships (also known as 'dual relationships') when a psychiatrist or psychologist has a patient who is also their friend, colleague, student, trainee or intimate.



Figure 9.10 Record keeping is an important aspect of upholding integrity in the mental health professions.

RANZCP Code of Ethics for Psychiatrists (2018)	Dr Harry Bailey and colleagues at Chelmsford Hospital, 1960s and 1970s
1 Psychiatrists shall respect the humanity, dignity and autonomy of all patients.	This principle relates to involuntary treatment of patients, with their welfare safeguarded. With the death and disability of a large number of patients at Chelmsford, and patients placed into deep comas, this principle was likely violated.
2 Psychiatrists shall not exploit patients.	Professionals, such as psychologists and psychiatrists, should avoid engaging in multiple relationships that may impair their effectiveness, objectivity and competence. In Australia, a psychiatrist or psychologist may not have a relationship with a patient or former patient until two years has passed since treatment ended. Furthermore, due to the imbalance of power between a doctor and their patient, psychiatrists are not to exploit their patients for their own gain – Bailey was thought to have exploited patients. For example, he had an affair with one of his patients who also made him a beneficiary of her will.
3 Psychiatrists shall provide the best attainable care for their patients.	Despite criticisms by his peers, and the death of other patients, Bailey continued to use the dangerous practice of DST and misuse ECT. Due to his misuse of ECT, he also contributed to ECT gaining a bad reputation among the general public.
4 Psychiatrists shall maintain the privacy and confidentiality of patients and their families.	There is no evidence that confidentiality was ever breached – families and patients named in articles often did so voluntarily, sharing their stories with the media or the Royal Commission. This ethical principle, therefore, was upheld.
5 Psychiatrists shall seek valid consent from their patients before undertaking any procedure, treatment or provision of a report for legal or other purposes.	Valid consent is where the nature, risks and purpose of a treatment are explained to a patient in plain language. Further, the person's rights need to be explained, such as their right to confidentiality. For both psychologists and psychiatrists, this is a very important ethical principle to abide by. It respects the rights and dignity of all people. Bailey not only did not gain consent from his patients, but he also was found to have used DST to avoid patients' refusal of ECT. Further, he was later found to have destroyed any evidence of his failure to gain valid consent.

Table 9.2 The 11 principles of the RANZCP as they apply to the conduct of Bailey and his colleagues at Chelmsford

RANZCP Code of Ethics for Psychiatrists (2018)	Dr Harry Bailey and colleagues at Chelmsford Hospital, 1960s and 1970s
6 Psychiatrists shall not misuse their professional knowledge and skills.	The use of DST by Bailey and colleagues in the first place is highly questionable. Moreover, their use of DST to override consent to ECT, which they delivered in frequent and high doses, was a misuse of ECT; particularly as ECT is utilised safely and successfully in Australia today.
7 Psychiatrists involved in clinical research shall adhere to ethical principles embodied in recognised national and international guidelines.	Many valuable medical treatments have been discovered through innovation and experimentation. The safety and welfare of research participants is crucial, however, particularly when patients are vulnerable – such as mental health patients. Benefits of experiments must be judged against possible harms to patients. Bailey insisted that his form of DST was a variation of previous therapies and therefore innovative. He used this to excuse the practices at Chelmsford.
8 Psychiatrists shall develop, maintain and share their professional knowledge and skills with colleagues, trainees and students, and with patients and their families.	As reported by media both at the time and more recently, families were not informed of the progress of their loved ones at Chelmsford and were often obstructed from visiting their family members at the hospital.
9 Psychiatrists have a duty to attend to their own health and wellbeing and that of their colleagues, including trainees and students.	Due to personal and professional pressure, Bailey did not care for his own health and began to misuse substances including alcohol and barbiturates. It is likely that his wellbeing suffered, followed by his suicide in 1985.
10 Psychiatrists shall uphold the integrity of the medical profession.	<p>Psychiatrists and psychologists must avoid engaging in disreputable behaviour that reflects poorly upon themselves and also on their profession. Not only did Bailey bring himself into disrepute, but he also tainted the reputation of Chelmsford Hospital and its employees. Bailey's behaviour also tarnished the reputation of other psychiatrists.</p> <p>Finally, Bailey and his colleagues destroyed records. In Australia, health professionals must keep accurate records for a minimum of seven years. For people under the age of 18, records must be kept until they are at least 25 years of age. Bailey did not do this, and was also found guilty of destroying paperwork. Therefore, the behaviour of Chelmsford doctors did not reflect integrity.</p>
11 Psychiatrists shall strive to improve mental health services, to promote community awareness of mental illness and its treatment and prevention, and to eliminate discrimination against people with mental illness.	It is arguable that Bailey and his colleagues damaged both the reputation of psychiatry in Australia at the time, and also increased the stigma of mental illness, with mental health patients becoming more reluctant to seek help for their issues due to fears of receiving treatment like that which had occurred at Chelmsford. Fortunately, our mental health services have come a long way since Chelmsford, with Australia having some of the best psychiatrists and psychiatric care in the world. A positive and important example is Dr Patrick McGorry, an Australian of the Year, who helped establish headspace (which advocates national youth mental health).

Table 9.2 (Continued)

Other unethical experiments – psychic-driving

There are, unfortunately, other examples of unethical experiments. Bailey's mentor, Dr Cameron, became infamous for his use of DST and another therapy called 'psychic-driving'.

Psychic-driving later became known as 'brainwashing' or mind control. Cameron was attempting to 'wipe the patients' minds clean' and then reprogram them (Ross, 2006).

Psychic-driving a method used by Dr Ewan Cameron to reprogram the mind of a sedated patient by playing them hours of commands on tape. This method also became known as brainwashing.

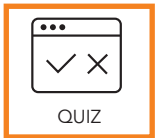
In the first stage of treatment, patients would be placed in **sensory deprivation** (dark rooms, with no interaction with others), and then into a very deep sleep by DST. The deep sleep reduced them to a vegetative state. They would then be

given high doses of ECT and drugs. The second stage of the therapy was 'psychic-driving'.

This was where hundreds of hours of tape would be played into the patient's ears through headphones or a special helmet. The tape would be of either a negative or positive type. For example, 'There's something wrong with you, nobody likes you' or 'People like you. You like people' (Streatfeild, 2006).

Sensory deprivation where a person is placed in a room with no sensory stimulation (e.g. dark empty rooms, or bright white rooms with no windows or people).

Cameron's treatment of patients was highly unethical and a violation of human rights. The CIA in America became very interested in Cameron's techniques and it funded some of his research. Cameron accepted and became part of the CIA's notorious MKUltra project. To find out more, search for 'MKUltra' on the internet.



Review 9.6

Chelmsford Hospital scandal: unethical practices

- 1 Account for why psychic-driving was nicknamed 'brainwashing'.
- 2 Define sensory deprivation.
- 3 Define psychic-driving and describe how DST is used in it. Outline the steps of psychic-driving.

9.7

End-of-chapter test



Multiple-choice questions

- 1 By destroying records, Dr Bailey and his colleagues would best be described as:
 - A Breaching the integrity of their profession
 - B Not providing the best psychiatric care
 - C Not maintaining confidentiality
 - D Not respecting the humanity and dignity of their patients
- 2 By having relationships with his patients, Dr Bailey was guilty of:
 - A Exploiting his patients
 - B Misusing his professional power
 - C Maintaining the privacy of his patients
 - D Adhering to ethical principles



- 3 Valid consent is where:
- A The nature, purpose and risks of treatment are explained
 - B The patient signs a consent form
 - C The patient's privacy is maintained
 - D A psychiatrist consents to treatment on behalf of a patient
- 4 An involuntary patient is someone who:
- A Requires treatment immediately
 - B Has refused or is unable to consent to treatment
 - C Has no alternative treatments available
 - D Has consented to treatment
- 5 An involuntary patient needs their psychiatrist's approval to:
- A Have a leave of absence
 - B Be discharged
 - C Change their treatment
 - D Appeal to the Mental Health Review Board

Short-answer questions

- 1 One of your friends has recently been admitted into a local hospital as an involuntary patient for mental health treatment. They are feeling distressed because they do not understand what it all means, and they think they have no rights. What would your response be? Explain.
- 2 You read in a newspaper article about a research study that investigated the effect of a vaccine in protecting the population from a new virus. The research participants involved are named in the article, and it also appears that they were not aware they were part of a research study. What ethical guidelines have been breached by the researcher? Explain.

Extended-response question

Imagine that all ethical principles had been followed at Chelmsford Hospital. Describe how valid consent and integrity *could have been* demonstrated by Dr Bailey and his associates for deep sleep therapy.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorchers Quiz
- Videos and other extra materials.

Chapter 10

Performance psychology

‘Some people want it to happen,
some wish it would happen,
and others make it happen.’

— Michael Jordan

What gives elite tennis players the winning edge? How can musicians play in front of thousands of people and not make a mistake? Whether it be on the sporting field, on stage or even in academic settings, **performance psychology** helps people reach their optimal level of performance. This chapter will focus on how to learn skills effectively, how to train your mind and how to respond when things go wrong.

Performance psychology a subfield of psychology that examines factors that influence optimal human performance.

10.1 Learning to perform well

Social learning theory

In Chapter 8, social learning theory was used to explain how someone could learn the skills required to commit a crime. This theory can be applied to learning any skill. Social learning theory emphasises the importance of role models and is a valuable way to learn complex skills. For example, Mila has just completed her first ballet pirouette. In order to perform this complicated move correctly, she needed to carry out each of the following stages.

- 1 *Attention:* Mila watched and listened intently to her teacher as she demonstrated how to turn. Mila would have completed this step several times.
- 2 *Retention:* Mila then consolidated the knowledge in her memory so that she could recall how to do it when the music started.
- 3 *Reproduction:* Mila needed to have the physical and cognitive ability to do the routine and the pirouette. She was old enough to remember the components and her muscles were strong enough to support her as she turned. It is important to remember that she did not replicate the behaviour in this stage.
- 4 *Motivation:* Everyone needs an incentive in order to carry out the behaviour. For Mila, her desire to become a ballerina when she is older was her internal motivation and the hope of receiving praise from her teacher and peers would have been her external motivation.

After these four stages have been achieved, Mila will then attempt to complete the behaviour.

- 5 *Reinforcement:* If Mila completes the turn successfully, she will receive praise and will be one step closer to becoming a ballerina. Receiving the elements that motivated her

act as reinforcers, and this will encourage her and increase the likelihood of her demonstrating the behaviour again.

Mirror neurons

Important biological changes in the brain also occur when we watch others complete a purposeful and goal-orientated task. When this happens, specialised neurons in the brain called *mirror neurons* are activated. When someone is watching someone else complete a task, functional brain scans, like **fMRIs**, show patterns that are similar to the brain activity that occurs when they are completing the task themselves.

fMRI a brain scan that can identify the structures of the brain, as well as parts of the brain that are active when completing a task.



Figure 10.1 Mila used the principles of social learning theory to develop her ballet skills.

For example, Edward spent most of the summer watching the Australian cricket team play on TV. His mirror neurons helped him to improve his bowling technique despite him not actually playing. He wanted to perfect his spin bowling, so he constantly watched the bowlers rather than the batters. As he watched them, his mirror neurons fired, and this helped him to practise and consolidate the moves required without having to do so physically. Edward's family was surprised to see how much he had improved, just by watching others play.

Visualisation

Have you ever wondered what athletes and musicians think about just before they start playing? It is likely that they are engaging in mental imagery, also known as **visualisation**. Visualisation helps us to rehearse our performance before we complete it. While mirror neurons help us to learn vicariously, visualisation is an active process, whereby the person rehearses the sensory experiences and motor movements in their mind. This process consolidates and strengthens the associated

neural pathways and helps perform the task with greater success.

Visualisation the process of mentally rehearsing a planned movement to learn skills or enhance performance.

For example, Swimmer Michael Phelps, winner of 28 Olympic medals, was encouraged by his coach, Bob Bowman, to visualise and watch a 'mental videotape' of himself competing and winning his races as often as possible throughout the day. Bowman said that he wanted his athletes to 'visualize in the most vivid way possible. I want them to smell the chlorine and see themselves swimming exactly the way they want to. Because the brain cannot distinguish between something that's vividly imagined and something that is real' (Faller, 2017).

Visualisation does not only help those on the sporting field; for example, surgeons utilise visualisation techniques in order to rehearse and prepare for surgery, musicians mentally rehearse their performance while holding their instruments, and dancers often mark out a routine in their minds to help consolidate the steps.



Figure 10.2 As Edward watched the spin bowlers, his mirror neurons fired and helped him to consolidate the skill and improve his technique.



Figure 10.3 Michael Phelps and his coach, Bob Bowman, frequently used visualisation to enhance his performance.

Did you know?

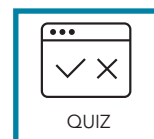
Visualisation can also help people recover from an injury. Most rehabilitation programs focus on physical recovery, but Rodriguez, Marroquin and Cosby (2019) wanted to investigate whether visualising movements that are not possible due to injury can assist in recovery and reduce the fear of re-injury and pain perception. Findings showed that visual imagery reduced the fear of re-injury and helped to reduce pain and promoted healing.

Activity 10.1**Learning a skill**

Identify a skill that you would like to learn. It could be juggling, saying the alphabet backwards or learning a new song. Over the next week, learn your skill using social learning theory, mirror neurons and visualisation. Write a reflection explaining how each element helped you to develop your skill.

Review 10.1**Learning to perform well**

- 1 Outline why some people believe that attention is the most important stage of social learning theory.
- 2 Define visualisation and explain how someone learning origami could use it to enhance performance.
- 3 Explain how mirror neurons can help children learn how to make their bed by watching their parents.



10.2 Improving performance

Marginal gains

The British Cycling Team won seven gold medals in track cycling at both the Beijing and London Olympics and three at the Tokyo Olympics. What was the key to their success? Many point towards British Cycling coach Dave Brailsford's application of the theory of **marginal gains**. He and his team broke down every element that was related to success and tried to make small improvements in each area.

Marginal gains the concept that small improvements in many individual processes can lead to a significant improvement when combined.

This included how athletes' equipment was stored, their diets and their sleeping patterns.

Individually, each factor's improvement was inconsequential but, when combined, the aggregated increase certainly was significant.

It might be counterintuitive, but instead of concentrating on the main goal, such as winning gold or getting a perfect score on a test, the theory of marginal gain focuses on continually making small improvements in a wide range of elements associated with the task. This approach can be seen in Ori's attempts to improve his grades.

Ori wants to study architecture, but he needs to improve his results. He has found the pressure of obtaining the results required to enter the course daunting and does not know where to start.

Instead of focusing on the score he needs, he has decided to review his routine and break down every element that could impact on his performance. This includes his study habits, behaviour in the classroom, how much time he spends on his phone and his diet. Here are some of the small changes that Ori plans to make in order to see whether, when combined, they have a positive impact on his results:

- review the notes I took in class for 15 minutes straight after school
- tidy my desk and organise my notes
- download and read through last year's exam papers
- be positive when I encounter a challenging topic and tell myself I can learn it
- stop drinking coffee after lunchtime and drink more water
- ask my Biology teacher for help in class when I don't understand a concept.

None of these strategies are particularly groundbreaking, nor are they likely to be the missing key that will enable Ori to achieve amazing results. However, if he continues to reflect upon the small improvements that he can make across a range of factors, it is likely that he will be much closer to reaching his goal. By focusing on smaller steps, Ori might find the challenge of achieving the results required to study architecture less daunting too.



Figure 10.4 Focusing on small improvements across several factors can help Ori achieve his academic goal.

Activity 10.2

Applying marginal gains

Think about an area of your own life that you would like to improve. Apply the theory of marginal gains and identify the marginal gains that you are going to focus on. After a week, reflect upon whether your small improvements have had a significant effect.

Locus of control

When it comes to success, training the brain is just as important as training the body. When we face a challenge, our mindset matters. How we interpret a situation, and the beliefs we hold, can have a significant impact on how well we perform. A key component of this is someone's **locus of control**. This refers to what people believe is responsible for causing the events in their life. Whether a person believes events are the result of internal or external factors impacts on how they prepare, compete and bounce back after disappointment.

Locus of control the degree to which a person believes they can control the outcome of events in their lives.

The following comments are examples of what someone with an external locus of control might say:

- 'It's not my fault I failed my maths test, my teacher didn't help me enough!'
- 'I didn't make it past the first round of auditions, because the piece they gave me was too hard.'

This person is more likely to believe they are not responsible for what happens in their life, and that they have little agency and control over events. They are unlikely to show perseverance and resilience when things get hard and will look for someone, or something, to blame. They are unlikely to acknowledge their own contributions when they succeed, too. However, it is important to note that external factors can be influential. The skill of the competition and the complexity of a history test are beyond the performer's control. Yet while these external factors might be influential, they do not determine how the person chooses to respond to the situation.

External locus of control**Internal locus of control**

Achievements and failures are attributed to factors outside the performer's control. They are likely to say they are lucky if they perform well, and blame their coach, the weather, the instrument or the opposition if they play badly or lose.

The individual takes responsibility for their own successes and failures. They believe their successes are due to their hard work and they can address the issues that lead to their failures.

Figure 10.5 Locus of control continuum

Research by Shepherd and colleagues (2006) indicated that a person's locus of control can have a relationship with academic results too. Shepherd found that students with higher academic results tended to correlate with people who had a stronger internal locus of control. Someone who takes ownership and believes they have agency over their life is likely to develop accountability, be reflective and work diligently to improve their academic results. However, having a strong internal locus of control can result in a person being too critical of their own performance and abilities, and not acknowledge that some elements are beyond their control. Therefore, it is important to not be too extreme on either side of the continuum.

Here are some ways to develop an internal locus of control:

- remind yourself that you can choose how you think and respond to a situation
- people can help you along the way, but ultimately it is up to you
- explore solutions you can implement when encountering a challenge.

Superstitions

The first time Amelia was successful at a piano audition she caught the bus and only had a glass of apple juice for breakfast. When preparing for her next audition, she became nervous. She realised that she was unable to do anything about some external factors, such as how strong the other auditionees were

and what the piano was like in the audition room, so she decided to think about what factors she could control, in this case her pre-audition preparation. Amelia chose to display an internal locus of control and actively took responsibility for her performance. However, because she was unable to control for the more influential external factors, she focused on managing less relevant and easily controlled factors instead. She realised that travelling via bus and drinking apple juice was a bit silly and that neither behaviour was linked to performing well. Nevertheless, she felt much calmer after getting off the bus with her empty apple juice container. By engaging in **superstitious behaviours**, Amelia believed that she had reduced the likelihood of external factors jeopardising her chances of success.

Superstitious behaviours actions that performers engage in due to the irrational belief that unrelated objects, events or actions can negatively influence an unrelated outcome.

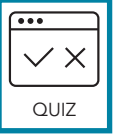
It worked! Amelia got the job. She now repeats these superstitions every time she auditions. In her mind, she has been rewarded for completing these rituals and believes that if she stops now, she will not succeed in the future.

Superstitions are common on the sporting field too. Tennis champion Serena Williams ties her shoelaces in the same way when she prepares for each match. She reported: 'I have too many superstitious rituals and it's annoying. It's like I have to do it and if I don't then I'll lose' (Evening Standard, 2007).



Figure 10.6 Serena Williams ties her shoelaces the same way before every match, in order to be able to display an internal locus of control over external factors.

Review 10.2



Improving performance

- 1 Roisin is hoping to break the school's cross-country record. Explain how she could apply the theory of marginal gains to improve her performance.
- 2 Jeannette and Felix have both been unsuccessful in receiving a promotion at work. Predict how Jeannette and Felix are likely to respond to the situation, given that Jeannette demonstrates an internal locus of control and Felix has an external locus of control.
- 3 Is Jeannette or Felix most likely to display superstitious behaviours next time they apply for a role? Justify your response.

10.3 What to do when things go wrong



Choking

Sofia is an accomplished baker and is very excited to appear on a TV cooking show. For her first task, Sofia has been asked to make a chocolate cake. Her Grandma taught her how to make one when she was eight, and she has made it thousands of times since. However, now she is in front of the judges and the television crew she cannot remember what to do. As she starts baking, her hands begin to shake; she cannot remember whether she put sugar or salt into the mixture and has accidentally dropped eggshells into the batter. Sofia has clearly '**choked**' during this baking round as she demonstrated a decreased performance due to being in a stressful situation.

Choking the failure of a person to perform as expected, given their skill level, especially when under pressure.

Sofia is not the only person to choke under pressure. Actors forget stage directions; singers forget the words to songs; and footballers miss

shots right in front of goal. The phenomenon of choking is often viewed as being due to psychological rather than physiological factors. There are several theories that attempt to explain why people choke under pressure.



Figure 10.7 Sofia struggled to perform as well as she usually does due to the pressure and stress she experienced.

Attentional theory – distraction theory

All Jack can think about as he prepares for the first round of his spelling bee is: 'I wish there weren't so many people in the audience.' One **attentional theory** is **distraction theory**. This theory suggests Jack may choke because his attention has shifted from the spelling task to an external factor – the crowd. He might also start to focus on internal worries too, such as: 'I must get this right or I'll be out of the competition.' Focusing on external factors or internal worries is not helpful as our ability to hold information in short-term memory is limited. Therefore, by focusing on these stressors, Jack is unable to pay attention to the strategies he had developed prior to the competition and is at risk of choking and not being able to remember how to spell the words correctly.

Attentional theories acknowledge that what we choose to focus on and what we think about before and during a performance have an impact on our performance.

Distraction theory proposes that pressure causes a diverting environment and draws attention away from skill execution, which can lead to choking.

Attentional theory – explicit monitoring

Explain, without using any actions, all the motor movements required to kick a football. Make sure you include the angle of the leg, where on your foot you need to kick the ball and how to coordinate the movements of your legs. Was this hard to do?

The second attentional theory, **explicit monitoring theory**, suggests that people choke because stressful situations cause them to over-monitor and explicitly process motor or cognitive tasks that are usually performed automatically without conscious awareness. People might explicitly over-complicate and think about how to do a procedural task in a similar way as was the case in the example above. This causes the behaviour to be too controlled and is usually detrimental to their performance. Explicit monitoring is associated with attention because when a person thinks consciously about how to complete the mechanics of the task, it takes up storage space

in the short-term memory, inhibits them from being aware of what is happening on the field around them, and prevents them from engaging in visualisation strategies.

Explicit monitoring theory proposes that pressure increases monitoring of tasks that are usually performed automatically, and can lead to choking.

Arousal theory – Yerkes-Dodson law

When the pressure to do well is high, it is more likely that someone will choke. That is why Li Jing's teacher recommends that she treats the exam like any other test. According to the **Yerkes-Dodson law** there is an optimal **arousal** zone, which, when she is in it, will allow Li Jing to demonstrate her best level of performance. However, if her arousal level is too high and she becomes too stressed, it will impair her ability to function, especially when asked to complete simple tasks. That is why she is concerned about misreading a question. The opposite is also true. If Li Jing was under-aroused, she might be too sleepy and not be able to pay attention to the questions, and her performance will also be compromised. The good news is that there are strategies that can prevent choking.

Yerkes-Dodson law proposes there is an optimal level of arousal for executing tasks to achieve the best performance.

Arousal theories acknowledge that the level of alertness we are experiencing when performing has an impact on how well we can complete the skills involved with the task.

How to overcome choking

Mindfulness

The aim of mindfulness is to be present and aware of your own thoughts, feelings and sensations. Engaging in mindfulness activities, such as meditation, activates the parasympathetic nervous system, which helps to calm down the body. This is likely to reduce the level of stress experienced and allow the person to return to the optimal arousal zone and therefore show high levels of performance again. It also helps the person to refocus on what they are paying attention to and consequently what is in their short-term memory. This can help the person, so they do not feel distracted or overly focused on the stressful task.

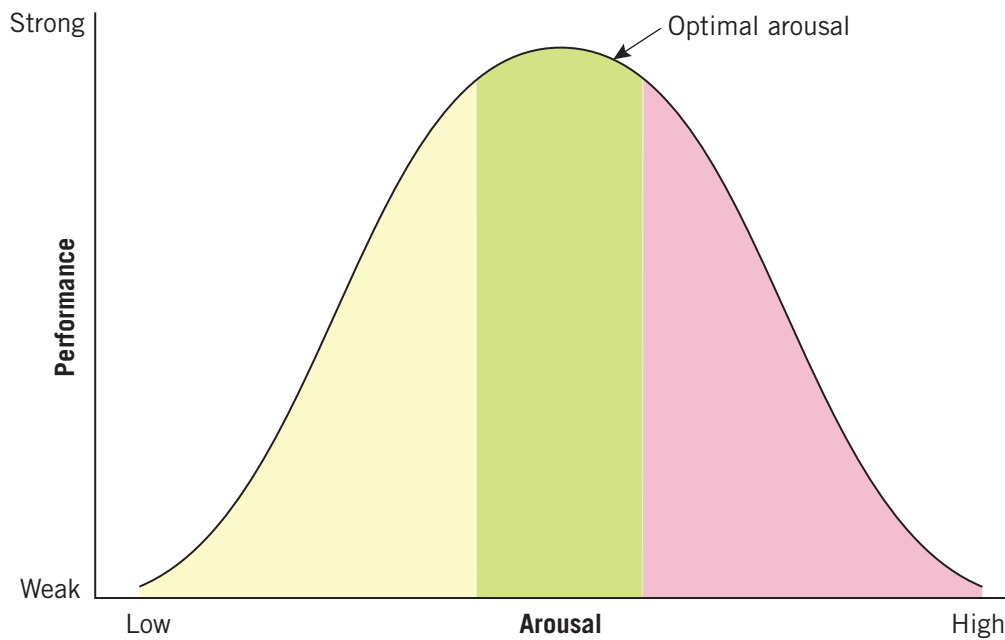


Figure 10.8 The Yerkes-Dodson law acknowledges that being over-aroused will result in a weaker performance.

Visualisation

As mentioned, visualisation is a strategy that many performers use when they prepare. They hope that by doing this in training regularly, it will reduce the risk of choking when it counts, because they have rehearsed their performance so often. However, if needed, they can use their mental imagery and visualise their success and refocus their attention.

Reframing the mind

While mindfulness can help to reduce physiological arousal levels, it might be beneficial to reframe the situation too and think about it as a challenge, focusing on the resources we have rather than focusing on the stressful elements of the task and the demands it requires.

Shifting the focus

Some athletes, like swimmers, cyclists and runners, focus their attention on the repetitive element of their sport. They might count their steps or strokes or repeat a key word such as 'strong' or 'stretch' in order to redirect their attention away from their tiredness, the crowd, and the pressure and focus on finding and maintaining their rhythm.



Figure 10.9 Controlling our thoughts and what we pay attention to is one of the best ways to reduce the risk of choking.

Imposter syndrome

Samara has begun an internship at an advertising agency, but she feels as though she does not belong and that she is not as smart, or as creative, as people think she is. She spoke to her friend Ahmet and confided in him that she's afraid that she won't live up to the expectations and is considering dropping out of the internship. Ahmet reminded her that she came



VIDEO
IMPOSTER
SYNDROME

first in the design competition at school. She dismissed this quickly and said that it was the new computer program that won her the award. Ahmet can't understand why she feels this way as it is contradictory to how he sees her.

This is a common example of **imposter syndrome**. Samara believes that her skill set is not sufficient when, in reality, she is competent and qualified for the position. This pattern of thoughts can be detrimental and can result in the person working harder to overcome the feelings of inadequacy and placing further stress on the need to be perfect. If she continues to tell herself this narrative, Samara is likely to experience a *self-fulfilling prophecy* and believe that she does not belong in the program. This may result in self-sabotage and Samara might withdraw from situations where she feels inadequate, such as the internship program.

Imposter syndrome involves feelings of self-doubt and inadequacy despite external evidence of competence.

How to overcome imposter syndrome

This is another example of when mindset matters. In most cases, the only person who does not believe they have the skills required is the person themselves. Therefore, it is important for Samara to challenge her beliefs and remind herself to:

- trust the people who selected her as they chose her for a reason

- make a list of all her positive attributes and achievements that make her qualified for the job
- practise learning how to take compliments from others
- focus on growth not perfection – the point of an internship is to learn, and no employer or coach expects people to know all they need to at the start
- remember that most people experience imposter syndrome at some point in their lives.

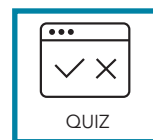


Figure 10.10 Imposter syndrome can limit a person's ability to flourish in a range of settings.

Review 10.3

What to do when things go wrong

- 1 Mateo was told that his class would be doing a fitness test that lesson. For him, this is the worst part of PE. During these tests, he is constantly worried that he is going to have the worst fitness level in the class and that his friends will make fun of him. He was quite upset at the end of the test, as he ran two levels lower than what he had last term.
 - a Explain why Mateo choked and underperformed, according to the distraction theory.
 - b If you were Mateo's teacher, describe two ways you could help him so he does not choke next time. Make sure you explain how that technique would help to reduce his stress levels.
- 2 Suzi has just been given the lead role in the upcoming school musical. She is adamant that there has been a mistake and that other people would be better suited.
 - a Define imposter syndrome and propose two examples of how Suzi might be viewing the situation.
 - b If Suzi continues to demonstrate imposter syndrome, predict the impact this could have on her performance.
 - c Describe two strategies that could help Suzi overcome imposter syndrome.



10.4 End-of-chapter test



Multiple-choice questions

- Chrissy's family is unsure why she has not improved her flute performance. She has a lesson every week. Her parents have offered to buy her a new flute if she receives an A in her upcoming examination. When her parents offered her this, she asked if she could play tennis instead. Which stage is not being met and is consequently impacting on Chrissy's performance?

 - A Attention
 - B Retention
 - C Reproduction
 - D Motivation
- Choking occurs when someone:

 - A Is learning a new skill
 - B Performs better than expected
 - C Performs worse than what their skill set would predict
 - D Performs as well as they normally would, even though they feel stressed
- Which of the following statements is incorrect? Mirror neurons:

 - A Allow people to learn vicariously
 - B Fire only when someone is physically completing a task
 - C Activate areas of the brain that are involved when physically completing a task
 - D Have been observed in humans, primates and birds
- Which of the following is likely to be thought by someone who is experiencing imposter syndrome?

 - A I've worked really hard and deserve my spot on the team.
 - B I'm not sure if the coach knows that I prefer to play defence rather than attack.
 - C Last time I played, the opposition was really strong, we are probably going to lose.
 - D I'm not as good as others in the team, I must have been chosen by mistake.
- Annamma has an internal locus of control. What is she likely to say when she is awarded first place in an art competition?

 - A The material worked well with the design.
 - B I'm glad that all my hard work has paid off.
 - C My teacher helped me and taught me how to paint the textures on the buildings.
 - D The competition must not have been that strong this year.

Short-answer questions

- Graham is about to take part in a hot dog eating competition. Explain how he could use visualisation techniques to help him win the trophy.
- Esma is a doctor who is trying to help overweight patients lose weight and become healthier. Define the theory of marginal gains and explain how the theory could help her patients lose weight, by referring to specific examples.

Extended-response questions

Nimisha is a psychologist who is interested in working with people to help them achieve their best in their chosen field using psychology. Today, she has a sports person, an artist, a musician and an academic coming to see her. She has too many clients at the moment and has asked you to choose a client and make some suggestions about how they could improve their performance. In the advice you provide to the client, refer to the following elements.

- 1 Describe how they could use social learning theory, mirror neurons or visualisation to develop their skills.
- 2 Discuss how the theory of marginal gains could improve their performance.
- 3 Explain how they could adopt an internal locus of control and ensure they do not develop imposter syndrome.
- 4 Propose some strategies they could use to help them if they choked during a performance. Be sure to explain why they might be choking.

Digital resources

Visit the Interactive Textbook to access:

- Chapter Checklist
- Interactive Scorcher Quiz
- Videos and other extra materials.



Figure 10.11 You can utilise the skills from this chapter to improve your performance in any of your own activities.

Glossary

acetylcholine an excitatory neurotransmitter that causes muscles to contract, and plays a role in attention, memory and learning.

acquired brain injury damage to the brain resulting from an accident or blow to the head.

addiction the physical and psychological inability to stop consuming a substance or carrying out an activity even though it is causing physical and psychological harm.

adenosine a neurotransmitter that is involved in the sleep process. A build-up of adenosine makes us feel sleepy and it is reduced by sleeping.

advocate someone who can support or argue for a person.

affective dimension relates to emotional state. An 'affect' is another way of describing an emotion.

agoraphobia the irrational fear of public or open spaces.

alcohol a depressant drug that is legal and the most commonly used drug in Australia.

alcoholism a condition where someone is dependent on or addicted to the consumption of alcohol.

antisocial dimension voluntary behaviour that breaks social norms and has no benefit to others, or shows disregard for others.

antisocial personality disorder (APD) a personality disorder (and mental illness) characterised by antisocial behaviour. It cannot be diagnosed until after the age of 18 years.

anxiety feeling of fear, nervousness and a lack of control, or a sense of impending doom.

anxiety disorder one of the most common mental illnesses diagnosed by clinicians and made up of many categories, such as eating disorders, phobias and generalised anxiety disorder.

apathy a lack of interest in activities; a state of indifference.

appeal an application for a decision to be reversed.

arousal theories acknowledge that the level of alertness we are experiencing when performing has an impact on how well we can complete the skills involved with the task.

aspartate the second most common form of excitatory neurotransmitter that plays an important role in focus, concentration, metabolism and general health of cells.

attachment the third stage of a romantic relationship where couples form a cooperative bond.

attention deficit hyperactivity disorder (ADHD) a mental health condition that is characterised by patterns of impulsiveness, inattention, hyperactivity and emotional regulation difficulties.

attentional theories acknowledge that what we choose to focus on and what we think about before and during a performance have an impact on our performance.

Australian Health Practitioner Regulation Agency (AHPRA) responsible for the registration and accreditation of 15 health professions across Australia, including psychology, medicine, nursing and dentistry.

Australian Psychological Society (APS) psychologists in Australia abide by its code of ethics.

autonomic nervous system a subdivision of the peripheral nervous system that contains the sympathetic and parasympathetic nervous system.

avoidant personality disorder a personality disorder whereby people experience significant social anxiety and social inhibition. It may lead to people withdrawing from society.

axon a cable-like extension from the cell body of a neuron that sends messages to other neurons.

axon terminals branch-like extensions of the axon at the end of a neuron that release neurotransmitters across the synapse to be received by other neurons.

barbiturates a type of narcotic; a form of depressant drug that has a sedative effect and can be highly addictive.

behavioural activities activities that require us to operate or act; a subtype of voluntary activities.

binge drinking ingesting several drinks at the one time; for men, five to seven drinks is considered a binge and for women it is three to five.

blackout a small period of amnesia experienced (when using alcohol) that occurs when the person is awake.

blue light a range of the visible light spectrum, with a wavelength of 400–95 nm. It is frequently emitted by technologies such as smartphones and tablets.

borderline personality disorder (BPD) a personality disorder (and mental illness) characterised by a long-term pattern of unstable relationships, distorted sense of self and strong emotional reactions.

brain plasticity a brain's ability to recover from damage.

case formulation a comprehensive analysis that builds a profile exploring why someone might have started and continued to engage in criminal behaviour.

central nervous system a subdivision of the human nervous system that contains the brain and spinal cord.

character strengths the sum total, or aggregate, of the characteristics that make us 'us'.

choking the failure of a person to perform as expected, given their skill level, especially when under pressure.

circadian rhythm a naturally occurring body rhythm that occurs once in a 24-hour cycle.

circumstances external life factors that contribute to 10 per cent of our overall happiness. They include things such as wealth, health and relationship status.

code of ethics a set of ethical guidelines that act as rules that professionals must abide by. If they breach the code, they can be deregistered.

cognitive activities activities that involve our thinking processes; a subtype of voluntary activities.

community treatment order (CTO) where a person is allowed to live in the community while they receive involuntary treatment.

conduct disorder a mental illness characterised by antisocial behaviour, including aggressive conduct, non-aggressive conduct, deceitfulness or theft, and serious violations of rules.

confederate a person who is part of the experiment and pretends to be a participant but is there to fulfil a specific role within the experiment. The true participants are unaware that the confederate is part of the research team.

confidentiality a person's right to have their name withheld and their information kept private.

cortex outer layer of the brain made up of grey matter where many processes take place, such as thinking.

culture the beliefs, values, practices and social behaviour of a particular group.

deep brain stimulation (DBS) a neurosurgical procedure where electrodes are placed deep into the brain in regions where electrical stimulation has the effect of alleviating symptoms of a disorder.

deep sleep therapy (DST) where a person is in a coma (unconscious state) induced by drugs.

delineation the way we mark our territory to separate it from another's.

dendrites branch-like extensions at the front end of a neuron that receive neurotransmitters from other neurons.

depressant drug a drug that slows down the body and brain and inhibits metabolism.

depression a mental illness characterised by sadness, loss of interest and pleasure in life, and other negative emotions.

discharge when an involuntary patient has been deemed by their psychiatrist to no longer fit the criteria of involuntary patient and is now free to leave the institution.

distraction theory proposes that pressure causes a distracting environment and draws attention away from skill execution, which can lead to choking.

DNA a molecule present in nearly all living things, that carries the genetic information responsible for cell development and function.

dopamine a neurohormone that plays a role in memory, learning, motor movements, motivation and addiction.

DSM-V *Diagnostic and Statistical Manual of Mental Disorders* (5th edition) is a diagnostic tool published by the American Psychiatric Association and widely used and accepted by clinicians around the world. Only qualified professionals can use the DSM-V.

dysfunction working abnormally or incorrectly.

ecological validity considers to what extent the findings can be generalised to the setting and the context they are being applied to.

electroconvulsive therapy (ECT) a form of medical therapy where low levels of electrical impulses are applied to an anaesthetised patient's skull (and brain).

electroencephalograph (EEG) a device that detects, amplifies and records the electrical activity of the brain.

electromyograph (EMG) a device that detects, amplifies and records the electrical activity of muscles.

electrooculograph (EOG) a device that detects, amplifies and records the electrical activity of muscles that control eye movement.

endorphin a neurohormone that acts as a natural painkiller in times of pain or stress. Endorphins can also cause people to feel better after strenuous exercise (a runner's 'high').

enkephalin a type of endorphin and a powerful opiate/painkiller created naturally by the human nervous system.

ethical conduct actions/behaviour of professionals that should follow their code of ethics.

ethics moral guidelines, or rules of conduct, that help us distinguish right from wrong.

euphoric a feeling of intense happiness or excitement.

excitatory a type of neurotransmitter that increases the overall activity of a neuron, making it more likely to fire.

explicit monitoring theory proposes that pressure increases monitoring of tasks that are usually performed automatically, and can lead to choking.





fight-flight-freeze response physiological response to threat or intense excitement; causes the release of adrenaline in the body.

flirting non-verbal signals that suggest someone is ready to engage in an exchange with another person.

fMRI a brain scan that can identify the structures of the brain, as well as parts of the brain that are active when completing a task.

focal lesion a small piece of the brain is removed or destroyed – this can be done either by cutting, freezing, heating or irradiating.

forensic of or relating to a criminal offense.

frenemy a type of friend whose behaviours bring you down, whether this is intentional or not; or someone with whom you are friendly, but there is an underlying rivalry or competing interest to the friendship.

GABA the most common inhibitory neurotransmitter that plays a large role in calming or quieting the central nervous system.

gambling an activity involving chance, where a person risks money in order to win.

generalised anxiety disorder (GAD) an anxiety disorder that is more common among teenagers than adults, but can also begin in childhood. GAD is more common in girls than boys.

gesture any movement of the forearm, hand, wrist or finger used for communication.

glutamate the most common excitatory neurotransmitter that plays a large role in memory and learning.

grey matter cell bodies (soma) of neurons.

happiness is a sense of pleasure and satisfaction with one's life and a sense of purpose and connectedness. It is sometimes also referred to as wellbeing.

holistic approach in psychology, a whole range of biological, cognitive and social factors must be considered when trying to determine what might be causing a behaviour.

homeostasis the process by which the body maintains equilibrium in its biological processes.

homunculus Latin for 'little human'; a representation of a person used to illustrate the proportions of cortical space allocated to each body part.

humanistic psychology proposes that all humans are driven by a desire to grow and reach actualisation.

hyperactivity excessive movement that is not appropriate or fitting to the environment.

idiopathic any disease that is of uncertain or unknown origin.

imposter syndrome involves feelings of self-doubt and inadequacy despite external evidence of competence.

impulsiveness hasty acts that are made on the spur of the moment and without thought.

inattention not being able to maintain focus.

infatuation the second stage of romantic relationships, where couples tend to focus on the positive aspects of their partner and ignore those that don't fit with their expectations.

inhibitory a type of neurotransmitter that decreases the overall activity of the neuron, making it less likely to fire.

insomnia the inability to fall asleep or stay asleep when needed.

integrity the quality of being consistent, reliable, reflective of values and demonstrating 'doing the right thing'.

interpersonal dimension a person's ability to relate to and connect with other people.

invincible a feeling of being too powerful to be defeated or overcome.

involuntary patient a person who is receiving involuntary treatment deemed necessary for their benefit.

involuntary treatment refers to where a person receives treatment for their illness without consent either in a hospital or community setting.

involuntary treatment order a recommendation by a health professional (usually a doctor) for a person to be taken care of by the state because they either refuse treatment for their mental illness or are unable to look after themselves.

K-complexes single sharp spikes in a low-voltage series of brain waves.

leucotomy surgery that cuts through the white matter in the prefrontal lobe in the brain. In practice, there is little difference between a leucotomy and a lobotomy.

lifestyle dimension how a person usually behaves, their way of living.

liver cirrhosis damage and scarring of the liver, which can lead to liver disease.

lobotomy (also known as frontal lobotomy or leucotomy in Australia) neurosurgery that disconnects the nerves of the frontal lobe from the rest of the brain. This procedure is no longer performed.

locus of control is the degree to which a person believes they can control the outcome of events in their lives.

longitudinal study a research investigation that involves the study of the same cohort over a sustained period of time (months or years).

lust the first stage of romantic relationships, where couples are attracted to each other and flirt with each other.

marginal gains the concept that small improvements in many individual processes can lead to a significant improvement when combined.

Medical Board of Australia organisation that regulates all medical practitioners in Australia.

melatonin a special sleep hormone that is released at night to help us feel sleepy. Its levels drop in the morning to help us feel more alert.

mental health the state of wellbeing of a person, including their ability to cope with stressors, work productively, and understand their own capabilities and contributions to the community.

mental health literacy the knowledge and beliefs about mental health issues that help people recognise, manage or prevent mental health conditions.

mental illness a health problem that significantly affects how a person thinks, feels and behaves.

#MeToo movement a social movement against sexual abuse and harassment that aims to empower sexually assaulted individuals through empathy and solidarity by visually demonstrating how many people have experienced sexual assault. The term was first coined in 2006 by Tarana Burke.

mindfulness a mental state of being present and engaged in the moment, while being aware and accepting of our thoughts and feelings.

mirror neurons specialised neurons in the brain that fire when someone performs an action but also when they view that action being performed by someone else.

motor neurons special types of neurons that carry messages out from the brain and through the body. Motor neurons carry messages for involuntary and voluntary motor movement.

multiple relationships (also known as 'dual relationships') when a psychiatrist or psychologist has a patient who is also their friend, colleague, student, trainee or intimate.

multiple sclerosis (MS) one of the most commonly occurring neurological diseases in the world, which causes the immune system to mistakenly attack the myelin sheath, producing scarring of the axon.

myelin sheath fatty, white insulating tissue that surrounds the axons of neurons.

narcosis a state of drowsiness, sleep or unconsciousness caused by drugs.

narcotics any drugs that induce narcosis or decrease sensitivity to pain, such as opiates.

neural impulse the messages that travel along a neuron that are both electrical and chemical in nature.

neurocriminology uses neuroscience methodologies such as brain imaging techniques to understand and explore how the nervous system can explain criminal behaviour.

neurohormone a chemical substance that is able to act as both a neurotransmitter in the synapse and a hormone in the bloodstream.

neurological disease any disorder that affects the brain as well as the nerves found throughout the human body.

neuron the fundamental building block of the brain and nervous system, a cell responsible for relaying information throughout the body in the form of electrochemical signals.

neuroses an abnormal condition of the mind characterised by high levels of stress such as depression and anxiety, but not a total loss of touch with reality.

neurosurgery in the context of psychiatry, an operation on the brain rarely used to treat severe mental illnesses that have not responded to other treatments.

neurotransmitters chemical messengers released by the axon that travel across the synapse (a gap) to the dendrites of neighbouring neurons.

non-rapid eye movement (non-REM) sleep stages 1 to 4 in the sleep cycle.

noradrenalin a neurohormone that plays a role in mood, sleep and blood pressure. Low levels of noradrenalin have been linked to depression.

normal the average, custom or standard level of something. In psychology, it means being 'free' of mental or physical disorders.

onset beginning point.

oxytocin a hormone released that helps strengthen the bond between people.

paruresis the irrational fear of using a public toilet to urinate.

performance psychology a subfield of psychology that examines factors that influence optimal human performance.

personal space the amount of distance we need to maintain between ourselves and the people with whom we are interacting.

personal space zones the areas of space around us that we try to maintain: intimate distance, casual-personal distance, social-consultative distance and public distance.

personality disorder a mental disorder characterised by a pattern of thinking and feeling about themselves and others that can have a negative impact on a person's life and functioning.

personality traits personality characteristics that each person has that are unique to them.

pessimism a tendency to focus on the negatives or to think the worst will happen.

pineal gland a small gland found deep within the brain and responsible for sleep and hormone development.





polysomnography the measurement and recording of different body functions during sleep.

positive psychology the domain of psychology that specialises in helping people improve their sense of wellbeing and happiness.

positron-emission tomography (PET) scan a functional brain imaging technique that indicates the activity level of areas in the brain. Red and yellow indicate high activity, while purple and blue indicate less activity.

primary territory any area that is used exclusively by an individual or group over a long period of time.

problem gambler when a person cannot control the urge to gamble and this is having a negative impact on their life.

prosocial voluntary behaviour intended to benefit another, such as helping, sharing and comforting others.

protective factors attributes or exposures that can decrease the likelihood of a person developing a mental illness.

proxemics the study of personal space rules.

pruning death of synapses due to disuse of neurons.

psychic-driving a method used by Dr Ewan Cameron to reprogram the mind of a sedated patient by playing them hours of commands on tape. This method also became known as brainwashing.

psychopath a person who suffers from psychopathy. They tend to be impulsive and reckless and show little remorse or guilt for antisocial behaviours.

Psychopathy Checklist Revised (PCL-R) a diagnostic tool for measuring psychopathy; created by psychologist Robert Hare.

psychosis an abnormal condition of the mind; a generic psychiatric term for a mental state often described as involving a 'loss of contact with reality'. It may be characterised by hallucinations or delusions.

psychosurgery an outdated form of neurosurgery to treat symptoms of mental illness, commonly used during the 20th Century.

purposeful activity any activity that gives people meaning and satisfaction with their life.

rapid eye movement (REM) sleep a stage of sleep characterised by quick eye movements and beta-like, or 'sawtooth', brain waves. Most dreaming occurs in REM.

relaxation technique a technique that can be used to improve mental health and quality of life.

REM rebound the increased amount of time spent in REM following a period of REM deprivation.

restless leg syndrome (RLS) a neurological disorder characterised by an unpleasant and uncomfortable feeling in the legs when lying down and a consequential desire to move or kick them.

restraint a process by which a person's freedom to move is restricted.

restrictive practices refers to the use of seclusion and restraint in mental health settings.

risk factors attributes, or exposures, that increase the likelihood of a person developing a mental illness.

Royal Australian and New Zealand College of Psychiatrists (RANZCP) psychiatrists in Australia abide by its code of ethics.

Royal Commission a major government public inquiry into an issue.

seclusion a process by which a person is placed in a room by themselves where the windows and doors are locked on the outside.

secondary territory any area that is used regularly by an individual or group but is also used often by other people.

self-fulfilling prophecy occurs when a person internalises the labels that have been placed upon them and believes they are true. This then results in exhibiting behaviours that are consistent with the label.

sensory deprivation where a person is placed in a room with no sensory stimulation (e.g. dark empty rooms, or bright white rooms with no windows or people).

serotonin a 'feel good' neurohormone that regulates mood, wellbeing, the digestive system and sleep.

set point of happiness personal level of happiness that is genetically determined and therefore unique and stable (unchanging) for each person.

sleep a state of consciousness during which the individual is unresponsive to external stimuli and experiences a state of immobility.

sleep deprivation not getting enough sleep for our requirements.

sleep hygiene developing good sleep practices that promote sleep.

sleep spindles short bursts of high-frequency activity in brain waves.

social capital the time we have to devote to social interactions.

social learning theory proposes that new behaviours can be acquired by observing and imitating others.

socio-biological psychology a branch of psychology that tries to explain people's behaviour from an evolutionary perspective.

socio-cognitive psychology a branch of psychology that tries to explain, and also provide information on, people's behaviour through the thoughts and ideas that accompany it.

sociopathy a term that can be applied to a person suffering from antisocial personality disorder (APD).

soma the cell body and control centre of a neuron, containing its nucleus and DNA.

sprouting growth of dendrites during learning.

stigma social disapproval of a person due to a personal characteristic.

stimulant drug a substance that speeds up messages going to and from the brain, keeping a person awake and alert.

stressor an object, or an event, that causes stress.

superstitious behaviours actions that performers engage in due to the irrational belief that unrelated objects, events or actions can negatively influence an unrelated outcome.

synapse a small gap between neurons.

territory the fixed spaces that somehow belong to us or a group to which we belong.

tertiary territory (public territory) shared spaces that everyone has the right to use.

threat simulation theory proposes that dreams prepare us for facing threatening situations in real life by allowing us to rehearse them in our dreams.

transporters specialised cells that are responsible for collecting neurotransmitters and neurohormones present at the synapse and repackaging them for use at a later time.

ultradian rhythm a naturally occurring body rhythm that occurs more than once in a 24-hour cycle.

valid consent where a person is informed so that they understand the nature, risks and purpose of treatment or research they will be receiving in the future, and they agree to it.

visualisation the process of mentally rehearsing a planned movement to learn skills or enhance performance.

volitional activities activities that we choose or decide to take part in; a subtype of voluntary activities.

voluntary activities activities that are intentional, that an individual chooses to do. These contribute around 40 per cent of our happiness.

whānau Māori term in New Zealand, meaning family and extended family in the community.

white matter axons of neurons insulated by the fatty white myelin sheath.

Yerkes-Dodson law proposes there is an optimal level of arousal for executing tasks to achieve the best performance.



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Acknowledgements

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