

Edexcel GCSE (9–1) **Psychology**

Christine Brain Anna Cave Karren Smith

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Welcome to Edexcel GCSE (9–1) Psychology

Exploring human behaviour

The new Edexcel GCSE course will help you to develop your knowledge and understanding of a wide range of topics in psychology. Using a ‘key question’ approach, such as ‘How does your memory work?’ and ‘How do others affect you?’, it investigates areas of human behaviour and allows you to relate them to your own experiences.

There are many benefits to taking the Edexcel GCSE Psychology course.

- It encourages you to carry out practical experiments and investigations where possible – helping to bring the subject to life.
- It includes contemporary studies that are relevant to today’s generation of students.
- If you do well in this course you will be in a good position to progress to further study of psychology at AS or A level. The content of this GCSE is ideal grounding for these qualifications, and it has been designed using a similar approach in order to make the experience of moving on as smooth as possible.

How you will be assessed

The GCSE course consists of compulsory and optional topics. You will study six compulsory topics and two optional topics (which your teacher will choose).

Your assessment will consist of two separate written exams. Paper 1 covers compulsory topics 1 to 5 and accounts for 55 per cent of the total mark. Paper 2 covers the optional topics. It is worth 45 per cent of the final mark. Both papers include questions covering the content of Topic 11 *Research methods*.

How to use this book

This book contains all the information you need for the topics, theories and studies you will be learning about. It also covers the key issues and debates relating to each of the compulsory topics. Each section guides you through the content of the course in a practical and engaging way, making it clear what you will cover and providing useful activities and questions to help you practise what you have learned. There are two dedicated sections to help you prepare for the exams.

The book is organised as follows:

- compulsory topics 1 to 5
- Preparing for your exam (Paper 1)
- compulsory Topic 11 *Research methods*
- optional topics 6 to 10
- Preparing for your exam (Paper 2).

Topic 11 *Research methods* has been positioned between the compulsory and optional topics, since you will need to draw on the research methodologies described in both of your exam papers.

Features of the book

In this student book there are lots of different features. They are there to help you learn about the topics in your course in different ways, to understand it from multiple perspectives and to get the most from your learning. These features, together with examples of each one taken from the book, are explained below.

- **Exploring the topic** – a key question is explored briefly at the beginning of each topic, to get you thinking about relevant issues before you start.
- **Your learning** – a summary at the beginning of each topic that outlines exactly what you are going to learn.

Your learning

In this topic you will learn about:

- early brain development
- Piaget's stages of development and their role in education
- Piaget's theory of cognitive development.

- **Getting started** – an activity or a few questions to check what you may already know about the topic and to encourage reflection or broader discussion.
- **What you will learn** – a short bullet point list of exactly what is covered in each section.
- **Key terms** – there are certain terms that you need to know and be able to explain. Key words that are explained within the main text are in **bold** to emphasise their importance. They are explained in the nearby Key terms boxes.
- **Apply it** – this feature allows you to practise applying a theory or concept you have learned to a specific task or question.
- **Try it** – opportunities to build your practical research/ investigative skills by trying something for yourself.
- **Develop it** – activities or tasks that encourage you to think more broadly across the subject of psychology and develop your skills further.
- **Link it up** – these features show you how different parts of your course link together.

- **Sum it up** – this gives a short conclusion about the study you have been learning about.
- **Exam-style question** – these questions match the style of questions that you are likely to find in the written exams and give you useful practice as you go through your course.

Exam-style question

Define what is meant by 'egocentrism'. **(2 marks)**

- **Exam tip** – hints and tips to aid your learning and help you in the exams.

Exam tip

When asked to 'define' something, provide a statement showing exactly what it means. Using an example can help to illustrate the meaning.

- **Maths tip** – hints and tips to help you complete mathematical tasks.
- **Psychology in action** – examples of how psychology affects everyday life; these features help to set a topic in context so you can understand its wider relevance.

Preparing for your exam

Dedicated exam preparation sections with tips and guidance for success in your written exams. You'll find example questions and answers, together with notes and explanations about the quality of the answers shown. This will really help you build your understanding of how to write stronger answers.

Supporting materials

Answers to exam-style questions, as well as the full Glossary of Key terms included in this Student Book, can be downloaded from the Pearson GCSE (9-1) Psychology resources website at www.pearsonschools.co.uk/edgcsepsych17support.

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Topic 1 | Development – How did you develop?

Exploring the topic

Are you wondering why it is important to know how we develop? Development underpins everything we do, what we say, our attitudes and our beliefs throughout our lifetime. It is fundamental to understanding humans. Most people would agree that it is important for us to know more about how we become who we are. This is partly determined by what we are born with and partly influenced by what happens to us.

How much do you know about your own development? You probably realise that you developed abilities as you got older, such as being able to do puzzles that you could not do when you were younger.

You probably also know what people have said you are good at and what you think you are good at; however, psychology suggests that this very knowledge can hinder your development. When someone challenges us to improve at something, we generally do better. Or you might have found that you become better at something, such as a sport or a different skill, by practising and putting in effort.

Many psychologists have researched these aspects of development and we will be exploring these in more detail in this topic.

Your learning

In this topic you will learn about:

- early brain development
- Piaget's stages of development and their role in education
- Piaget's theory of cognitive development
- Dweck's mindset theory and the effects of learning on development
- Willingham's learning theory and the effects of learning on development
- development studies by Piaget and Inhelder (1956) and Gunderson et al. (2013)
- issues and debates around the development of morality.

Getting started

You can start by investigating your own development, which will help you to understand the theories you will be learning about. Here are some ideas of how you could do this.

- Informally interview someone who knew you when you were young and ask them what you were like as a 2-year-old compared with when you were 7 years old. What could you do and what could you not do at these ages?
- Talk to someone of your own age about their development and how it differed or was similar to your own.
- Perhaps gather information from other students in your class to see if gender seems to have affected development and in what way.



How could your age, upbringing and experiences affect your development?

Development – How did you develop?

Early brain development

What you will learn

- How the forebrain, midbrain and hindbrain develop in the foetus.
- The development of the cerebellum and medulla.

The **brain** and connections within it are very complex. While not everything about it is known, there is some current understanding about how the brain develops.

Development of the midbrain, forebrain and hindbrain

When the foetus is about 3 or 4 weeks old, a long tube develops in the brain, which is divided from the front into three distinct round sections. In order from the top, these are the **forebrain**, **midbrain** and **hindbrain**. Below the hindbrain is the spinal cord. By 5 weeks old, the forebrain and hindbrain have each split into a further two cavities (giving five in total); the forebrain splits into an **anterior** (front) and a **posterior** (behind) section and the hindbrain splits through the middle. The midbrain does not divide.

Development of the cerebellum and medulla

The **cerebellum** ('little brain') can be seen in the foetus at about 6 weeks and a year after birth the cerebellum is three times the size. The cerebellum controls physical skills which develop a lot over this time, possibly accounting for the growth of the cerebellum. The cerebellum is involved in responses such as fear, and in functions such as processing sense information.

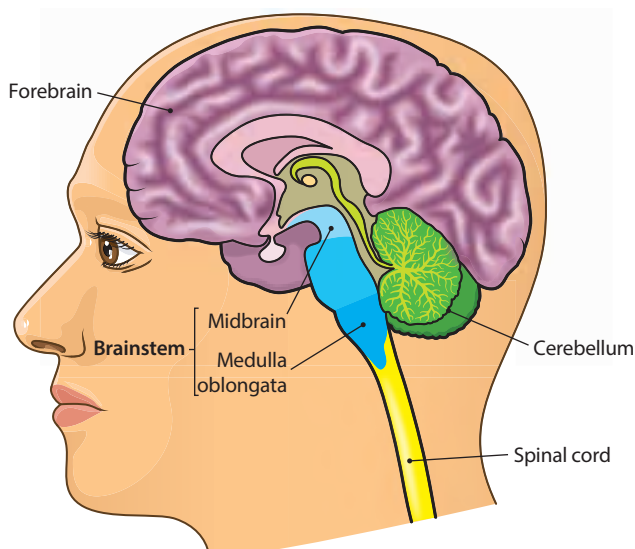


Figure 1.1 The divisions of the brain

The **medulla oblongata** (also known as the medulla) is in the hindbrain in front of the cerebellum. It controls **involuntary responses** such as sneezing and breathing, as well as heart rate and blood pressure. It has formed by the time the foetus is 20 weeks old, and connects the rest of the brain to the spinal cord (Figure 1.1).

Building neural connections from birth

A key part of a baby's brain development is the huge increase in the number of **neural connections** from birth to 3 years old, with 700–1000 new connections forming every second. These connections allow for very fast communication between the many different parts of the brain. The brain doubles in size over the first year and reaches 80 per cent of its size by the age of 3 years. Early connections are said to be of great importance and are reinforced by use, so it is important that babies get plenty of stimulation.

Link it up

The structure and function of the brain are explained in more detail in Topic 4 *The brain and neuropsychology*.

Key terms

Brain: the organ in your head made up of nerves that processes information and controls behaviour.

Forebrain: the anterior part of the brain, including the hemispheres and the central brain structures.

Midbrain: the middle section of the brain forming part of the central nervous system.

Hindbrain: the lower part of the brain that includes the cerebellum, pons and medulla oblongata.

Anterior: directed towards the front, when used in relation to our biology.

Posterior: directed towards the back, when used in relation to our biology.

Cerebellum: an area of the brain near to the brainstem that controls motor movements (muscle activity).

Medulla oblongata: connects the upper brain to the spinal cord and controls automatic responses.

Involuntary response: a response to a stimulus that occurs without someone making a conscious choice. They are automatic, such as reflexes.

Neural connections: links formed by messages passing from one nerve cell (neuron) to another.

Piaget's stages of development and their role in education

What you will learn

- Piaget's four stages of development.
- The role of the stages of development in education.

Piaget's four stages of development

As part of his theory of how thinking develops, called the 'theory of **cognitive** development', Jean Piaget suggested that we go through distinct stages of development. Each stage is fairly long and our thinking abilities do not change much during these stages. A change in thinking indicates when the next stage is reached. During the transition from one stage to another, features of both stages are sometimes there in a child, and sometimes not. During each stage there is consolidation of developing abilities in preparation for the next stage.

The name of the first stage relates to the way babies use their senses and movements. The other three stages bring in the idea of '**operations**'. Mental operations refer to how we reason and think about things, such as sorting building blocks into size order. It might help to think of operations as reasoning.

Sensorimotor stage (birth to 2 years)

Infants use their senses and movements to get information about their world. At first they live in the present rather than understanding time and space around them. They learn by linking what they see, hear, touch, taste or smell to objects they are using, for example by grasping and sucking objects. They begin with reflex actions and then learn to control their movements. At around 6 months, they develop **object permanence**, which means they learn that objects exist even when they cannot see them. By the end of this stage, the child has a sense of themselves as existing separately from the world around them. An interesting part of this stage occurs from around 4 months old, when children repeat actions, such as dropping something deliberately that they first dropped by chance.

Try it

If you have the opportunity to watch a baby aged 4 to 6 months old, carry out an informal observation. Ask for parents' permission and make sure the baby remains happy; this can be taken as a sign of their permission. Watch to see if the baby repeats actions. Look too to see if they show an understanding of object permanence. To do this, as a form of play, try showing the baby a ball (or the parent can do this). Make sure they are looking at it, then deliberately hide it under a blanket, with the baby watching all the time. Does the baby look for the ball under the blanket? That means they know the ball exists even when they cannot see it. If you are unable to observe a baby, you could watch a YouTube video on object permanence and the sensorimotor stage of development.

Key terms

Cognitive: thinking, including problem-solving, perceiving, remembering, using language and reasoning.

Operations: how we reason and think about things.

Object permanence: knowing something exists even if it is out of sight.

Pre-operational stage (2 to 7 years)

There are two stages within the pre-operational stage, the symbolic function stage and the intuitive thought stage.

The symbolic function stage (2 to 4 years)

Children start imitating others and can use objects as symbols. **Symbolic play** involves using one object to represent different objects, such as using a box as a stool and using role play. Children think in pictures and use symbols. They start to use words as symbols for objects, which is the beginning of language development. Children see the world through their own eyes, not through someone else's (this is known as **egocentrism**). **Animism** can also be seen where children believe objects can behave as if they are alive.

Intuitive thought stage (4 to 7 years)

This is the start of reasoning. Children ask a lot of questions as they realise that they know a lot and want to know more. They can only consider one aspect when

Development – How did you develop?

something is complex (this is known as **centration**). Conservation is not yet achieved – children do not realise that changing how something looks does not change its volume, size or weight. There is also **irreversibility**, referring to a child not being able to use thought to reverse events, such as knowing that if water from a wide glass is poured into a tall glass so it looks as if there is more water, when the water is poured back into the wide glass it will look the same as it did.

Concrete operational stage (7 to 12 years)

Children begin to apply rules and strategies to help their thinking and use concrete objects to aid their understanding (for example, using counters to find the answer to a sum). They have difficulty with abstract ideas such as **morality**.

Abilities in this stage include:

- seriation – sorting objects, such as into size
- classification – naming and identifying objects according to size or appearance
- reversibility – for example, if they know that two bricks plus four bricks gives six bricks, they will know that six bricks minus two bricks gives four bricks
- conservation – they know that length, quantity or number are not related to how things look. If the shape is changed, for example, making the quantity look different, children know that the quantity is still the same
- **decentration** – the ability to take multiple views of a situation (conservation relies on this).

Formal operational stage (12+ years)

In the concrete operational stage children's thinking is about controlling objects and events in the world. In the formal operational stage there is control over thoughts themselves. Young people can think about more than two things, such as thinking about height, age and gender when describing a person. They also have the ability to think about how time changes things, such as how as they get older they might not still live in the same town. They can also understand that events have a sequence, such as moving from school to college and then to work.

In this stage a young person can see that actions have consequences, such as how drinking alcohol can lead to dangerous behaviour, such as driving and killing someone.

There is also the understanding that they and others exist in the real world and separate from each other.

Using Piaget's stages in education

Piaget's theory has been applied to classroom practices. His theory suggests that children's actions and interactions affect their thinking, and that they cannot do certain things until they reach the appropriate stage of development. For example:

- Young children are egocentric and cannot understand the teacher's viewpoint so might not do as they are told because of their lack of understanding. They are not being naughty.
- Children build their own **schemas** (representations of the world) from their own experiences and so they individually build their own knowledge and understanding.

Exam-style question

Define what is meant by 'egocentrism'. **(2 marks)**

Exam tip

When asked to 'define' something, provide a statement showing exactly what it means. Using an example can help to illustrate the meaning.

Key terms

Symbolic play: children play using objects and ideas to represent other objects and ideas.

Egocentrism: unable to see the world from any other viewpoint but one's own.

Animism: believing that objects that are not alive can behave as if they are alive.

Centration: focusing on one feature of a situation and ignoring other relevant features.

Irreversibility: not understanding that an action can be reversed to return to the original state.

Morality: general principles about what is right and wrong, including good and bad behaviour.

Schema/schemata(s) (development): mental representations of the world based on one's own experiences. The plural of schema is 'schemata' though 'schemas' can also be used and is more common.

To help sensorimotor development

Children are treated as individuals. They are provided with a lot of stimulation and materials to practise skills and to build schemas. Children are practising their sensorimotor skills and they get information from their senses. Smells, tastes, sights, sounds and different textures can all be provided as stimulation. Colour is important and often bright colours are used as young children can more easily distinguish them. Human voices are responded to, as is music and other sounds.

Singing and rhythm can stimulate children and can help in language development. Having the opportunity to explore with the mouth is valuable for learning about shapes and taste. Providing different textures, which can also mean hearing different sounds, is also useful stimulation.

Stimulation helps children engage with the world and build schemas or ideas, which is how they learn.

To help pre-operational development

Children must 'do' things to learn and to keep building schemas, rather than watching someone else performing actions. They need a lot of experiences to extend their understanding as they focus on just one part of a problem at a time.

Children are seen as little scientists, building ideas through experimenting with reality and they need equipment to experiment on. Children are encouraged to learn by discovery through interacting with their environment, not by being told things. Their individual learning must be encouraged and developed, acknowledging that different children are at different stages in their development. Models, objects and visual aids such as drawings and diagrams can help learning, while instructions are kept short.

To help concrete operational development

Teachers can ask children to concentrate on more than one aspect of an issue. Teachers can assume children can understand different viewpoints from their own, and so the teachers will structure tasks accordingly.

To help formal operational development

Children can discuss abstract concepts and be asked complex questions involving mental reasoning.

For example, they can be asked to think about how their different roles might conflict, such as how being a son and a friend can mean they have to make a decision about a course of action. They realise they belong to different groups which have different norms and they can explore such norms to see that different people have different ideas from their own. Children in this stage study different school subjects such as science and arts, and these can help them to distinguish the different ways of thinking about the world.

Implications for teaching

Robert Slavin (2005) suggested implications for teaching that come from Piaget's stages.

- There should be a focus on the child's thinking and not what they can do. It is the processes they use, rather than the right answer, that is important.
- Discovery learning is required and children must be able to engage freely with their environment rather than being told facts.
- Teaching should accept and acknowledge that children do not think like adults and that they develop at different rates.
- Children are individuals and go through the stages in different ways, so classrooms must be managed to suit all individual children and whole-class teaching is not advised.

Apply it

Freda and Simon can do different things. Simon can put pens into size order. Freda can work out which is the slowest and which is the fastest if she knows that a horse can run faster than a dog and a dog can run faster than a hedgehog. Explain which stage each child is in according to Piaget's stages of development.

Develop it

Find out how pain management for children can be helped by understanding the stages of development. For example, how might a 4-year-old child view pain? One example is that a young child may associate 'headache' with pain anywhere in the body, which health professionals might find useful to know. See if you can find other examples and relate them to Piaget's stages.

Development – How did you develop?

Piaget's theory of cognitive development and the development of intelligence

What you will learn

- How children develop mental processes for learning, so that children develop intelligence.
- The strengths and weaknesses of Piaget's cognitive development theory.

Piaget's explanation of understanding the world

Piaget held that children develop through **adaptation** – they adjust to the world as they experience new things. As they develop, babies have to understand many new things. They do this by forming ideas about how things are in the world. Their ideas take the form of schemas (schemata) or plans through which they represent the world, such as a schema for 'things dropping when they are let go'. Often they can fit new things into their existing schemas about the world. However, as they experience more, they need to change their schemas and create new ones.

Piaget's theory and the development of intelligence

The development of intelligence is about building knowledge and skills. Intelligence is acquired through stages of development, such as developing object permanence and formal reasoning (see Piaget's four stages of development in the previous section). Intelligence is developed through building schemas via adaptation and through the four stages of cognitive development (Table 1.1).



How might a child's ideas about birds and aeroplanes change as they develop?

Link it up

Bartlett explored how schemas are formed in reconstructive memory. Find out more about schemas in Topic 2 *Memory*.

Key terms

Adaptation: using assimilation and accommodation to make sense of the world.

Assimilation: incorporating new experiences into existing schemas.

Accommodation: when a schema has to be changed to deal with a new experience.

Equilibrium: when a child's schemas can explain all that they experience; a state of mental balance.

	Meaning	Example
Schemas /schemata	Plans and patterns are formed about what we experience. Mental structures give us frameworks to understand the world.	A student has a classroom schema. On entering a classroom, they would expect to see a board for writing on, some chairs and tables, a desk at the front and fire safety instructions.
Assimilation	Incorporating new experiences into existing schemas.	A young child develops a schema for birds flying and, seeing an aeroplane, calls it a bird.
Accommodation	A schema no longer works and has to be changed to deal with a new experience.	The child will see that birds are alive and aeroplanes are not, and so they will need to change their 'everything that flies is a bird' schema.
Equilibrium	When a child's schemas work for them and explain all that they experience, the child is in equilibrium. They are in a state of mental balance.	The 'bird' schema is changed. Aeroplanes are included, and the child understands that they are metal and carry passengers, thus moving from disequilibrium into a state of equilibrium.

Table 1.1 Explaining Piaget's theory of cognitive development

Try it

This task highlights the importance of using mental representations of the world to make sense of it. Gather together some participants, keeping to ethical principles. For information on ethical principles, see Topic 11 *Research methods*. Ask your participants to read the passage below and rate how clear it is.

It takes two people because one has to give instructions to the other. They have to practise beforehand so that they know where to turn and what might be dangerous. Others also take part but at a different time. The aim is to go as quickly as possible.

Then tell them that the passage is about rally driving and ask them to rate its clarity again.

Strengths and weaknesses of Piaget's theory

Piaget's work has practical applications, thus strengthening the theory. Discovery learning draws on Piaget's ideas about focusing on the individual child's stage of development when helping their learning. When children are allowed to discover things at their own pace, they are able to build knowledge using schemas and can work according to their stage of development.

Another strength is that Piaget's work has generated a great deal of research, including experiments, to show the existence of the stages and how children build knowledge through creating schemas. Research results often support his ideas (see the 'three mountains' task). However, other studies have found that children can do things earlier than Piaget thought, which challenges his ideas.

One weakness of Piaget's theory is that he did not look at the influence of social interactions or the cultural setting, which can affect the development of patterns of thought. Pierre Dasen (1994) found that Aboriginal children developed the ability to conserve at a later stage than Piaget's Swiss sample did. This suggests that culture may affect cognitive development.

When looking at the strengths and weaknesses of a theory, it is useful to consider the methods used to gather evidence for the theory. A weakness is that Piaget's data came from his interviews and observations with children. As a result, his interpretations of situations and events may have been **subjective**, leading to some bias in his findings. Another weakness is a lack of **validity** in his studies; other studies using similar methods but in more realistic settings produced different findings.

Link it up

The way we see our world is discussed more in Topic 8 *Perception*. For more information on validity and subjectivity, see Topic 11 *Research methods*.

Link it up

You need to know about Piaget and Inhelder's (1956) 'three mountains' task. This is described in more detail later in this topic.

Key terms

Subjective: based on personal opinion or feelings.

Validity: when the results of a study represent the situation they are testing (in real life).

Development – How did you develop?

Dweck's mindset theory and the effects of learning on development

What you will learn

- The meaning of mindset.
- How mindset affects the development of abilities and whether they are seen as fixed or changeable through effort.
- The strengths and weaknesses of Dweck's mindset theory.

Key terms

Mindset: a set of beliefs someone has that guides how someone responds to or interprets a situation.

Ability: what someone can do, such as maths ability or ability to play tennis. Dweck suggests ability can be seen as either fixed and innate or as able to be improved.

Effort: when you try to do better using determination.

Fixed mindset: believing your abilities are fixed and unchangeable.

Growth mindset: believing practice and effort can improve your abilities.

Introduction to mindset theory

Mindset is the set of beliefs we all have about our **ability** to succeed in education and other areas. Understanding mindset theory is important because children's educational achievements can influence their future, and their mindset can be improved to affect achievement in a positive way. Mindset theory suggests that children who think they can improve will continue to put in **effort**, whereas those who think they do not have a particular ability tend to stop trying. Mindset theory tells us that children with a **fixed mindset** can change to a **growth mindset** (Figure 1.2).

Fixed and growth mindset: ability and effort

Carol Dweck is an American psychologist who has focused on helping students to achieve more, specifically by considering how praise affects children's

development. A child can be praised for being good at something. According to Dweck, they may then draw the conclusion that ability is fixed at birth. If a child is not praised for something, the child may assume they do *not* have that ability and conclude that it is pointless working hard to achieve it. It is better to praise children for effort, as they then believe they can achieve something and so they carry on trying. Children need to avoid thinking they have or do not have an ability and instead believe they can put in the effort to achieve. This is a more positive way of looking at things.

Key points of Dweck's mindset theory

- Children can develop a fixed mindset about a particular ability they think they do not have and give up, fearing they will not be successful because the ability is not 'in them'. They stop taking on challenges. With a fixed mindset, a person can become depressed and stop trying. A growth mindset allows for the idea of effort bringing success. Challenges become worthwhile and feedback is taken notice of.
- Teachers also have fixed or growth mindsets, which affect how they respond to a child. A teacher with a fixed mindset can see children as lacking a particular ability, whereas a teacher with a growth mindset sees that a child can improve with perseverance.

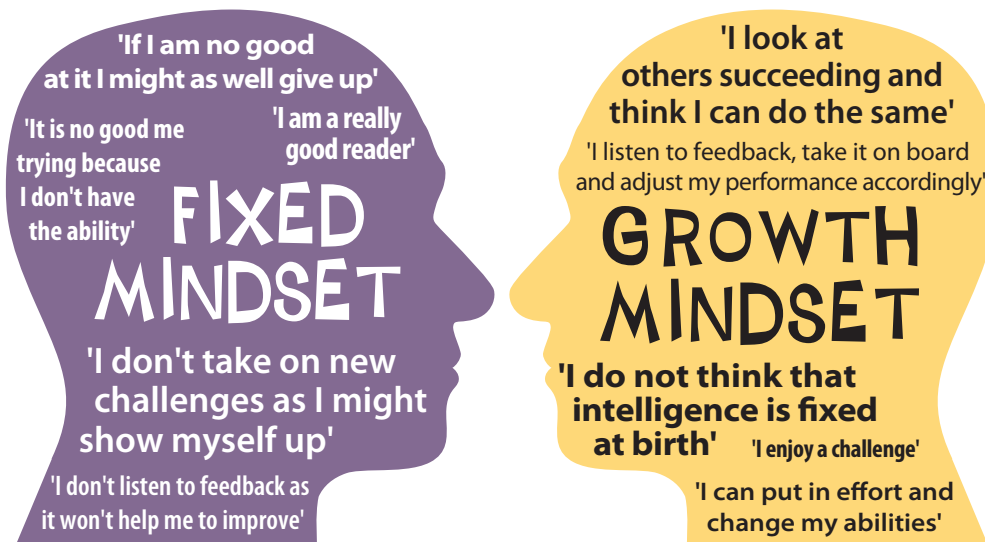


Figure 1.2 Dweck's fixed and growth mindsets and how they affect a person

Exam-style question

For each child, state whether they have a **fixed** or a **growth** mindset.

- Tom does not do well at school because he does not try anything new.
- Kani now reads better having asked her mother to help her to practise.
- Fi felt she was not good at Maths because that is what she was told.

(2 marks)

Exam tip

It is a good idea in an exam to read a question through once and then read it again more carefully from the start to check your understanding before answering.

Experimental evidence

In one of Dweck's experiments (Mueller and Dweck, 1998), it was found that praising students' ability led them to a fixed mindset and they were vulnerable to issues such as coping with setbacks. In contrast, praising effort or use of strategy taught a growth mindset, leading to students persevering more. In another study by Yeager and Dweck (2012) of more than 1500 students, it was found that low-achieving students who learned to use a growth mindset did better compared to a control group who did not have that learning.

Link it up

Ideas from Dweck's mindset theory are used in Gunderson et al.'s (2013) 'Parent Praise' study discussed in the Studies section. Read ahead to find out more.

Strengths and weaknesses of mindset theory

A strength of Dweck's theory is that it has practical applications. Teachers or parents can focus on praising effort, rather than ability, in order to encourage children. The theory itself is positive – it shows that change is possible, which helps society. Furthermore, there is evidence to support mindset theory. For example, Yeager and Dweck's (2012) study found that adolescents could deal better with not fitting in if they had a growth mindset. Believing (or being taught) that people can change led to better school performance.

Many of the studies that look into mindset have been experiments and so have artificial settings. This is a weakness because the results may not represent real life. This means that the data may lack validity. One exception is Gunderson et al. (2013), who used a natural environment when gathering their data on parent praise, giving the findings validity.

There are several other weaknesses. Studying the mindset of a child may result in the child becoming the focus if there are problems with their progress, rather than the quality of what is being taught and how teaching is done. This can affect the usefulness of the theory. Similarly, studies testing mindset theory tend to ignore the effects of giving feedback without any judgement about the child or their ability, such as telling a child to 'add a conclusion' to an essay. The way many studies are done leads to the 'type of praise' being seen as an important variable, but there is a need to consider behaviour where praise does not feature.

Link it up

For more information on the experimental method, see Topic 11 *Research methods*.

Apply it

When marking Sanjit's and Sue's essays, the teacher writes comments as well as giving marks. Her comments to Sanjit, whose mark is low, include 'You do not write well'. Comments to Sue, whose mark is high, include 'You are very good at writing essays'. Using Dweck's theory, explain the possible mindset of the teacher. State **one** comment for Sanjit and **one** comment for Sue to illustrate the opposite mindset.

Willingham's learning theory and the effects of learning on development

What you will learn

- Factual knowledge has to come first before skills can be developed.
- Learning relies on practice and effort.
- Strategies to support cognitive, physical and social development.
- The strengths and weaknesses of Willingham's learning theory.

Link it up

Criticisms of Piaget's theory of cognitive development and his 'three mountains' task are discussed in the Studies section.

Develop it

Willingham writes a column called 'Ask the Cognitive Scientist' in which he answers questions about how to improve children's learning (Figure 1.3). Research some of Willingham's advice to teachers.

Introduction to Willingham's learning theory

Daniel Willingham is a cognitive scientist who studies thinking and brain activity. His work can be applied to the classroom and to other situations. In his work, he explains not only his own ideas but also problems with the ideas of others, including Piaget and his 'three mountains' task.

Can teachers increase a student's self-control?

Does practice make perfect?

What will improve a student's memory?

Figure 1.3 Some questions Willingham considers about the effects of learning on development in his 'Ask the Cognitive Scientist' column

Factual knowledge precedes (comes before) skill

Knowing facts helps when building the skills of problem-solving and reasoning. An issue with learning and developing skills is that previous knowledge is often needed. For example, if a child reads 'she has more likes than me', they would need previous knowledge about the idea of 'likes' to understand what was being said.

Knowledge can also free up space in our **working memory** to allow us to use mental skills such as problem solving. Working memory involves different processes, working on information that comes in through our senses. Visual information is stored and processed separately from sound information. A part of working memory is used for making decisions about the information and working memory is limited.

Willingham suggests that what someone already knows leaves them more processing power to solve a problem and aids understanding. For example, factual knowledge that priests wear special clothing can help someone to understand a problem about how a priest might trip on their robes.

Key term

Working memory: has different parts for processing information coming in from our senses, including visual and sound data, and also involves a decision-making part.

The importance of practice and effort

Willingham emphasises that practice and effort enable us to master knowledge and skills. It is important to practise enough to be able to do things automatically. This is necessary in order to leave enough working memory for learning new things. Practice is not the only thing that's important – a skill must be repeated many times and kept up.

Importance for building knowledge

Short-term memory involves practice, which means **rehearsing** what is to be remembered. What is learned then goes into the **long-term memory** where material has to be reviewed and practised in order to remember it. There comes a time when there has been enough practice and effort. The material is fixed in the long-term memory so well, that it is much less likely to be forgotten than if it was not practised and focused on (Figure 1.4). Ways of practising to build knowledge include doing quizzes or different tasks to help you learn the material.

Don't practise until you get it right. Practise until you can't get it wrong.

Figure 1.4 Willingham wants students to practise enough for a skill to become automatic

Link it up

Short-term and long-term memory, including the role of rehearsal, are discussed in Topic 2 *Memory*.

Develop it

Try the 'Stroop Effect test' online to see how automatic processing works.

Key terms

Short-term memory: our initial memory store that is temporary and limited.

Rehearse: repeat information over and over to make it stick.

Long-term memory: a memory store that holds potentially limitless amounts of information for up to a lifetime.

Motor skills: actions that involve muscles and brain processes, resulting in movement.

Importance for building skills

Problem-solving and creative thinking are skills a student needs to learn and these skills use working memory. Skills need to be developed so that they become automatic and use little space in working memory. For example, reading becomes automatic once there has been enough practice and effort.

Strategies to support development

Cognitive development

Willingham proposed teaching strategies to help students learn. He suggested that teachers should:

- use problems that are new and within a student's ability but that also require some effort
- understand a student's likely stage of development when planning activities
- remember that a student's abilities are variable and can change from day to day
- consider factors other than developmental level. For example, the student might not understand the task.

Physical development

Willingham also believed that practice and effort would improve physical development, such as muscle movements (**motor skills**). He related muscle movements to brain processing, suggesting that in order to improve these skills, you should:

- focus on what movements will be suitable and in what order they need to be carried out
- practise the movements in that order enough times to make the muscle commands automatic (to build a skill set)
- use conscious effort. For example, make changes in order to develop the motor skill, such as raising the bar when developing jumping skills.

Development – How did you develop?

Social development

Willingham's focus on practice, effort and development gave rise to ideas that teachers can use to help improve social development.

- Build on a child's ability to take the view of someone else. Willingham disagrees with Piaget's view that children cannot see things from someone else's viewpoint until they are about 7 years old; he thinks this can occur nearer to 18 months. In practice, Piaget himself later changed his view of egocentrism and **decentration** and agreed that during the first 18 months, children can see other viewpoints. Once able to take another's viewpoint, a child can behave in helpful ways. This is the start of forming social relationships with others.
- Demonstrate appropriate social behaviour. The child will use **social learning**, where children imitate the behaviour of others in certain circumstances.
- Help a child to stop impulsive behaviour, which means behaving without considering the consequences and mainly without thought. In educational terms, this uses up energy that could be used more productively, such as by paying attention to what is required in a classroom. By stopping impulsive behaviour, a child can develop more suitable responses in social situations, which can help with building friendships. Impulsive behaviour can be controlled by using an organised classroom environment and removing anything that can trigger such behaviours.
- Encourage practice, which requires **self-regulation**. Children need self-regulation because there are often other things they would rather do. Willingham refers to both **nature** and **nurture** in this respect. Self-regulation can come from genes. It can also be influenced by the environment, such as parents giving a child emotional support.
- Delay giving a reward for a task to encourage a child to keep working at it, which requires them to have self-control.

Link it up

The nature and nurture debate is discussed in Topic 3 *Psychological problems*.

Strengths and weaknesses of Willingham's learning theory

Willingham's work can be applied to education and other situations to promote a child's development in a positive way. These practical applications of the theory are one of its strengths.

Key terms

Decentration: being able to separate yourself from the world and take different views of a situation, so not being egocentric.

Social learning: learning by observing and copying others.

Self-regulation: limiting and controlling yourself without influence from others.

Nature: explanations of behaviour that focus on environmental factors (the things that happen to us).

Nurture: explanations of behaviour that focus on environmental factors (the things that happen to us).

Develop it

Piaget in the 1920s changed his view of egocentrism. He said that decentration, which means being able to separate self from the world and so 'see' other viewpoints, occurs as early as the first 18 months (Kesselring and Müller, 2011). A young child, by gathering information and changing their ideas to suit what they experience, comes to see themselves as separate from the world. In the 1950s, Piaget suggested that decentration occurs in each of the stages, and that egocentrism, which means not being able to separate one's own perspective from that of others, features in different ways in all of the stages.

There are other studies that support Willingham's work and his arguments against Piaget's view that development is in stages. For example, Betty Repacholi and Alison Gopnik's (1997) study provides experimental support, showing that young children were not as egocentric as Piaget thought. Experiments control everything that might affect a study's results, allowing researchers to make deliberate changes to see the effect these have on something. Experimental evidence is therefore a strength because experiments are carried out in a controlled way; however, they might not reflect reality, so the results may lack validity.

Link it up

Repacholi and Gopnik's (1997) study is used as part of the discussion on Piaget and Inhelder's (1956) 'three mountains' task in the Studies section. Read ahead to find out more.

One weakness is that Willingham did not really emphasise the importance of individual differences for learning, though some features of his theory relate to genes. For example, he suggested that self-regulation and impulsivity are, to some extent, inherited. Though the theory gives strategies to help development, such as children getting emotional and cognitive support from their parents, what is in someone's genes cannot be changed easily using strategies. His theory aims to give universal strategies for change even though he acknowledges genetic contributions.

Willingham's ideas come from many areas of cognitive science, including neuroscience (the role of the brain in muscle movements), memory theory (the role of working memory), and cognitive development. Drawing on evidence from other theories can be a strength. However, it does mean his ideas are not really one singular theory that can be tested by gathering data. This may be considered a weakness.

Link it up

The idea of self-regulation as an inherited type of temperament is discussed in Topic 7 *The self*.

Studies

Piaget and Inhelder (1956) 'Three mountains' task

What you will learn

- Background to the study.
- The main aims, procedure, results and conclusion.
- The strengths and weaknesses of the study.

Background to the study

According to Piaget's cognitive development theory, a young child in the pre-operational stage sees the world from their own viewpoint and cannot see someone else's view of the world. Piaget called this inability 'egocentrism' – children are focused on themselves. They are likely to change how things look in their own minds so that the 'world' matches how they see it.

The understanding that there are viewpoints other than their own is something that develops over time. This helps to take children into the concrete operational stage, where they can 'decentre' – they can see from a viewpoint other than their own and can consider multiple views of a situation.

Link it up

Look back at Piaget's stages of development, including the issue of egocentrism and the ability to decentre.

Apply it

Ria, a 5-year-old, argues with her 8-year-old brother because he will not play her game, which requires him to describe what is on the table for tea. She can see the table but he cannot. Using Piaget's ideas, explain why her brother might not play the game and why Ria is annoyed about this.



What would be the problem for the child who cannot understand what the other child can see?

The 'three mountains' task is part of a series of experiments that Jean Piaget and Bärbel Inhelder carried out to study children's ways of looking at the world. Piaget and Inhelder wanted to look at a children's understanding of groups of objects. They set up a study using a model of a group of mountains where children on different sides would have different views of each mountain.

Aims

Piaget and Inhelder wanted to look at:

- the extent to which children of different ages were able to take the view of another person
- children's overall system of putting together a number of different views of what they see.

Procedure

In total, 100 children were studied (Table 1.2). Children under 4 years old were not involved in the study as they were considered too young for the task.

Age	4–6.5 years	6.5–8 years	8–9.5 years	9.5–12 years
Number of children	21	30	33	16

Table 1.2 Details of Piaget and Inhelder's participants

Four main pieces of equipment

The study involved building a model of three mountains using sheets of paper pasted together to form card. The model was one metre square and ranged from 12 to 30 centimetres high. The lowest mountain was green and had a house on top, the next highest was brown and had a red cross on top and the highest, which was grey, had a snow-covered top. The smaller green mountain had a path winding down it while the middle-sized brown mountain had a stream coming down it. These were the important features of the model.

Ten pictures of the three mountains model were taken from different positions around it. The pictures were taken so that the features were visible and the colours were clear.

There were three pieces of card the same colour as the mountains, which the child could arrange to represent the mountains according to a certain viewpoint.

There was a wooden doll, around three centimetres high, with no facial features.

Ways of questioning the child

- The child was asked to use the cardboard shapes to show how the mountain scene looked from different viewpoints. They were asked to place the shapes to show the view they themselves were looking at. They were also asked to place the shapes to show what the doll, positioned by the researcher around the model, could 'see' (Figure 1.5).
- The child was shown ten pictures of the model and asked to pick out the picture that represented what they could see from different positions. They were also asked to choose the picture the doll could 'see', again from different positions the doll was placed in.
- The child chose a picture and then had to position the doll so it could 'see' that viewpoint.

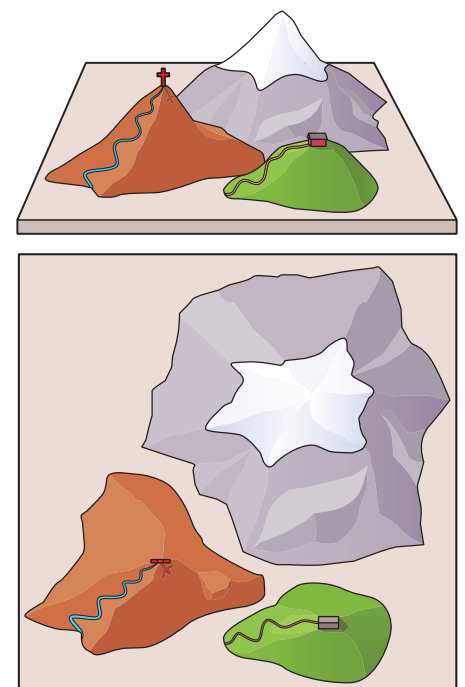


Figure 1.5 The three mountains model had specific features the child could use to describe it, such as a mountain blocking the view of another mountain

Development – How did you develop?

Results

Pre-operational stage

A child aged from 4 to 6.5 years in the pre-operational stage chooses pictures and places cardboard to show their own view of the three mountains model, even if asked to show the doll's view. Children cannot place the doll in a position where the view matches a picture the child is shown. Even though the older children in this stage start to see that there are views other than their own, overall they show egocentrism.

Concrete operational stage

From 7 to 9 years old the child starts to understand that others looking from a different position can see the model differently. By 9 to 10 years old, children can understand that the doll has a different view if in a position that is different from their own.

As part of the experiment, Piaget and Inhelder gathered **qualitative data** and included observations about individual children in their report.

Key term

Qualitative data: data that is descriptive, not numbers, such as words or pictures.

Link it up

Qualitative data is discussed in Topic 11 *Research methods*.

Conclusion

Piaget and Inhelder concluded that children up to about 7 years old were egocentric – they could not 'see' from a viewpoint other than their own. Towards the end of the pre-operational stage, the children were more able to think about someone else's viewpoint. Therefore, children in the pre-operational stage did not have the understanding of 'viewpoint' yet.

Older children were non-egocentric. They were able to look at the mountains as objects relating to one another, such as the larger one sometimes blocking the view of the smaller one. Older children were able to position their own viewpoint among views of others and construct mental representations of what others can see. They had the ability to co-ordinate different perspectives. Younger children could not do so.

The 'three mountains' task provided evidence for Piaget's stages of development. It showed that children in the pre-operational stage were egocentric whereas those in the concrete operational stage could take a different view from their own and co-ordinate different viewpoints.

Strengths and weaknesses of the study

Piaget and Inhelder's (1956) study had several strengths. They provided a great deal of detail about what was done and, importantly, the results. They wrote about individual children, giving qualitative data that was rich in detail and had depth. In addition to counting the number of errors, they looked in detail at the errors and what each child did and said. This meant they could show, for example, that as a child neared the next stage of development, they could achieve elements of that next stage.

In addition to observation and gathering qualitative data, Piaget and Inhelder used experimental methods – a further strength of the study. The experimental nature of the study meant careful controls were in place, such as using the same model and questions for each child. This allowed comparisons to be made between the results from different children, thus adding strength to the findings. Repeating the study with many children, moving the doll and using different ways of getting the child to show what they saw or what they thought the doll saw, meant there was **reliability** in the findings.

The results suggest that children develop thinking ability progressively as they age, rather than in distinct stages. In the study, older children in one 'stage' were beginning to show the ability of those in the next 'stage'. Piaget acknowledged that there was a period of transition between stages when performance of a task tended to be inconsistent. However, evidence showing that stages are not as decisively 'different' as the term 'stage' suggests there is a weakness in his use of 'stage' to explain cognitive development.

A well-known criticism, and therefore a weakness of the 'three mountains' task, is that other studies, using perhaps more realistic scenarios, did not give the same findings.

- Helen Borke (1975) changed Piaget and Inhelder's task to make it more appropriate for the younger children. Borke used the puppet character Grover from *Sesame Street* and let the children turn the model of mountains that she used, by putting it on a turntable. She found that 3 year olds could give Grover's viewpoint correctly more than 79 per cent of the time and 4 year olds did this 93 per cent of the time. Borke suggested that the 'three mountains' task was too hard for the younger children; it was not that they were egocentric.
- Willingham, whose learning theory is explained earlier in this topic, used Betty Repacholi and Alison Gopnik's (1997) study to criticise Piaget's stages of development. Repacholi and Gopnik, in a study similar to that of the 'three mountains' task, found that children of 18 months could show non-egocentric behaviour. In their study, children tasted crackers, which they liked, and broccoli, which they did not like. Then they saw the experimenter show dislike of the cracker taste and liking of the broccoli. Later, the experimenter placed a bowl of crackers and one of broccoli on the table and asked the child to pass one of the bowls to the experimenter. The 14-month-old children passed the experimenter the food they themselves liked, indicating egocentrism. Children aged 18 months, however, passed the experimenter the broccoli because that is what they believed the experimenter liked. They could appreciate the experimenter's 'view'.

It is generally thought that the situation in Piaget and Inhelder's study, using three mountains, was not sufficiently understood by the children. However, the children were from Switzerland, so would have been familiar with mountainous scenery so this may not have been the case.

Key term

Reliability: the consistency of an outcome or result of an investigation (a measure).

Develop it

Understanding children's mental abilities is important for the criminal justice system. The 'age of reason' is when a child is seen as able to accept responsibility for their actions and 7 is usually the age at which someone is said to be able to commit a crime. Use the internet to find the age of criminal responsibility in different countries such as England, Scotland and Sweden. Search for examples of children under 10 who were not prosecuted for a crime they were thought to have committed. Alternatively, find out about any 10 year olds who were considered old enough to be prosecuted. An example is a case in Norway in 1994 when two young children killed another child.

Sum it up

It is generally thought now that Piaget's tasks were not realistic enough for the children to understand what was being asked. They were not able to understand the doll's viewpoint, for example, because they did not understand how one mountain could block the view of another. Other studies have found that more familiar tasks enable children to decentre at an earlier age; Piaget's 'stage' theory has been criticised as a result of this. Nevertheless Piaget's ideas are still used in education today and help us to understand children's cognitive development.

Gunderson et al. (2013) Parent Praise to 1–3 Year Olds Predicts Children’s Motivational Frameworks 5 Years Later

What you will learn

- Background to the study.
- Aims, procedure, results and conclusion.
- Strengths and weaknesses.

Key terms

Framework: a basic understanding of ideas and facts that is used when making decisions.

Person praise: someone praises the individual rather than what they are doing.

Process praise: someone praises what is being done, not the individual.

Entity theory/motivational framework: a belief that behaviour or ability results from a person’s nature.

Incremental theory/motivational framework: a belief that effort drives behaviour and ability, which can change.

Ecological validity: the extent to which the findings still explain the behaviour in real life situations.

Link it up

Remind yourself about Dweck’s mindset theory, covered earlier in this topic. Ecological validity is discussed in Topic 11 *Research methods*.

Background to the study

Research has shown that the way parents praise their young children impacts a child’s later ideas about reasons for behaviour and beliefs. For example, it is found that praising children’s effort rather than their ability leads to the idea (**framework**) that working hard can change achievements. Many studies have used experiments to show this. Elizabeth Gunderson et al.’s (2013) study set out to see whether looking at parents praising children in the home – a natural setting – would support these experimental findings.

Person and process praise

Parents can praise a child personally (**person praise**), they can praise a child’s behaviour (**process praise**) or they can use a different type of praise.

- Person praise seems to lead children, though not through conscious processes, to the idea that they are born with or without an ability. This in turn leads to fixed theory, known as **entity theory** or **entity motivational framework**. The result is that children might not try as hard on a task they think they are not good at.
- Process praise, which involves praising behaviour and effort, appears to lead children to see a link between effort and success. They are likely to see (again not consciously) ability as changeable and are more likely to keep trying to do better. This change theory is known as **incremental theory** or **incremental motivational framework**.

Building on experimental evidence

These ideas draw on Dweck’s mindset theory (Carol Dweck was involved in this study). Mindset theory uses experimental evidence. One issue with this is that experiments, by using an artificial environment, can measure unnatural behaviour and give unnatural findings (they lack **ecological validity**). Consequently, Gunderson et al. wanted to use a natural setting when gathering their data.

Praise and gender

Previous studies have shown that boys tend to think of ability and behaviour as changeable (incremental theory), suggesting that they receive process praise. Praise for girls is more likely to lead to entity theory, meaning behaviour and ability are seen as fixed, suggesting that girls receive more person praise. Gender differences regarding praise and reasoning are therefore of interest to psychologists.

Aims

The researchers wanted to know whether:

- children are affected by different types of parental praise given in a natural situation
- parents give girls less process praise and more person praise than boys
- parents’ use of process or person praise in early childhood predicts a child’s reasoning five years later about what motivates and causes behaviour (whether it is down to ability or effort).

Method

The study followed a group of children over a long period of time. They looked at parents’ use of praise at home when their children were 14 months, 26 months and 38 months old. Five years later, the children’s ideas about behaviour were measured and related to the type of praise they had received. Researchers looked at a child’s gender and influences of the type of praise on later ideas.

Participants

In total, 29 boys and 24 girls, with their caregivers, took part in the study. Of these children, 64 per cent were white, 17 per cent were African-American, 11 per cent were Hispanic and 8 per cent were from multiracial backgrounds.



How might the type of praise affect a child’s understanding of their ability?

Maths tip

Practise drawing up tables, and using and calculating percentages when you see them in the text. Figures are usually given to two decimal places, so do the same and show all your working out. Here is an example for these participants:

Percentage of participants (by gender)		Percentage of participants (by ethnicity)			
Boys	Girls	White	African-American	Hispanic	Multiracial
$29 \div 53 \times 100$	$24 \div 53 \times 100$	64%	17%	11%	8%
54.72%	45.28%	Note these percentages should add up to 100%.			

Table 1.3 Example of how to calculate and show percentages in a table

Procedure

Parental praise patterns

Neither those collecting the data nor the participants knew that praise was being studied. The participants thought the study was about language development.

Development – How did you develop?

At each visit, participants were asked to 'go about a typical day' in the home. The caregiver–child interactions were videotaped in 90-minute sessions.

Children's later beliefs

At 7–8 years old, the same children answered two questionnaires about what they thought led to a person's intelligence and what led people to act morally (or not). Questions included 18 items covering children's ideas – their motivational frameworks – about what underpins intelligence and six items about their beliefs about what underpins 'good' and 'bad' actions (socio-moral views).

Link it up

Observations, questionnaires and quantitative data are discussed in Topic 11 *Research methods*.

Results

Parental praise patterns

- On average, 3 per cent of all parental comments to the child were praise.
- Process praise was 18 per cent of all praise and person praise was 16 per cent, showing similar proportions.

Praise type	Mean percentage of all parental utterances	Mean percentage of parental praise utterances
Process	0.59	18
Person	0.45	16
Other	1.97	66
Total	3.01	100

Table 1.4 Frequencies of each type of praise (using figures from observations at 14, 26 and 38 months combined)

Gender and parent praise

There were gender differences in process praise: 24.4 per cent of praise for boys was process praise compared with 10.3 per cent for girls.

Parental praise and children's frameworks

The more process praise there is in early childhood, the more likely children (when older) will believe that putting in effort is worthwhile. There is a relationship between parents praising what a child does (process praise) and the child's framework when older (believing that effort

is worthwhile), which was as predicted (the correlation was 0.35). To test the results, researchers looked for a relationship between older children who believed effort was worthwhile (an incremental framework), as they were receiving process praise both when they were answering questions about intelligence and when answering questions about moral thinking.

By looking at two different measures of motivational framework and finding a relationship with parents giving process praise in both, the conclusion that giving a person praise leads to a more incremental framework (meaning children are likely to see that effort pays off) was strengthened. The correlations found using these two measures were 0.26 and 0.29, which shows how similar they were. When researchers looked at the three different ages to correlate separately with the later motivational framework, they found correlations of 0.27, 0.21 and 0.32, again suggesting that the conclusion was robust. There was no relationship between parents giving person praise and children later showing an entity motivational framework (this time, the correlation was -0.05). Early person praise did not give fixed frameworks later in life.

Conclusions

A clear relationship was found between parents' use of process praise and a child's later use of an incremental motivational framework (ability being changeable). However, the study's aims were only partly supported because the study did not find that parental use of *person* praise led to an *entity* motivational framework (ability is fixed). The researchers found that boys received more process praise than girls (boys were praised more for effort and strategy) so there are gender differences in the way each gender is praised. Also, boys tended to have more of an incremental framework than girls, which fits with the findings of other studies that girls tend to attribute failure to ability more than boys do.

Exam-style question

Explain the differences shown between the three types of praise in Table 1.4.

(3 marks)

Exam tip

When asked to use data, be sure to include actual figures as well as words in your explanation.

Strengths and weaknesses of the study

Gunderson et al.’s (2013) study shows that Dweck’s findings in experimental studies, where the setting is artificial, are also found in a naturalistic environment. Gunderson et al. represented the natural environment by recording types of praise in the child’s home while they went about their typical day. Findings from the two different methods – experiment and observation – support one another and the theory itself. Such findings are a strength of both the theory and the study.

Another strength is that the researchers who videotaped and transcribed the data did not know that parental praise was the point of interest. This helped to avoid bias in the gathering of the qualitative data. If someone knows why they are being watched, and if the person watching also knows what outcome is expected, that knowledge can affect the data gathered.

The **ethics** of the study could be criticised, and this is a weakness. The participants were deceived. They were told the study was about child development, but in truth it was about types of praise and the effect this has on a child. For ethical reasons, there must be as little deceit as possible in a study. If there was a **debrief** this may be seen as ethically acceptable.

Another weakness is that the parents may have changed their style of praise because they were being observed, even though they did not know what aspect of their behaviour was being observed. The data, therefore, might not be natural, and so may lack validity.

For this study, only 53 parent/child pairs in Chicago were used. This sample may not be representative of a wider population, which limits the **generalisability** of the findings. This is a further weakness of the study.

Key terms

Ethics: moral principles about how someone should behave in a society.

Debrief: after an investigation, participants are given full disclosure of the study.

Generalisability: the extent to which the results of a study represent the whole population, not just the sample used.

Link it up

Ethics, validity and generalisability are discussed in Topic 11 *Research methods*.

Sum it up

This study has clear applications regarding children’s development. Parents and teachers can work on praising effort and process rather than praising ability of a child. Although this finding came from Dweck’s other studies, a strength of Gunderson et al.’s study is that the data came from real-life interactions between parents and children using video material to increase validity by avoiding too much interpretation.

Psychology in action

This study has implications for parents when they interact with their children.

- A parent saying ‘you are good at reading’ is encouraging the child. However, this type of praise means if a child is not praised for something, they might think they are not good at it and will stop trying to do well.
- A parent who says ‘that was good reading’ is praising what the child is doing, which suggests *actions* can be good or bad. It is not the *child* that is ‘good at something’ or ‘bad at something’. If a child believes *actions* can be good or bad, rather than their abilities, they might feel encouraged to try harder and to listen when strategies for success are being suggested.



Why do children who are praised for effort, rather than ability, keep trying?

Issues and debates

The development of morality

What you will learn

- The meaning of the terms 'morals' and 'morality'.
- The meaning of pre-conventional, conventional and post-conventional stages of morality.
- Theories used to explain the development of morality in humans.

Key terms

Morals: standards of right and wrong behaviour that can differ between cultures and can depend on the situation.

Moral development: children's growing understanding about right and wrong.

Heteronomous: rules put into place by others.

Autonomous: rules can be decided by the individual person.

Morals and morality

Morals refer to what is right and wrong in human behaviour. Something that is moral is what most people agree is right and good. However, what is considered to be moral can differ between cultures.

Morality refers to 'proper' behaviour. People should behave according to principles of what is right and wrong. Morality means separating good behaviour from bad behaviour.

Moral development refers to how children reason about what is right and wrong, and how they make moral decisions. There is an important focus on how their understanding of moral behaviour changes over time and into adulthood.

Development of morality

Earlier we saw how children develop their thinking/cognitive ability, including Piaget's ideas about how children have four stages of development. Stages also feature in Piaget's (1932) theory of moral development. Another theorist, Kohlberg, had a different view of moral development, also using stages.

Piaget's (1932) theory of moral development

Piaget suggests that moral understanding develops, as with cognitive development, through stages.

- From about age 5 to 10 years, a child believes rules cannot be changed. Their ideas of morality come from others around them, such as parents and teachers. At this age, they tend to focus on an action's consequences. For example, breaking the rules leads to punishment, so they obey the rules. This stage is '**heteronomous**' (directed by others).
- From about 10 years old, a child knows that the intentions of the action are important. An action with bad consequences can be a good action if the intention was good. A child understands that it can be right to change rules to benefit others and if everyone agrees. Morals are seen as agreed between people and the child knows that following rules is about more than the consequences of not following them. This stage is '**autonomous**' (the individual decides).

Develop it

Piaget used a story to test a child's moral development: 'John accidentally broke 15 cups. Henry purposely broke one cup. Who is naughtier, John or Henry?' Find out more about how Piaget used this story in his work.

Kohlberg's (1958) theory of moral development

Lawrence Kohlberg, like Piaget, used stories to find someone's stage of moral development.

Kohlberg suggests that there are three levels of moral reasoning, each with two stages as shown in Table 1.5.

Level and ages	Stages and explanations
Level 1: pre-conventional morality (aged up to about 9 years old)	Stages 1 and 2: the child believes rules cannot be changed. It is the consequence of the action – whether there is punishment or reward – that makes it a good or bad action. Stage 1 focuses on the child obeying in order to avoid punishment. Stage 2 is about self-interest and 'what's in it for me', including what benefit can be gained from moral actions. These two stages are found in children and are a basic view of right and wrong.
Level 2: conventional morality (most young people and adults)	Stages 3 and 4: the young person or adult sees themselves as a good member of society and that is their starting point for what is moral behaviour. Reasoning comes from group norms . Stage 3 is about being seen as 'good' and conforming to social rules - wanting to be liked. Stage 4 is about maintaining social order by obeying authority, which is a duty.
Level 3: post-conventional morality (only about 10% of people reach this level)	Stages 5 and 6: the individual has their own ideas about what is good and bad. They understand that there are moral principles that are universal (for everyone) rather than being for one society. Stage 5 is about laws being social contracts which individuals enter into, so there can be differences in morality between individuals according to which laws they have agreed to. Democracy is an example of Stage 5 reasoning. Stage 6 is the understanding that moral reasoning is abstract and there are universal ethical principles that 'must' be followed. This stage emphasises right and wrong actions beyond individual laws. These two stages go beyond social laws to what the individual has as moral principles.

Table 1.5 Kohlberg's three levels of moral reasoning

Weaknesses of these theories

- Both Piaget and Kohlberg used stories that were artificial and might not represent real thinking (they lack ecological validity). There were no real consequences in the stories from the decisions that were made.
- Carol Gilligan (1977) criticised Kohlberg, saying his male-only sample meant his theory was about male morality (Figure 1.6).

Develop it

Use the internet to find out about Kohlberg's story of 'Heinz's dilemma', which was used to help find someone's stage of moral reasoning.

Key term

Norms: society's values and customs, which a person in that society would be governed by.

Development – How did you develop?



Figure 1.6 Males and females have a different focus regarding morality, which might come from learning gendered social rules and norms

Damon (1999) on developing a moral self

William Damon's (1999) theory explains how children develop an idea of their moral self, which links to their development of understanding of morality and morals (Figure 1.7). He discusses how moral development is explained by some as being in our biology, by others as coming from social experiences or developing with a child's intellectual development (as Piaget and Kohlberg explain). **Nativist theories** (theories thinking morality is in our nature) hold that emotions are within us, such as babies being able to feel empathy more or less from birth. Damon gives evidence that such emotions are found in babies universally, which emphasises the 'nature' argument about moral development. 'Nurture' theories show how children are affected by environment and social influences. For example, Diana Baumrind found that the type of parenting affected moral development in children. Damon concludes that moral identity (which is someone's commitment to morals) comes from the many social influences a child experiences. Therefore, children must hear a consistent message about shared standards in order to develop moral understanding.

Key term

Nativist theories: theories that view morality as part of human nature.

Link it up

The nature and nurture debate is discussed in Topic 3 *Psychological problems*.

What can help children to develop a moral understanding?

Children who experience different views and ways of looking at things may develop more, in a moral sense. Such experiences can get them thinking. What would also be useful is to give children and young people the chance to sort out problems with others, again helping them to get experiences of the thinking of others. Children should be given the chance to develop their self-control and accept social responsibility.

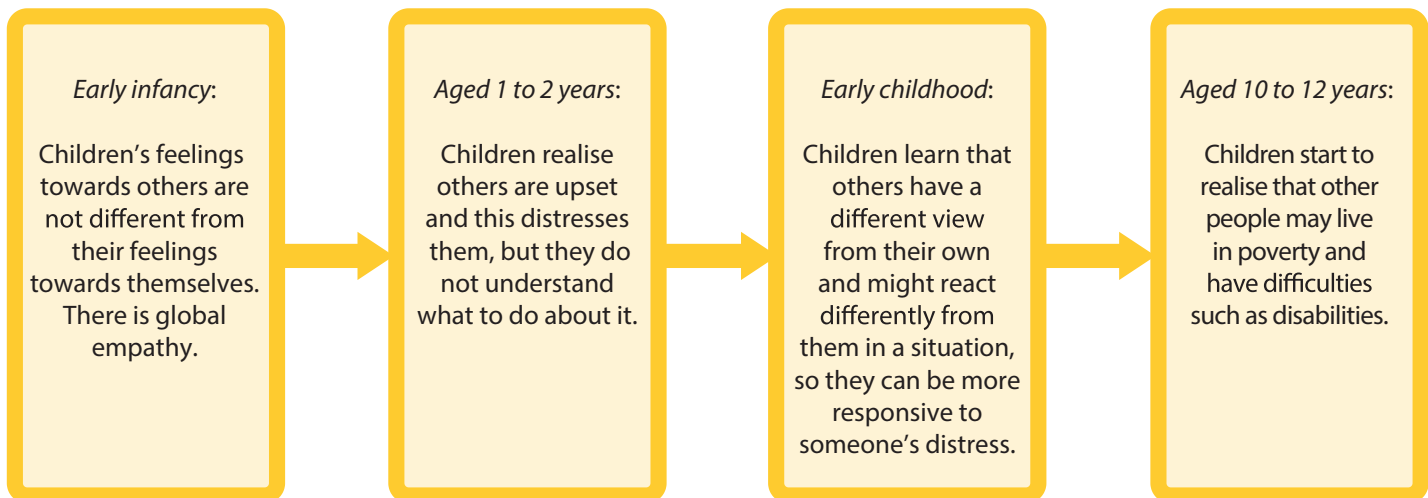


Figure 1.7 Damon's ideas about developing empathy and how this links to a child's level of understanding at different ages

Apply it

Suki, aged 4, played Snap but did not understand that there were rules. Andi, aged 7, played too, insisting that the rules of the game were obeyed fully. Bee, aged 11, realised that, if everyone agreed, the rules of the game of Snap could be changed without negative consequences. Describe the theory of moral development that can explain these children's ideas about the game of Snap. Refer to the children in your answer.

Psychology in action

Understanding development helps parents to know more about what affects their child, such as types of praise. It can also help them know more about what to expect from their child, such as understanding that a child may not be able to see the parent's viewpoint so will not behave as a parent thinks they should. Understanding development also helps teachers to understand that each child develops in stages, but also individually, and their level of understanding should be taken into account when setting them learning tasks. It is helpful to know a child's level of understanding when deciding whether they can be held responsible for their actions. In some cases, a child may have committed a criminal action without fully understanding the consequences of what they were doing. Health care professionals can know more about how to help children with their pain if they understand how the child is likely to perceive their pain. Social workers use the idea of stages of development to make judgements about when children and young people are at risk. For example, they can understand expected development at a certain age and compare a child's abilities and behaviour with that expected development.



Topic 2 | Memory – How does your memory work?

Exploring the topic

Memory is central to being human. Imagine your life without memory: you would not know who you are, where you came from, who your family is, what you were doing at any time in the past and what you planned to do after school.

So memory can be seen as an anchor to the past, allowing us to understand what is currently happening, and to project ourselves into the future. Understanding how memory works can help our own memory improve and can also help us support those whose memory does not work as well as others.

In this topic, you will explore different psychologist's views of how memory works by looking at the way in which we remember and forget things. You will learn about the different memory stores, such as the theory proposed by Atkinson and Shiffrin (1968). You will also learn about how memory can be reconstructive as our recollection of an experience can differ slightly to what actually happened.

Your learning

In this topic you will learn about:

- the structure and processes of memory and information processing
- the features of short-term and long-term memory
- two types of amnesia: retrograde and anterograde
- the active process of memory through Bartlett's (1932) Theory of Reconstructive Memory
- the structure of memory through Atkinson and Shiffrin's (1968) Multi-store Model of Memory
- memory studies by Bartlett (1932) and Peterson and Peterson (1959)
- issues and debates around reductionism and holism.

Getting started

Get started on this topic by finding out a bit about your own memory. Try to think of the names of Snow White's seven dwarfs or the names of Santa's reindeer. Write them down in a list in the order in which you recall them. Write down all the names that pop into your mind even if you know that they might be wrong. Once you have exhausted your memory, find out their real names and compare them to your list. If you have recently heard the names, you will probably find that your recall is quite accurate. You may find that some names on your list are wrong but similar in sound or meaning to the correct names. For example, you may recall Drowsy instead of Sleepy, Shy instead of Bashful, or Dixen instead of Vixen. Errors in recall occur because we cannot retrieve the right information.

Try testing the capacity of your short-term memory by playing a memory game such as Kim's Game. Collect a number of items such as a pencil, mug, mobile phone, paper clip and so on. Place the items on a clear space and set a time limit for reviewing the items, say about 30 seconds. Now turn away from the items and try to remember them all.



The number of items you can recall gives you an idea of how much information you can retain in your short-term memory

Memory – How does your memory work?

Memory and information processing

What you will learn

- How the brain receives and processes information.
- How we go about encoding information in our memory.
- How we store and retrieve information in our memory.

Stages of memory and information processing

Information input

If you imagine the brain is like a computer, it is easier to understand how the brain **processes** information. With a computer, information is **input** via a keyboard, camera or other external device. For humans, information from the environment around us is input via our senses. The five main (or principle) senses are:

- sight
- hearing
- touch
- taste
- smell.

Encoding the information

The brain processes the information we receive from our senses; it pays attention to the important information and makes decisions based on it.

We unconsciously or deliberately **store** some sensory information. This process requires **encoding** the sensory input into an electrochemical memory trace that can be stored in the brain, similar to the coding of a computer.

Once encoded, the memory system can store the memory trace for a few seconds or an entire lifetime. Unlike a computer, we often have no conscious control over how long a memory is stored, but some memories stay with us longer than others. For example, personal experiences that are meaningful to our lives or skills we have learned, such as riding a bike, stay with us for a long time. Sometimes we have to put a lot of effort into remembering information, such as when we revise for an exam. Other memories are just stored for as long as they are useful, such as remembering what we need to buy from a shop that day.

There are three ways of encoding information to be used by our memory system:

- **acoustic encoding** – holding sound information
- **visual encoding** – holding images
- **semantic encoding** – holding the meaning of information.

Output

Just like a computer, the brain produces an **output**. An output for a computer might be the product of a computer program, such as a printout of a document. For humans, an output is a behaviour that is produced. Specifically for memory, the output is the stored information we retrieve (known as **retrieval**).

Key terms

Processing: the operations we perform on sensory information in the brain.

Input: for human memory, this refers to the sensory information we receive from our environment.

Storage: the retention of information in our memory system.

Encoding: turning sensory information into a form that can be used and stored by the brain.

Acoustic encoding: the process of storing sound in our memory system.

Visual encoding: the process of storing something that is seen in our memory system.

Semantic encoding: the process of storing the meaning of information in our memory system, rather than the sound of a word, we store the definition/meaning of that word.

Output: for memory, this refers to the information we recall; in a broader sense, output can refer to behavioural response.

Retrieval: the recall of stored memories.

Exam-style question

Define what is meant by the following terms:

- encoding
- storage.

(4 marks)

Exam tip

When asked to 'define' a concept, you should give a clear and concise answer. It is worth developing a glossary of key terms and flashcards for testing yourself.

Short-term and long-term memory

What you will learn

- The concepts of duration and capacity.
- The features of short-term memory.
- The features of long-term memory.

Duration and capacity

Memory is critical to being human. We can store a large amount and a range of types of information that help us understand and interact with the world around us. It is widely understood that we have two main memory stores: a **short-term memory** store and a **long-term memory** store. These are characterised by key differences in the length of time that information is stored (**duration**) and how much information can be stored (**capacity**).

Short-term memory store

Sensory information (input) first enters the short-term memory store. This is a temporary store that lasts for around 18 seconds and holds about seven items of information. Short-term memory encodes information acoustically through repetition of information. If we **rehearse** this information (say it over and over to ourselves), we can store it in our short-term memory for many minutes and it can then be transferred to the long-term memory store (Figure 2.1).

Long-term memory store

Long-term memory can last for minutes or up to an entire lifetime, and it can hold a potentially unlimited amount of information. Encoding in long-term memory is largely semantic, but can be visual or acoustic.

Why do we forget things?

Information in our short-term memory can be forgotten through a process known as **displacement**. This is when new incoming information pushes out older information as we exceed the limited capacity of short-term memory. Forgetting in long-term memory is thought to be due to a variety of reasons; some memories simply decay as the memory trace is not used, while others may be overwritten by new information (**interference**). Or it may simply be the case that we cannot find the memory because we have lost the link, like a broken URL when we are searching for a web page on the internet.

Key terms

Short-term memory: our initial memory store that is temporary and limited.

Long-term memory: a memory store that holds potentially limitless amounts of information for up to a lifetime.

Duration: the length of time information can be stored in short-term and long-term memory.

Capacity: the amount of information that can be stored in short-term and long-term memory.

Rehearse: when we repeat information over and over again to make it stick.

Displacement: when the short-term memory becomes 'full' and new information pushes out older information.

Interference: when new information overwrites older information, for example when a new phone number takes the place of an old number in your memory.

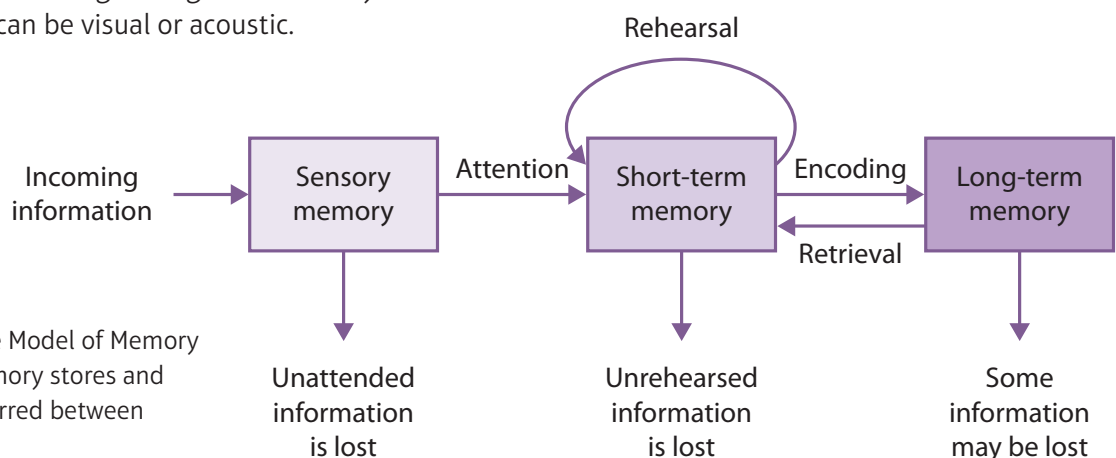
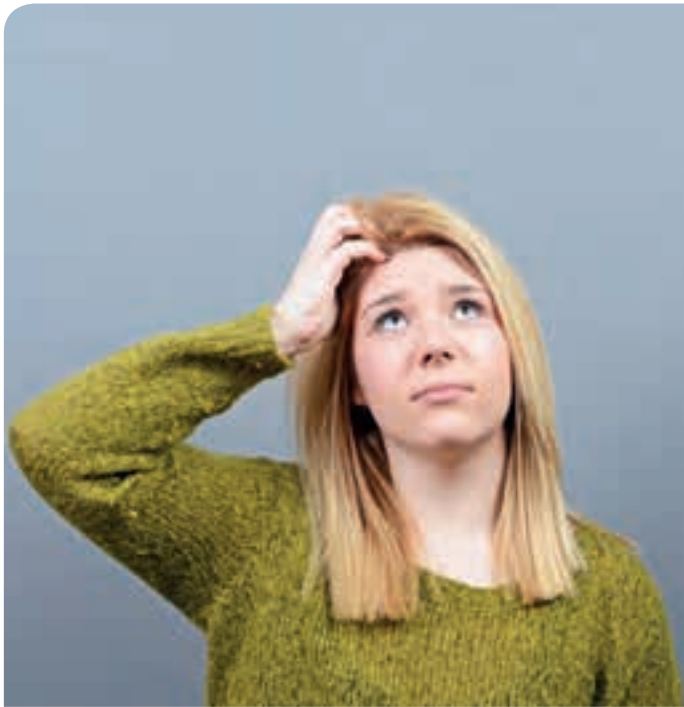


Figure 2.1 The Multi-store Model of Memory shows three separate memory stores and how memories are transferred between each store

Memory – How does your memory work?



Try it

You can test the capacity of your own short-term memory by trying to recall increasingly longer lists of digits.

For each line of digits below, read it once and then cover it up. Now try to recall the digits in the correct order. Repeat for the next line.

692
7341
95832
865712
1745398
52973184
315275948

Compare your recalled lists of digits to the correct list above. Your short-term memory capacity is the number of correctly recalled digits in a line.

Do you ever walk into a room and forget what you were looking for?

	Capacity	Duration	Encoding	Forgetting
Short-term memory	Around seven bits of information	Around 18 seconds without rehearsal	Acoustic	Displacement Decay
Long-term memory	Potentially limitless	A few minutes to a lifetime	Mainly semantic	Decay Interference Retrieval failure

Table 2.1 Summary of the features of short-term and long-term memory

Apply it

Imogen's father gives her a shopping list and asks her to go to the local shop to buy these items:

- bread
- crisps
- milk
- biscuits
- beans
- tomatoes
- cheese
- cucumber
- cereal
- newspaper
- squash
- soup.

Imogen reads the list and rushes to the shop. At the shop, Imogen realises she has forgotten the list but is confident that she can remember it. She continues shopping. When she returns home, she has bought tomatoes, cheese, cucumber, cereal, newspaper, squash and soup.

Using your knowledge of memory, explain why Imogen might have failed to buy all of the items on the shopping list.

Understanding amnesia

What you will learn

- The meaning of the terms 'retrograde amnesia' and 'anterograde amnesia'.
- The symptoms of these two types of amnesia.

Although the capacity of long-term memory is potentially limitless and its duration can be up to a lifetime, we do still forget things. Sometimes people experience a special type of forgetting, called **amnesia**. Amnesia is a condition characterised by forgetting or memory loss, particularly after a brain trauma. There are two types of amnesia that affect long-term memory: anterograde and retrograde.

Anterograde amnesia

Anterograde amnesia is the inability to store any new long-term memories following a brain injury. A patient with anterograde amnesia has an intact short-term memory, so can process sensory information in that moment of time. But they are unable to lay down any new memories that last beyond a few minutes. It seems their ability to transfer information from short-term to long-term memory is damaged. As anterograde amnesia affects memory following a brain injury, it is typical for a patient to retain their long-term memories from before the incident.

Retrograde amnesia

Retrograde amnesia is where a patient who has suffered a brain injury cannot remember information from before the injury. This type of amnesia can be specific to one memory, such as the traumatic incident that caused the injury, or it can be limited to a specific time frame. In severe cases, patients can forget who they are and where they come from. It is possible for people with retrograde amnesia to regain some or all of their lost memory.

Apply it

Mataius fell off his bike and bumped his head. He lost consciousness for several minutes. When he came round, he could not remember what had happened to him or that he had been out on his bicycle. Explain Mataius's memory loss.

Develop it

Henry Molaison (often referred to as H.M.) is a famous case of anterograde and retrograde amnesia in psychology. Henry Molaison underwent brain surgery to relieve him from seizures associated with epilepsy. Unfortunately a brain structure called the hippocampus was damaged during the operation. This resulted in him suffering from anterograde amnesia, so he could not lay down new memories. The surgery also caused retrograde amnesia as he was able to recall childhood events, but lost the ability to recall experiences a few years before his surgery. He was studied over a long period of time. Since his death Henry's brain has been used to further research memory and understand the causes of amnesia. His case is widely documented on the internet for you to read about.

Key terms

Amnesia: memory loss, often through accident, disease or injury.

Anterograde amnesia: a memory condition that means new long-term memories cannot be made; this is typically caused by injury to the brain.

Retrograde amnesia: a memory condition that affects recall of memories prior to an injury to the brain.

Memory – How does your memory work?

Bartlett's (1932) Theory of Reconstructive Memory

What you will learn

- The concept of 'schemas' in psychology and how they are formed.
- How schemas influence memory.
- The strengths and weaknesses of Bartlett's (1932) Theory of Reconstructive Memory.

Before we thought of the brain as a computer, psychologist Sir Frederic Bartlett came up with a theory of how memory worked. His theory is called the Theory of Reconstructive Memory.

Memory and schemas

Bartlett proposed that memories are not stored as an exact form as in a computer. Instead, our memories are notes about what we experience, like jotting down a brief outline on a notepad. When we come to recall these memories, we simply retrieve the notes and elaborate on them using our general knowledge about similar events. This means that memories are not exact copies of an event but an interpretation – an **active reconstruction**. Bartlett referred to this general knowledge as **schemas**. They are unique to us and develop over time through our own experiences.

Schemas are packets of information, a bit like scripts, about events or situations. For example, we have a schema for going to a restaurant, which includes a general understanding of that event: being ushered to a table, selecting food from a menu, paying the bill and so on. When we recall going to a specific restaurant, we draw upon this schema to reconstruct the event itself. This may mean that we recall choosing a meal from a menu when in fact there was a set menu, which results in a subtle reconstruction of the original event.

Key terms

Active reconstruction: memory is not an exact copy of what we experienced, but an interpretation or reconstruction of events that are influenced by our schema (expectation) when we remember them again.

Schema (memory): a packet of knowledge about an event, person or place that influences how we perceive and remember.

Try it

Test reconstructive memory yourself. Using a familiar place, such as a classroom, place a few unusual objects in the room, such as a hairbrush or teddy (do not place objects that are too obvious). Ask participants to look around the room and, afterwards, list what objects they remember. According to the theory of reconstructive memory, they will use their schema to remember what they saw, so they should remember objects that are typically found in a classroom and not the unusual objects you placed.

Link it up

Piaget explored how schemas develop in early childhood. Find out more about Piaget's ideas in Topic 1 *Development*.

How schemas are formed

According to Bartlett, our schemas are formed throughout our lives through experiences. Just as we build language through an increasing vocabulary, we build schemas through personal experiences. This means that although some schemas are shared within a particular culture, such as what is meant by going to school, other schemas are unique and personal to us.

How schemas influence memory

Using various pictures and stories, Bartlett tested how schemas influence memory. He found that, over time, people recalled the pictures and stories differently because they were influenced by their schemas. Schemas influence our memory and cause us to ignore or change details when we recall them.

In particular, Bartlett found that recall displayed:

- **Omissions** – we leave out unfamiliar, irrelevant or unpleasant details when remembering something. Our schema simplifies the information.
- **Transformations** – details are changed to make them more familiar and rational.
- **Familiarisation** – we change unfamiliar details to align our own schema.
- **Rationalisation** – we add details into our recall to give a reason for something that may not have originally fitted with a schema.

Strengths and weaknesses of the theory

Apply it

Ali was loading his shopping into the boot of his car when he heard shouting and a loud bang. The next day he tried to describe the event to his friend.

Explain what Ali might have remembered about the event. Use your knowledge of reconstructive memory in your answer.

A strength of Bartlett's (1932) Theory of Reconstructive Memory is that it has real-world practical application and helps us understand why memory can become distorted. An eyewitness to a crime, for example, can misremember certain events, which may lead to the wrong person being prosecuted for an offence. To avoid this, the police now use an interviewing technique called the **cognitive interview**. This technique encourages an eyewitness to avoid omissions and transformations in their testimony.

Develop it

Find out more about the cognitive interview by conducting your own internet search. Reconstructive memory has also led to further research into the active nature of memory by one of the world's most influential cognitive psychologists, Elizabeth Loftus. Extend your knowledge by finding out what studies she has conducted.



How could reconstructive memory affect eyewitness accounts?

Key terms

Omission: when we leave out unfamiliar, irrelevant or unpleasant details when remembering something.

Transformation: when details are changed to make them more familiar and rational.

Familiarisation: when unfamiliar details are changed to align with our own schema.

Rationalisation: when we add details into our recall to give a reason for something that may not have originally fitted with a schema.

Cognitive interview: a police interview designed to ensure a witness to a crime does not actively reconstruct their memory.

Memory – How does your memory work

Key terms

Ecological validity: the extent to which the findings still explain the behaviour in different situations.

Subjective: based on personal opinion or feelings.

Bartlett conducted his research using folk stories and images, often asking participants to remember them hours, days or even years later. His methods can be viewed as a test of memory in the real world because remembering stories is a realistic use of memory. In this way, the findings of his research, and therefore his Theory of Reconstructive Memory, can be seen to be **ecologically valid**.

Link it up

For more information on ecological validity and subjectivity, see Topic 11 *Research methods*.

Bartlett developed his theory by reading through and interpreting the pictures and stories reproduced by participants. He analysed each story and picture himself and gave his own interpretation of the material the participants recalled. Some would argue that Bartlett's own interpretation may differ from another person's. This would mean that Bartlett's findings could be **subjective**, which is considered unscientific. If the findings of his research are seen as unscientific, it would undermine his Theory of Reconstructive Memory.

Bartlett was not particularly scientific in his procedures. He was more interested in each participant's unique memories rather than the use of standardised procedures and controls. This may weaken the research that was used to form the theory.

Link it up

You need to learn about one of Bartlett's studies, 'War of the Ghosts', which is described later in this Topic. Read ahead and see how participants' recall of this story became simplified and transformed.

Exam-style question

Explain why two people who experienced the same event may recall the event differently. You should refer to reconstructive memory (Bartlett, 1932) in your answer. **(2 marks)**

Exam tip

When asked to 'refer to your knowledge of' a theory or research in your answer, it is important to use key terms described in the theory or study. For example, if you are asked to refer to your knowledge of reconstructive memory, enhance your explanation where you can by incorporating key terms, such as schema, active reconstruction, omission, rationalisation and familiarisation.

Atkinson and Shiffrin (1968) Multi-store Model of Memory

What you will learn

- The sensory register.
- The capacity and duration of short-term and long-term memory.
- The role of attention and rehearsal in memory.
- The strengths and weaknesses of the theory of separate memory stores.

Richard Atkinson and Richard Shiffrin developed the Multi-store Model of Memory (1968) by drawing conclusions from memory experiments conducted by other researchers. By pulling together this research, they were able to identify three distinctly different stores in our memory system:

- the **sensory register** (or sensory memory)
- short-term memory
- long-term memory.

Although it is commonplace now to think of our memory as having different stores, at the time there was some disagreement about whether memory was one entity or a series of separate ones. Atkinson and Shiffrin proposed that memory stores differ from each other in the way information is encoded, their capacity and duration, and how information is retrieved (see Figure 2.1).

The sensory register and the role of attention

Think about all of the sensory information around you in your environment, each image that hits your eyes, every sound detected by your ears. Then you can understand that we register a lot of information very briefly, but we do not pay **attention** to all of it. For example, at a party we register noise around us as people talking and music. However, we do not pay attention to all of it, just the conversation we are having with a friend.

The sensory register is the store that receives all of the sensory information around us and holds it very briefly. If we pay attention to some of this sensory information, it is transferred into our short-term memory where we can process it further. If we do not pay attention to the information, it quickly decays.

It is believed that we have a separate sensory register for each of our principle senses. The sensory registers for vision have been researched the most.

Try it

You can test your sensory register by using slides on a computer. Write a series of three **trigrams** on a slide and set the timing to 0.5 seconds. Swap with a partner and run the slideshow. Try to remember as many letters as you can.

Example:

B G W

H J E

P V D

You will be able to recall a few of the letters and also experience the sensation of decay as the memory trace is rapidly forgotten.

Try it

In a safe place, sit quietly and concentrate on what sensory/environmental information is being received by your five principle senses – that is, what you can see, hear, feel/touch, smell and taste. These sensations are being received by your sensory register at any one time. Although you may not pay attention to all of them, they are being registered.

Key terms

Sensory register: our immediate memory of sensory information.

Attention: focus on certain sensory information.

Trigram: a set of three letters such as GPX that makes a meaningless string of letters rather than a word.

Memory – How does your memory work?

- **Iconic memory** – the sensory register for visual information that lasts for around 1 second before visual information decays.
- **Echoic memory** – the sensory register for auditory (sound) information that lasts for a few seconds before sound information decays.

The other sensory registers are:

- the gustatory (taste) sensory register
- the olfactory (smell) sensory register
- the tactile (touch) sensory register.

Key term

Iconic memory: the sensory register for visual information.

Echoic memory: the sensory register for auditory (sound) information.

Modality free: not linked to a specific type of sensory information.

Link it up

Peterson and Peterson (1959) researched the duration of short-term memory. Read ahead to find out more about their study.

Short-term memory: capacity and duration

Atkinson and Shiffrin describe how information that we pay attention to gets transferred into short-term memory where it can be stored for around 15–30 seconds (Atkinson and Shiffrin, 1971). If we rehearse this information, we are able to maintain it in short-term memory for much longer. They describe short-term memory as **modality free**. This means that it can store different types of information from any of our senses, although in their theory they only describe visual and auditory information.

In 1956, psychologist George Miller found that the average short-term memory can hold between five and nine chunks of information. A chunk of information tends to be a grouping, such as the way we group the numbers of a phone number.

The role of rehearsal

The Multi-store Model of Memory suggests that repeating information over and over helps to hold it in short-term memory for longer. If the information is rehearsed for long enough, it gets transferred into the long-term memory store. Rehearsal refers to repeating things out loud or in our heads in order to remember them, such as saying a phone number over and over again.

Long-term memory: capacity and duration

Long-term memory can hold information indefinitely and it has potentially limitless capacity. Long-term memories are thought to be mainly organised semantically, that is, according to their meaning.

Strengths and weaknesses of the theory

There is a lot of evidence to support the theory of separate memory stores. Cases of amnesia show how brain injury can damage long-term memory, while short-term memory remains intact. Other evidence from memory experiments have also shown the distinction between short-term and long-term memory.

Ben Murdock (1962) conducted an experiment to provide evidence for the Multi-store Model of Memory. He discovered something called the serial position effect (Figure 2.2), which is the tendency to recall more words at the beginning (**primacy**) and end (**recency**) of a word list. Murdock explained that the primacy effect occurs because words at the beginning of the list had been rehearsed and transferred into long-term memory. The recency effect is the result of the words still being held in short-term memory. Words in the middle of the list were recalled less because there had not been enough time to rehearse them into long-term memory before they were displaced from short-term memory.

The Multi-store Model of Memory (1968) has been criticised for overstating the role of rehearsal as a means of transferring information into long-term storage. Clearly we do not need to repeat every piece of information over and over again in order to remember it for a period of time. Sometimes we remember things just because they are more meaningful to us.

It is also unlikely that we have only one type of long-term memory. Cases of amnesia patients demonstrate that while some long-term memories are damaged, other types remain intact. One such patient, Clive Wearing, suffered damage to the part of his memory that stored personal events, such as going to university. However, other parts of his memory were intact, such as his memory of how to play the piano. This demonstrates that we do not have one long-term memory store, but perhaps several different types.

Key terms

Primacy: the tendency to recall words at the beginning of a list when asked to remember it.

Recency: the tendency to recall words at the end of a list when asked to remember it.

Develop it

Use the internet to investigate the amnesia patient Clive Wearing. See if you can work out the long-term memories that were damaged and which remained intact. This will give you a better understanding of the different types of long-term memories we have.

Exam-style question

Explain **two** differences between short-term and long-term memory. You should refer to the Multi-store Model of Memory in your answer. **(4 marks)**

Exam tip

It is important to remember the key differences in the memory stores suggested by the Multi-store Model of Memory. You might find that you can remember these better by referring to differences in:

- capacity
- duration
- encoding
- forgetting.

Memory – How does your memory work?

Studies

Bartlett (1932) War of the Ghosts

Key terms

Serial reproduction: a technique where participants retell something to another participant to form a chain; this is how folk stories are passed down through cultures.

Repeated reproduction: a technique where participants are asked to recall something again and again.

What you will learn

- Background to the studies.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the studies.

Background to the study

In his book, *Remembering*, Bartlett wrote about experiments that he conducted using pictures and folk stories. One such story was a North American folk tale called 'The War of the Ghosts' (Figure 2.3). Bartlett chose this story because it would have been unfamiliar to the students and colleagues at Cambridge University who were involved in the study. He hoped the unfamiliarity of the story would shed light on the reconstructive nature of memory because his participants would be more likely to draw on their schemas to recall it.

One night two young men from Egulac went down the river to hunt seals, and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party". They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:

"What do you think? We wish to take you along. We are going up the river to make war on the people."

One of the young men said: "I have no arrows".

"Arrows are in the canoe," they said.

"I will not go along. I might be killed. My relatives do not know where I have gone. But you", he said, turning to the other, "may go with them."

So one of the young men went, but the other returned home.

And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water, and they began to fight, and many were killed. But presently the young man heard one of the warriors say: "Quick, let us go home: that Indian has been hit". Now he thought: "Oh, they are ghosts". He did not feel sick, but they said he had been shot.

So the canoes went back to Egulac, and the young man went ashore to his house, and made a fire. And he told everybody and said: "Behold I accompanied the ghosts, and we went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick".

He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of his mouth. His face became contorted. The people jumped up and cried.

He was dead.

Aims

To test the nature of reconstructive memory using an unfamiliar story, looking at whether or not personal schemas influence what is remembered from the story.

Procedure

Participants were asked to read 'The War of the Ghosts' twice and then were later asked to recall it. Bartlett used both **serial reproduction** and **repeated reproduction** to test the recall of the story. For serial reproduction, participants were asked to read the story and then retell the story to another participant 15 to 30 minutes later. The second participant then told the story to a third participant, and so on.

For repeated reproduction, the same participant was asked to write out the story after 15 minutes. They were then asked to recall the story several minutes, hours, days, months and years later.

Figure 2.2 Bartlett, F.C. (1932) *Remembering: A Study in Experimental and Social Psychology*, Cambridge University Press (original punctuation retained)

Try it

Test reconstructive memory yourself using 'The War of the Ghosts' story or find a different unfamiliar story. You could ask your participants to recall it several times themselves (repeated reproduction) or tell it to someone else (serial reproduction). You should find that the reproductions are shortened because your participants will omit unfamiliar parts. They may also change parts to make them more conventional/familiar. Read through the reproductions and make a note of what changes are made and consider why this has happened.

Results

Bartlett used qualitative analysis to look for and interpret changes to the stories that were recalled. He found that repeated reproductions tended to follow a similar form, which means that the theme or outline of the first reproduction tended to remain in later reproductions.

For both types of recall, participants tried to make sense of the 'odd' story by giving it meaning. This resulted in additions or changes such as making connections or giving reasons for events. This is known as rationalisation. For example, participants often recalled the original sentence of 'Something black came out of his mouth' as 'a man's dying breath' or 'foaming at the mouth'.

Participants also tended to leave out unfamiliar or unpleasant parts of the story, particularly the unfamiliar place names. Lots of details became familiarised and simplified. For example, 'canoe' became 'boat' and 'hunting' was recalled as 'fishing'.

Link it up

Find out more about qualitative analysis in Topic 11 *Research methods*.

Conclusion

Bartlett interpreted the results as evidence for the active and constructive nature of memory. Participants did not recall the story fully or accurately. Instead, they omitted details that did not fit with their schema and some details were altered by the influence of their schema.

Exam-style question

Explain **one** way that Bartlett found that 'The War of the Ghosts' story changed when it was remembered. **(2 marks)**

Exam tip

You may be asked specific information about key studies mentioned in the specification. You should be prepared to learn these studies in depth.

Memory – how does your memory work?

Key term

Reliable: when the outcomes of a study are consistent.

Statistical analysis: mathematical calculations performed on data to see whether the findings could be due to chance.

Standardised procedure: where the procedure of a study is the same across all conditions.

Link it up

The concepts of control, standardised procedure, statistical analysis, ecological validity and reliability are further explained in Topic 11 *Research methods*.

Strengths and weaknesses of the study

The use of a story as recall material can be considered to be both a strength and a weakness of the study. Remembering a story is more naturalistic as a test of everyday memory than nonsense trigrams or lists of digits used by other memory researchers, giving the study ecological validity. However, the story was not familiar, it was illogical and contained strange words and concepts. In this way, remembering the story was not an everyday task or a realistic use of memory after all.

Bartlett replicated his procedure using various stories and pictures and found participants had the same tendency to omit and transform the material when remembering. This gives strength to the study because the same findings have been found across other studies. This demonstrates that the findings of the study are **reliable**.

The results of the study were gathered using qualitative analysis. Gathering qualitative data can be seen as a strength because the real nature of reconstructive memory can be understood through its meaning. At the time of the study, use of **statistical analysis** was not commonplace for psychologists, and it was probably appropriate for him to use qualitative analysis to see how individuals changed their version of the story over time.

This being said, some regard qualitative analysis as unscientific because Bartlett could have interpreted the participants' recalled stories in light of his own theory and ideas on reconstructive memory.

Bartlett did not always get participants to recall the story at the same time intervals and he allowed each participant to read the story at their own normal reading pace, so this study can be criticised for lacking good controls. Normally an experiment follows strict timings and a **standardised procedure**. This means that Bartlett's (1932) study is not as scientific as it could have been.

Sum it up

Bartlett's (1932) pioneering research has paved the way for modern-day thinking about the reconstructive nature of memory. Although his procedures were not necessarily scientific, his work reflected a qualitative nature that helps us to understand everyday human memory.

Apply it

Malik was given an owl drawing to look at. At various time intervals, Malik was asked to redraw the original image without being allowed to see it again.

Suggest one change that might happen to this picture (Figure 2.3) and explain why you think the change would happen.



Figure 2.3 Original drawing

Peterson and Peterson (1959) Short-term Retention of Individual Verbal Items

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Lloyd and Margaret Peterson conducted a laboratory experiment to investigate the duration of short-term memory. As we can hold information in short-term memory by rehearsing it over and over, they could only test the true duration of a short-term memory trace by interfering with this rehearsal process. To prevent participants from rehearsing, the Petersons got them to count backwards in threes.

Aim

To test the true duration of short-term memory.

Procedure

Twenty-four students were tested individually. Each student was asked to repeat out loud a set of letters that they heard. The letters were three consonants (a trigram). Immediately afterwards, they were asked to say out loud a three-digit number read to them by the experimenter, and then count backwards in threes or fours from that number. For example, the trigram BFP would be repeated and then 709, 706, 703 and so on.

When signalled by a red light, each student had to recall the trigram. Each student had to recall the trigram eight times. They did this with time delays of 3, 6, 9, 12, 15 and 18 seconds. In total, the procedure was repeated 48 times using different trigrams.

A second experiment asked participants to do the same tasks, but some were given time to repeat the trigram before counting backwards (silently or vocally).

Results

Their results showed that the longer each student had to count backwards, the less able they were to accurately recall the trigram. When asked to count backwards after 3 seconds, they remembered over 80 per cent of trigrams correctly, but after 18 seconds the percentage of correct recall was less than 10 per cent.

In the second experiment, they found that this extra time increased the frequency of recall because they were able to consolidate the information a little more. It did, however, show a similar decline over time.

Conclusion

With the participants unable to rehearse the trigrams, the Petersons concluded that information held in our short-term memory fades rapidly and only 10 per cent could be recalled after 18 seconds.

Try it

Replicate Peterson and Peterson's procedure in a basic way. Split your participants into three groups. Read out a list of trigrams to all of them and then ask them to count backwards in threes from a fixed number. Stop one group counting backwards after 3 seconds, the second group after 9 seconds and the final group after 18 seconds. Count up how many words were recalled by each group and compare the findings.

Memory – how does your memory work?

Strengths and weaknesses of the study

The researchers used fixed timings for participants to count backwards from. They also eliminated noise and other factors that could have had an influence on memory. The research can therefore be said to have good control, using standardised procedures to make sure all participants experienced the same process. This means that the study is scientific because it can be replicated and the reliability of the findings can be checked to make sure they were not a one-off result.

One important practical application of this study is that it demonstrates how interference in the form of verbal distractions can affect our ability to retain information. This implies that when we are revising for an exam or trying to memorise a shopping list before we go to the shop, we should take care to avoid distractions.

Key terms

Extraneous variables: variables that could affect the results of a study.

Mundane realism: a realistic, everyday task.

Lots of memory research tends to use nonsense trigrams for participants to remember because real words could have personal relevance for some participants but not others, which makes them more or less memorable. **Extraneous variables** such as these are important to control, which this study does by using trigrams. However, this part of the procedure can be criticised as it is not how we would typically use our memory in everyday situations. This means the procedure lacked **mundane realism**.

Sum it up

This is a useful study that informs us about the actual duration of our short-term memory which can be used to help us remember things. Although the research can be criticised for not using a procedure that represents everyday memory use, it is often necessary to do this in order to measure uncontaminated short-term memory. The scientific credibility of this research study is high as a result.

Link it up

Find out more about standardised procedures and extraneous variables in Topic 11 *Research methods*.

Apply it

Elliot gives his new mobile phone number to his friend, Fraser. Fraser needs to find his phone so that he can save Elliot's number in his contacts, so he rushes to the student common room to find it. On the way, Fraser is stopped by a teacher and asked about a football match that he played in the day before. When Fraser makes it to the common room a minute later, he has completely forgotten Elliot's new mobile number.

Using your knowledge of the Peterson and Peterson (1959) study, explain why Fraser forgot Elliot's mobile number.

Issues and debates

Reductionism and holism debate

What you will learn

- The reductionism and holism debate, including key terms.
- Research, theories and concepts drawn from the study of human memory to explain the debate.

Reductionism

Reductionism is the scientific theory of describing something using its basic parts or the simplest explanation. Reductionism is based on the belief that any human behaviour or cognitive (thought) process can be best explained by looking at the parts that make up that behaviour or process to understand how it works.

Scientists often reduce complex behaviour into basic parts because it means that we can be more certain that one thing causes another. This helps us investigate what causes a behaviour. For example, if we explain aggression as a result of a certain gene, we can test for the gene and see if it is associated with someone being more aggressive than a person without that gene.

Reductionism is associated with scientific methods such as laboratory experiments, where factors that may explain a behaviour can be isolated and tested under controlled conditions. A theory or study that describes a behaviour by a single, simple explanation can be said to be **reductionist**.

Reductionism is a desirable scientific practice and can be appropriate in circumstances where there is a clear, single explanation. However, reductionism can result in an explanation that is overly simplistic. It may mean that we ignore other causes of that behaviour or the interaction effects between multiple causes. For example, in explaining aggression according to a single gene, we may miss other social factors that could contribute to aggression, such as upbringing, or miss the interaction between the aggression gene and other factors.

Key terms

Reductionism: the theory of explaining something according to its basic constituent parts.

Reductionist: the practice of reductionism.

Apply it

During a class debate on the causes of eating disorders, Portia said that she thought anorexia was a mental illness caused by a problem in brain functioning. Reem disagreed and stated that she thought the media was responsible as it portrayed images of slim models. Nick agreed with both of these ideas, but added that some cultures do not have eating disorders, so there must be something that happens in certain cultures that influences the development of anorexia.

Explain to what extent the students' ideas about eating disorders are reductionist.

Memory – how does your memory work?

Key terms

Holism: the theory of explaining something as a whole.

Holistic: the practice of holism.

Holism

Holism is the opposite of reductionism, so can be explained as the theory of trying to understand the whole behaviour rather than its parts. To be **holistic** is to try to understand the whole person. This approach takes into account the fact that many different factors work together to cause a behaviour, and therefore dividing up these factors is not useful in understanding the behaviour as a whole.

For example, a cake can be described by a list of ingredients that went into making it. Each ingredient contributed to the taste, texture and smell of the cake. However, you need all the ingredients working together, interacting during the baking to make the cake, otherwise it would not work. Holistic psychologists believe that the whole is greater than the sum of its parts.

Holistic psychologists tend to use qualitative methods to gain greater insight into the causes of behaviour and try to understand the whole person and their beliefs. In practice, holism can be difficult to achieve because understanding the whole individual means investigating lots of variables at the same time. It is also regarded as unscientific because the findings can only apply to a particular individual – the resulting theories cannot apply to everyone else.

How the reductionism/holism debate applies to human memory research

The area of cognitive psychology concerned with memory, and other cognitive processes, is generally regarded to be reductionist (Table 2.2).

Atkinson and Shiffrin's (1968) Multi-store Model of Memory can be seen as reductionist as it describes our memory as a series of component memory stores with specific functions, such as rehearsal. Research using experiments that investigate how memory works can also be regarded as reductionist as experiments tend to isolate variables to investigate, without considering other factors that could also explain the behaviour.

Reductionist	Holistic
The information processing approach	Reconstructive memory
The Multi-store Model of Memory	Qualitative analysis
Experiments	

Table 2.2 Reductionism/holism applied to memory research

However, Bartlett's work cannot be considered reductionist because of the way he conducted his research. Bartlett used qualitative analysis to explore the reconstructive nature of memory by understanding how each individual's schemas influenced their recall of stories and pictures. He spent considerable time establishing the character and backgrounds of his participants in order to understand how their schemas were formed. For example, he found out what jobs they had in order to see whether their training and employment might have influenced how they remembered things.

Exam-style question

Cornelius conducted laboratory experiments to investigate how short-term memory is affected by interference. He played loud music to his participants while they were trying to remember a list of digits.

Assess to what extent memory research is reductionist. **(9 marks)**

Exam tip

Your knowledge of issues and debates in psychology will be tested in an essay that uses the command word 'assess'. This means that you will need to give an answer that describes, applies your knowledge and forms a judgement. For this particular essay question, you should:

- describe to what extent memory research is reductionist
- apply your knowledge to the scenario involving Cornelius's investigation – identifying what aspects would be considered reductionist
- judge the nature of reductionism in memory research by giving strengths and weaknesses
- form a reasoned conclusion.

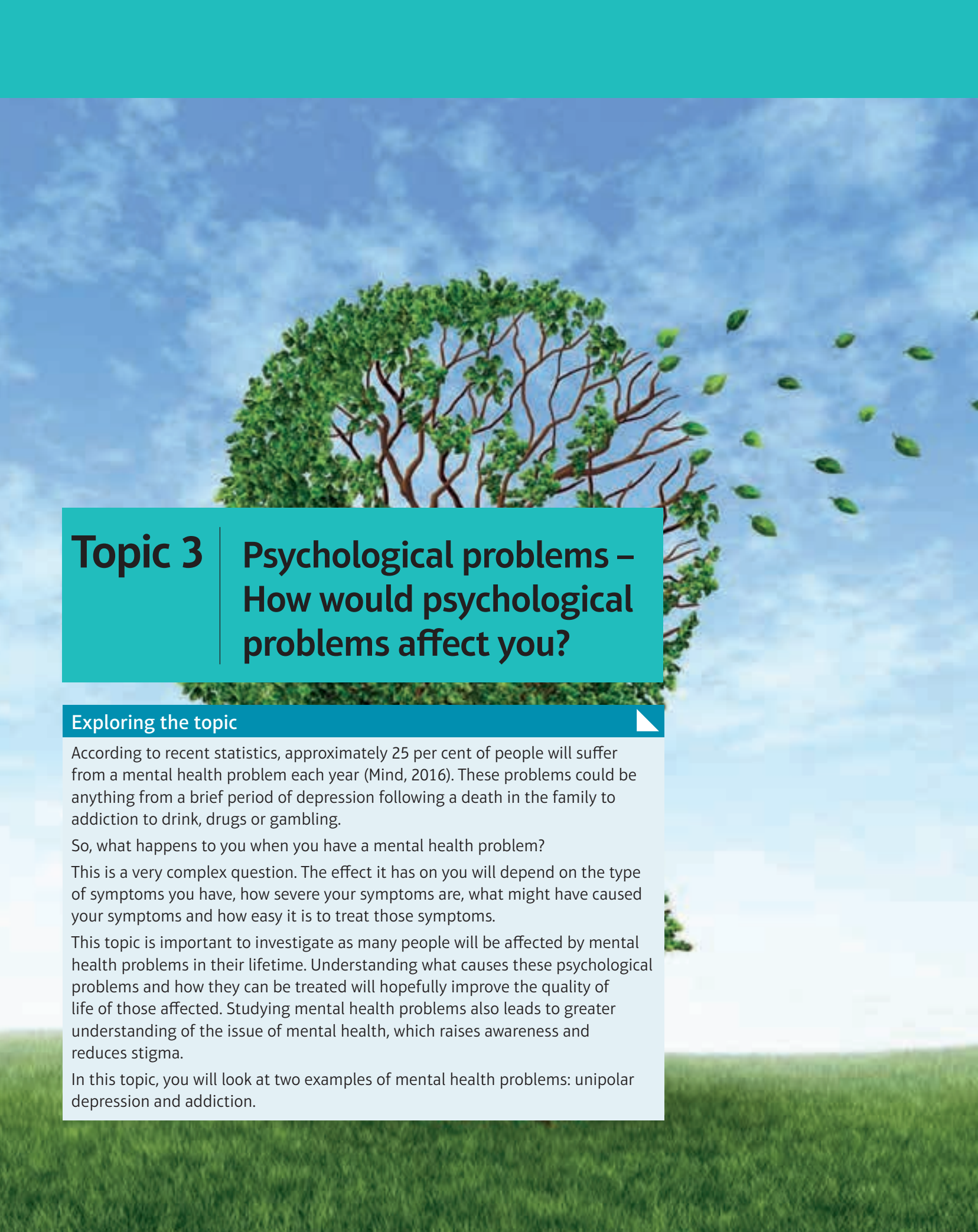
Psychology in action

Memory research has led to an understanding of how and why we remember and forget. This has been especially important in helping people with memory problems such as amnesia. It has also been useful to support the elderly and people suffering from dementia. Dementia is a disease that affects memory. It affects short-term memory first, and then long-term memory also starts to deteriorate.

Cognitive Stimulation Therapy is used to help improve memory and other cognitive skills. This involves activities that have been developed because of research into memory conducted by psychologists. Cognitive Stimulation Therapy involves playing memory games, such as thinking of childhood events, word association, categorising objects, remembering songs and so on.



Cognitive Stimulation Therapy uses our knowledge of memory to help people suffering from memory loss caused by dementia



Topic 3 | Psychological problems – How would psychological problems affect you?

Exploring the topic

According to recent statistics, approximately 25 per cent of people will suffer from a mental health problem each year (Mind, 2016). These problems could be anything from a brief period of depression following a death in the family to addiction to drink, drugs or gambling.

So, what happens to you when you have a mental health problem?

This is a very complex question. The effect it has on you will depend on the type of symptoms you have, how severe your symptoms are, what might have caused your symptoms and how easy it is to treat those symptoms.

This topic is important to investigate as many people will be affected by mental health problems in their lifetime. Understanding what causes these psychological problems and how they can be treated will hopefully improve the quality of life of those affected. Studying mental health problems also leads to greater understanding of the issue of mental health, which raises awareness and reduces stigma.

In this topic, you will look at two examples of mental health problems: unipolar depression and addiction.

Your learning

In this topic you will learn about:

- the symptoms and features of two mental health problems: unipolar depression and addiction
- how the number of people diagnosed with depression and addiction has changed over time
- how depression and addiction affect individual people and society as a whole
- the influence of genes on mental health and addiction
- the use of cognitive theory as an explanation of depression
- the use of learning theory as an explanation of addiction
- the use of cognitive behavioural therapy (CBT) as a treatment for depression and addiction
- the use of drugs as a treatment for depression and addiction
- studies investigating mental health by Caspi et al. (2003) and Young (2007)
- issues and debates around the nature and nurture debate.

Getting started

Imagine you have begun to feel that something 'is not right' with your mental health. Maybe you are feeling very upset all the time and want to stay at home on your own rather than go to school or see your friends. Maybe you have started smoking and now want to quit, but are finding it really difficult to do so. Or maybe you just do not feel 'like yourself' anymore. What would you do?

Discuss with a partner what you could do if you feel your mental health is becoming a problem. Only share information with your partner that you are happy to discuss. If there are issues you are facing that you are worried about, you should talk to your parents, a teacher or someone else in your school, such as a nurse or health officer.



What would be the most important features of a therapy session for a patient with mental health problems? For example, would they want to feel supported? Understood? Calm?

Unipolar depression: symptoms, features, incidence and influence

What you will learn

- The symptoms and features of unipolar depression that diagnose this as a mental health problem.
- How the number of people diagnosed with unipolar depression has changed over time.
- How unipolar depression can affect individual people and society in general.

Key terms

Unipolar depression: a type of mood disorder causing periods of feeling sad and lacking motivation to do everyday activities.

Mental health problem: a form of psychological problem characterised by symptoms affecting your mind and behaviour; they can affect how you think, how you feel, how you behave or how you relate to other people.

Unipolar depression describes the type of depression that most people are familiar with – the type where people suffer from periods of feeling ‘down’. It is called ‘unipolar’ because it refers to someone’s mood being pulled in one (uni) direction. This is different to bipolar depression where patients have ‘mood swings’ from very low (sad) to very high (manic happiness).

Symptoms of unipolar depression

According to the International Classification of Diseases version 10 (ICD-10), unipolar depression is also known as ‘depressive episodes’. These are a type of **mental health problem** characterised by mood disorders. Mood disorders affect how people feel; unipolar depression makes people feel very ‘low’. These episodes of depression are the periods of time where the symptoms are present in the patient, and they can be classed as ‘mild’, ‘moderate’ or ‘severe’.

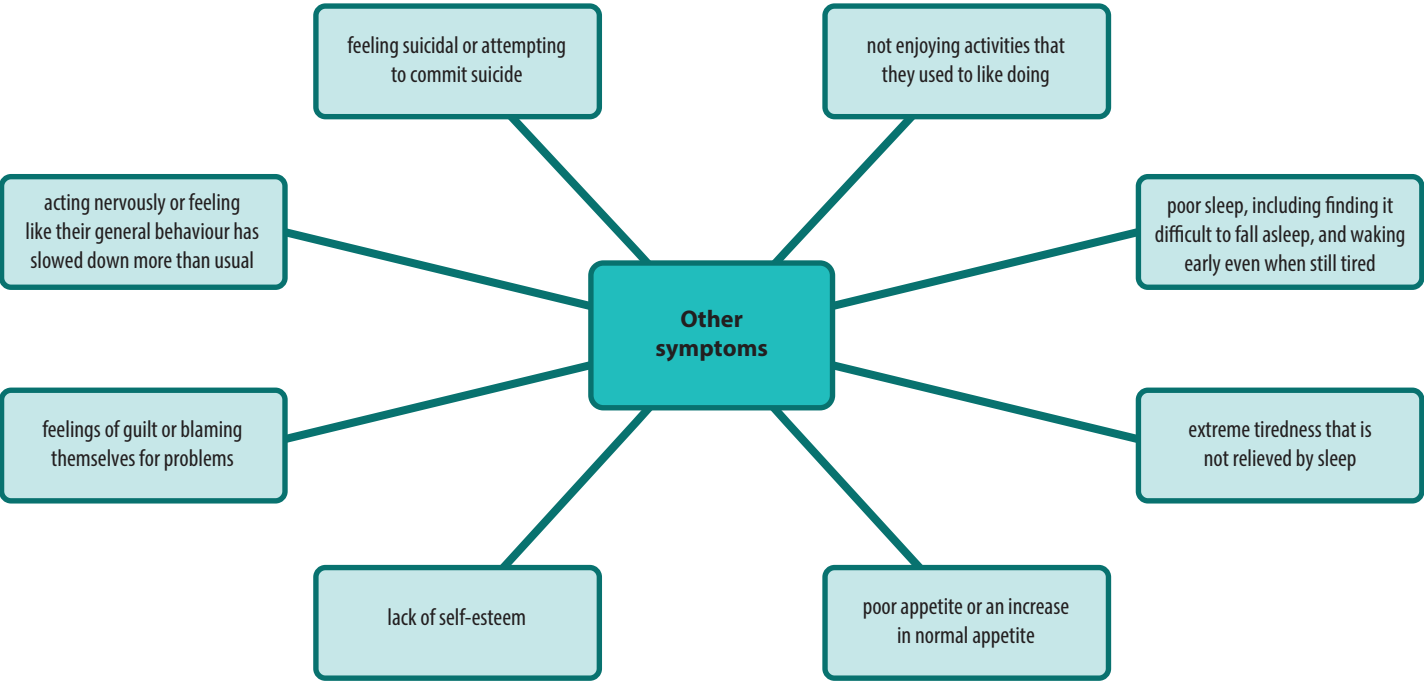


Figure 3.1 Other symptoms associated with unipolar depression

The main symptoms of unipolar depression are:

- lowering of mood – feeling very sad or upset
- lack of energy even after resting for a long time
- lack of motivation to do things.

For a diagnosis of unipolar depression, the ICD-10 requires that at least one of these main symptoms should be present most of the time on most days for at least two weeks. In addition, another one of these symptoms should be present at some point during that time.

Features of unipolar depression

According to the World Health Organization, approximately 1 in 15 people will suffer from an episode of serious depression every year. They also state that unipolar depression affects twice as many females as males, and also seems to affect women for longer than it does men.

Episode	Symptoms	Features
Mild	Four symptoms displayed	A patient might find their symptoms upsetting but they will probably be able to carry on with most day-to-day activities
Moderate	Five or six symptoms displayed	A patient might have serious problems doing day-to-day activities, such as going to work or to school
Severe	Seven or more symptoms, plus general feelings of worthlessness	A patient may have suicidal thoughts or engage in self-harm to cope with their feelings

Table 3.1 Symptoms and features of episodes of unipolar depression

Apply it

Marzia has missed a lot of school recently and her parents are very worried about her. She is sleeping a lot more than normal, but constantly feels tired. On days when she does not go to school, Marzia spends most of her time in bed, not even getting up to eat regularly. When her parents try to talk to Marzia about how she is feeling, she usually ends up in tears and says she just feels so sad all the time.

Her parents take her to see the doctor, who says Marzia is showing some symptoms of depression.

Using your knowledge of unipolar depression, explain why Marzia's symptoms might lead her doctor to think she is suffering from depression.

Incidence of depression over time

There is a feeling that more people are diagnosed with depression nowadays than in the past. For example, Martin Seligman (1988) reported that in the 1980s people were 10 times more likely to be diagnosed with depression than they were in the 1940s. A report by The King's Fund (2008) on mental health in England estimates that by 2026, 1.45 million people will be diagnosed with depression, compared to 1.24 million in 2007. This could be because more people are aware of the symptoms of depression. Or it could be, as Brandon Hidaka (2012) suggests, that 'modern living' is more stressful and includes many risk factors for depression, such as sleep deprivation, poor diet and increased social isolation.

One age group where a large increase in diagnosis has been seen is in teenagers and young adults. Jean Twenge et al. (2010) found that young adults in 2007 were significantly more likely to be diagnosed with depression, along with other forms of psychological problems, than they were in 1938. This could suggest that modern life for this age group is particularly stressful. Some research has even linked high levels of social media usage to higher risk of depression in young American participants (Liu yi Lin et al., 2016).

How depression affects individuals and society

One major effect unipolar depression can have on individuals is increasing the risk of suicide. The feelings of worthlessness and sadness in depression can make people feel as if they need a 'way out'. If they think that other people will not care if they are around, then suicide might feel like their only option. It has been suggested that 10–15 per cent of patients with severe depression will commit suicide.

Depression also has an effect on society in general. One example is the amount of time missed from work by patients. The Health and Safety Executive (HSE.gov.uk) estimated that in 2014–15, 9.9 million days of work were missed because of stress, depression or anxiety associated with work. People with depression lack motivation, which may make getting up and going to work very difficult. They may also find a day of work demanding if they are tired from lack of sleep. As a result, they may get behind in their work, leading to feelings of guilt, which may add to their depression. As well as the impact on the individual, there are cost implications for the company employing them as they have to cover their workload.

Another effect on society created by depression is the cost of treatment to patients. More people are being diagnosed with depression, meaning that more people will require treatment. Antidepressant drugs can be used to treat depression, but they can be expensive to prescribe. Other therapies, including counselling, can also be offered but therapists need to be trained and made available. Figures from 2007 estimate that treatment for patients with depression cost the NHS £1.7 billion in that year alone. This could put a strain on services provided by the NHS.

Genetic explanation of unipolar depression

What you will learn

- How the influence of genes can explain why people develop unipolar depression.
- The strengths and weaknesses of this explanation.

There is evidence that if someone in your family has been diagnosed with unipolar depression then there is a higher risk that you will also be diagnosed with depression. This suggests that unipolar depression might be inherited through genes shared by family members. However, not everyone in a family will develop depression, so it is not clear exactly what role genes play in causing depression. A recent study by Craig Hyde et al. (2016) found that 17 different gene variations were linked to developing depression. This means that there are many different possible combinations of genes a person could inherit that would lead to depression, which makes identifying the people at risk from developing depression quite a challenge.

Twin studies

Twin studies are useful for looking at the influence of genes. Identical twins (**monozygotic**) share 100 per cent of the same genes, while non-identical/ fraternal twins (**dizygotic**) share only 50 per cent – the same as other siblings share. A study by Peter McGuffin et al. (1996) found that if one monozygotic twin became depressed, there was a 46 per cent chance that their co-twin would also develop depression. However, if a dizygotic twin became depressed, there was only a 20 per cent chance that the other twin would also develop depression. This shows that depression might be genetic because the monozygotic twins, who share more genes than the dizygotic twin pairs, were at greater risk of becoming depressed if one of them was diagnosed.



Monozygotic twins are genetically identical, meaning that all of their genes are exactly the same

Key terms

Twin studies: research that compares behaviour in groups of twins to see if there are similarities in each pair of twins.

Monozygotic twins: twins developed from one fertilised egg that has split into two; monozygotic twins are genetically identical.

Dizygotic twins: twins developed from two different eggs fertilised during the same pregnancy; dizygotic twins are not genetically identical.

Psychological problems – How would psychological problems affect you?

Not all family members related to someone with depression will go on to become depressed themselves. One reason for this could be that there needs to be a trigger from the environment in order for the gene to become 'active'. This would mean that some people might have a **genetic predisposition** to become depressed because they have a gene that increases their risk. However, they would only go on to become depressed if they are put into a stressful situation that triggers the gene's effect on their mood. This combined explanation for depression is often called the **diathesis-stress model**.

Link it up

Avshalom Caspi et al. (2003) found evidence that life stress combined with genes might help explain depression. Look at the *Studies* section to find out more.

Genes are part of your 'nature', while a stressful event is an example of 'nurture'. Read ahead to find out more about the nature versus nurture debate in the *Issues and debates* section.

Develop it

Carry out some research to find out about other evidence that links genes to depression. Here you have looked at twin studies. Look for some evidence from adoption studies to see what they tell you about the genetic explanation for depression.

Strengths and weaknesses of the genetic explanation

This explanation for depression has several strengths. One strength is that if we can explain depression by looking at the genes people might inherit, we can take away the stigma of being diagnosed with depression. If becoming depressed is in your genes, people cannot blame you for being depressed. This means society might be more accepting of people with mental health disorders such as depression.

Another strength is that lots of research evidence supports the idea that some people are more prone to depression than others. For example Caspi et al. (2003) found that people with a variation of the **serotonin**

transporter gene were more likely to react negatively to stressful life events and develop depression. This would support the claim that genes play a significant role in developing depression.

One weakness of the genetic theory of depression is it is very **deterministic** because it assumes that if you have certain genes you are likely to become depressed, and you have no way to change that. However, some people argue that this is not the case and instead believe you have a certain amount of **free will** to choose whether or not to 'let yourself' become depressed.

Another weakness is that some people argue that the genetic explanation of depression is reductionist because it fails to take into account other factors that can explain why someone may develop depression. People often think depression is linked to life events such as a death in the family or someone losing their job. It is too simplistic to assume that it is just an abnormal gene that makes someone depressed.

Link it up

For more information on determinism and free will, see Topic 7 *The self*.

Reductionism and holism are discussed in *Issues and debates* in Topic 2 *Memory*.

Key terms

Genetic predisposition: a biological tendency to develop a particular behaviour as a result of the genes someone has.

Diathesis-stress model: an explanation for depression that claims people can have a gene that makes them more likely to develop depression, but only if they face a stressful situation that triggers depressive thoughts.

Serotonin: a neurotransmitter associated with controlling mood.

Deterministic: our actions come from what we are born with and what we experience; this is the opposite of having 'free will' or free choice.

Free will: explanations of behaviour that claim we have the ability to choose exactly what type of behaviour we want to show; this is the opposite of being 'determined'.

Cognitive theory as an explanation of depression

What you will learn

- How cognitive theory can be used to explain why people develop depression.
- The strengths and weaknesses of this explanation.

Cognitive theory states that behaviour can be explained by looking at how the brain processes information, and therefore how we think.

Beck's cognitive triad

Aaron Beck thought that depression could be explained by three negative thought patterns that people may develop about themselves, the future and the world (Figure 3.2). These are examples of biases in the way people think (cognitive biases) – things are viewed negatively and the person cannot see the positive aspects of the situations they find themselves in. They see themselves in a negative way, think the world is generally a bad place and think the future is bleak.

Beck felt that this **negative triad** probably develops from bad experiences in someone's past. Once they have a negative way of thinking, they are more likely to perceive things that happen to them in an abnormal way. This leads to negative self-schema where a person's whole belief system about themselves is covered in negativity. For example, they might be prone to **magnification**, which means seeing their problems as far worse than they are in reality.

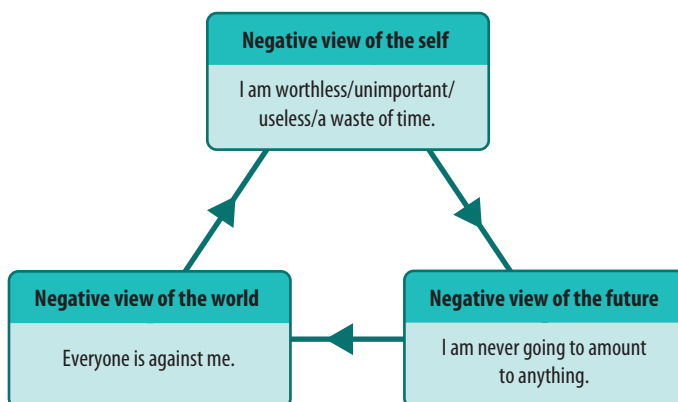


Figure 3.2 Beck believed that if a person has all three types of negative view, then it is likely that they will show symptoms of depression

Ellis's ABC model

Albert Ellis had a slightly different view to Beck about what caused depression. He suggested that there are three stages that might cause a person to develop negative thought processes, which can then lead to them becoming depressed (Figure 3.3).

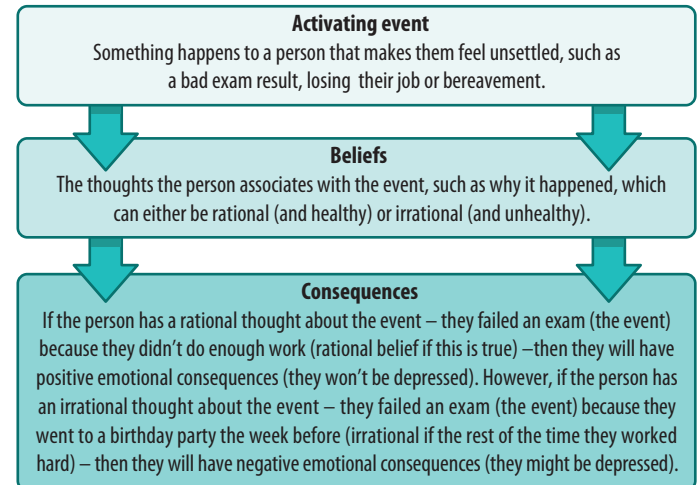


Figure 3.3 Ellis's ABC model

Apply it

Vijay was in a text conversation with Aaron organising a night out for his birthday. Aaron sent a message suggesting they meet at the cinema to watch the new horror film, but Vijay had already been to see the film a few days before. Vijay sent a message back to Aaron saying he had seen the film and would like to go and watch a new comedy instead. Vijay saw that Aaron had read his message, but Aaron did not reply. Explain how the activating event (the ignored text message) could lead to either a rational belief and positive emotional consequence or an irrational belief and a negative emotional consequence depending on how Vijay thinks about it.

Key terms

Cognitive theory: an explanation that focuses on how thought processes influence behaviour

Negative triad: a set of three thought patterns where people feel bad about themselves, the future and the world in general.

Magnification: a form of cognitive bias that makes people see their problems as far bigger than they actually are.

Psychological problems – How would psychological problems affect you?

Key terms

Nature: explanations of behaviour that focus on innate factors (the things we are born with).

Nurture: explanations of behaviour that focus on environmental factors (the things that happen to us).

Cognitive behavioural therapy (CBT): a therapy for mental health disorders that aims to change thought processes in order to reduce symptoms.

Strengths and weaknesses of the cognitive theory explanation

One strength of the cognitive theory explanation of depression is that it takes into account the events in a person's life. It also recognises that these events could explain why the person has become depressed. Unlike the genetic explanation, which claims that some people are just naturally likely to become depressed, the cognitive theory accepts that there is often an event that triggers depression. It is a combination of **nature** and **nurture** factors that make people become depressed.

Another strength of the cognitive theory explanation is that it has been applied to therapy. **Cognitive behavioural therapy (CBT)** is one of the leading treatments for depression. CBT can challenge irrational thoughts people have in order to stop them feeling depressed, reducing the need to use antidepressant drugs.

A weakness is that it is difficult to tell whether irrational thoughts are a cause of depression or a symptom of being depressed. Most people who have depression will only be monitored after they have been diagnosed with the illness. This means that it is unclear how their behaviour or thought processes changed before the diagnosis.

Another weakness is that although some cases of depression can be seen to follow obvious activating events, such as a death in the family, some types of depression may not be so easily explained by thought processes. For example, something like post-natal depression (depression after giving birth) may have a lot to do with changing hormone levels after birth rather than thought processes, which means it may be caused more by biological factors than cognitive ones.

Link it up

The nature and nurture debate is discussed in the *Issues and debates* section at the end of this topic.

Cognitive behavioural therapy as a treatment for depression is discussed in the next section of this topic. Read ahead to find out more.

Exam-style question

- a) Describe the cognitive theory of unipolar depression. **(3 marks)**
- b) Explain **one** strength and **one** weakness of the cognitive theory of unipolar depression. **(4 marks)**

Exam tip

Make sure the main focus of your answer is the cognitive theory of unipolar depression for this question. For part b), you could bring in another theory as an example of a weakness, such as a comparison with the genetic explanation.

Cognitive behavioural therapy (CBT) as a treatment for depression

What you will learn

- How CBT is used to treat people with depression.
- The strengths and weaknesses of using CBT to treat depression.

Cognitive behavioural therapy (also known as CBT) is a type of therapy used to treat many different mental health disorders. The main aim of any form of CBT is to:

- help the patient change the way they think (this is the cognitive part of the therapy)
- help the patient to change the way they act to improve the symptoms they are having (this is the behavioural part of the therapy).

CBT is based on the understanding that the way we think affects how we feel, and how we feel influences how we behave. If a person changes the way they think, their behaviour should also change. In this case, if they change the negative thoughts that make them feel depressed, the symptoms of depression should improve (Figure 3.4).

Develop it

Cognitive behavioural therapy is a general term used to describe therapies that aim to change thought processes to influence a patient's behaviour. Both Albert Ellis and Aaron Beck developed their own version of CBT that could treat depression. Ellis's version of CBT was called Rational Emotive Behaviour Therapy (REBT) and it is based on his ABC model of depression. Beck's Cognitive Therapy is based on his ideas about the cognitive triad. Do some research on these therapies and explain how these two versions of CBT work differently.

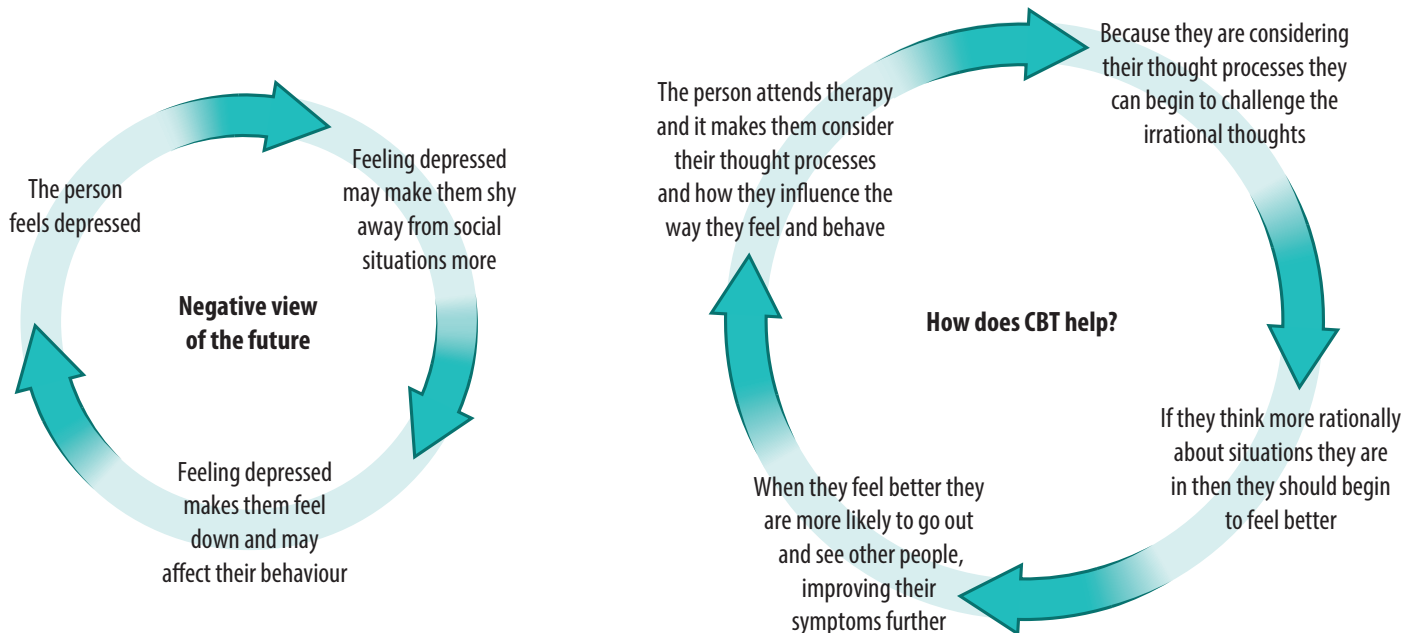


Figure 3.4 How does the process of CBT help to improve the patient's quality of life?

The first stage of CBT for treating depression is for the patient to discuss all their symptoms with the therapist and explain how they feel and what makes them feel this way. For example, someone who has lost their job might feel like a failure because they cannot provide for their family in the same way as they used to.

Psychological problems – How would psychological problems affect you?

The next stage of CBT involves challenging these irrational ways of thinking. When a patient can recognise thoughts that are irrational or negative they should try to replace them with more rational and positive ways of thinking. For example, the person who has lost their job and feels like a failure might be encouraged to look at the reasons they lost their job. There could be a more likely explanation, such as the company having to save money by closing one department.

The patient will have a series of sessions of CBT. Between each session they will have 'homework' to do that might involve trying to change the way they think about a situation and then writing about how they feel in a diary. This stage of the therapy helps them practise using more rational thought processes. They can then discuss this with the therapist at the next session.

Evidence published by the NHS in 2012 suggests that when patients with depression are given CBT alongside their previous treatment (often antidepressants) there is a more significant improvement in their symptoms. This suggests that CBT is effective in treating patients with depression.

Strengths and weaknesses of using CBT to treat depression

One strength of CBT for depression is that there is evidence to suggest it is effective. For example, Matthijs Beltman et al. (2010) found that depressed patients treated with CBT improved more than those who were still waiting for treatment or not receiving any treatment. This suggests that it does help to reduce patients' symptoms.

Another strength is that it may be a longer-lasting treatment for depression than only using antidepressants. Patients learn how to control their symptoms by looking at their own thoughts and trying to change the negative ones. They then have the skills to do this whenever they need to. In contrast, antidepressants can cause problems if they are used for a long time, or they can stop working after a period of time.

A third strength of CBT is that it may help depressed patients feel better because they learn how to deal with their own symptoms. The feelings of helplessness associated with depression can be reduced because the patient has a perception that they can act to do something about their state.

One weakness is that CBT relies on patients wanting to change their behaviour and being able to recognise when their thoughts are irrational. A symptom of depression is lack of motivation, so the patient might not be able to do all the CBT sessions and homework. This would make the therapy ineffective. For this reason, some patients may be offered drug therapy first to alleviate their symptoms and help them prepare for therapy.

Another weakness concerns some ethical issues in the use of CBT. Some people argue that the therapist is encouraging the patient to think that their own thought processes are a problem and that they should think in a different way. This could change the way they interact with others or make some people feel that the way they think and behave is in some way wrong. The implication of this is that the therapist may have the opportunity to abuse their position of power by telling the patient that they should change to suit what the therapist thinks is 'normal' and appropriate.

Link it up

Cognitive behavioural therapy is also used to treat addiction. Read ahead to find out more. You might want to compare how the use of CBT is both similar and different for each mental health problem.

Apply it

Bella has been diagnosed with depression and her doctor has prescribed a course of antidepressants. After 6 months of taking the medication, Bella's symptoms have not improved so her doctor has suggested she also attends CBT sessions regularly. Explain what Bella can expect when she attends her CBT sessions, and how successful this type of therapy might be.

Drug therapy as a treatment for depression

What you will learn

- How drugs are used to treat depression.
- The strengths and weaknesses of drugs as a treatment for depression.

If patients have a history of suffering from moderate or severe depression that keeps coming back, or their depressive symptoms have lasted for a long period of time, then they may be offered drug therapy – using a form of antidepressant. These drugs are also useful for patients with more mild depression if other psychological therapies such as CBT, have not been effective.

Antidepressant drugs work by raising the levels of **neurotransmitters** such as serotonin and **noradrenaline**, which are thought to play a role in controlling our mood. The drugs increase the amount of these neurotransmitters or help to make the neurotransmitters' effects last longer.

Types of antidepressants

Not all drugs that are used to treat depression work in the same way. Different drugs might work better for individual patients because the effect they have will differ slightly.

- **Selective serotonin reuptake inhibitors (SSRIs)** block the **reuptake** of serotonin when it is released from a neuron. This means that the serotonin is available for longer. In turn, this allows more opportunity for other neurons to absorb it, which should help to increase levels of serotonin in the brain, improving mood. These are the most commonly prescribed antidepressants in the UK.
- **Serotonin and noradrenaline reuptake inhibitors (SNRIs)** have a similar effect to SSRIs but they block the reuptake of both serotonin and noradrenaline. This enhances the effect of the available serotonin and noradrenaline for a longer period of time, which also helps to improve mood.
- **Monoamine oxidase inhibitors (MAOIs)** prevent the enzyme monoamine oxidase from doing its job properly. Monoamine oxidase breaks down the neurotransmitters serotonin and noradrenaline after they have been released from neurons. By making it more difficult for monoamine oxidase to do this, the drugs help to make more of these neurotransmitters available, which helps to lift a person's mood.
- **Tricyclics (TCAs)** are some of the oldest drugs used to treat depression as they have been around since the 1950s. They work by boosting the effect of serotonin and noradrenaline in the brain by preventing the reabsorption of these neurotransmitters into the neuron. This means that they have longer to act on the brain so their mood-enhancing effect lasts longer.

Link it up

The role of neurons and neurotransmitters is discussed in more detail in Topic 4 *The brain and neuropsychology*. Read ahead to develop your understanding of how these drugs work.

Key terms

Neurotransmitters: chemicals found within the nervous system that pass messages from one neuron to another across a synapse.

Noradrenaline: a type of neurotransmitter that is involved in mood and is released during times of stress.

Reuptake: the process by which neurons reabsorb neurotransmitters that they released.

Strengths and weaknesses of drug therapy as a treatment of depression

One strength of antidepressant drugs is that they can improve a patient's symptoms enough to make it easier for them to access other psychological therapies. If a patient has very severe symptoms, or they have suffered with their symptoms for a long time, the drugs can help to improve their mood, which should, in turn, improve their motivation. Once they are feeling better and are more motivated, they are more likely to benefit from another type of therapy such as CBT.

Key terms

Placebo: an inactive substance, or 'fake pill', used instead of an active substance. The person given a placebo will not know it is fake.

Relapse: a return of symptoms after treatment has been given.

The Royal College of Psychiatrists reports that 50 to 65 per cent of patients with moderate to severe symptoms of depression show improvements when given antidepressants. This is compared to only 25 to 30 per cent of patients with similar symptoms who were given a **placebo** (a 'fake pill'). This suggests that there is strong evidence that the drugs have a positive effect on the symptoms of patients.

One of the main problems with using drug therapy is that they can have unpleasant side effects for some patients. MAOIs can cause dangerous side effects if combined with certain foods, which means that patients taking these drugs have to follow a very specific diet to prevent such effects. Antidepressants in general can make patients feel drowsy, nauseous and dizzy, and they can cause disturbed sleep. These drugs can also cause diabetes and increase suicidal feelings. Some patients may find that taking the drugs decreases their quality of life rather than improves it because of the severity of some of the side effects. Tricyclics can be very dangerous if a patient takes too many, which is why they are not usually the first type of antidepressant offered to a patient.

Many people argue that while drugs do improve the symptoms of depression, they do not actually treat the disorder because they do not tackle the cause of the depression. Joanna Moncrieff and Irving Kirsch (2005) reported that while antidepressants are used more often, the long-term outcomes of depression treatment are actually becoming worse. Patients are becoming more likely to **relapse** after treatment for depression, despite the fact that the amount of antidepressants being prescribed is increasing. This suggests that the drugs are not treating the cause of the depression itself. A patient may begin to feel better and stop taking medication, but once the medication has left their body, they will no longer have the increased levels of neurotransmitters that make their mood improve. As a result, their symptoms may return, causing the relapse.

Addiction: symptoms, features, incidence and influence

What you will learn

- The symptoms and features of addiction that diagnose this as a mental health problem.
- How the number of people diagnosed with addiction has changed over time.
- How addiction can affect individuals and society in general.

Addiction is a psychological problem where people feel that they need to 'have' or 'do' something regularly to avoid negative feelings. Addiction can be to substances such as alcohol or tobacco (cigarettes). The International Classification of Diseases version 10 (ICD-10), where addiction is known as a 'dependence disorder', focuses on drugs (both legal and illegal drugs can be addictive). Some people can also have addictions to activities, including gambling, shopping or being on the internet.

People with addictions often have symptoms of **withdrawal** if they cannot have or do what they are addicted to. Withdrawal symptoms can make the person feel so bad that they might believe that they have to take or do the thing they are addicted to just to feel 'normal' again.

Symptoms of addiction

The ICD-10 refers to addiction as a dependence disorder because the body 'depends' on the substance in order to feel normal.

To be diagnosed as an addict, at least three of the symptoms in Figure 3.5 needs to be present at the same time for 1 month in total, or for repeated occasions over a year.

Symptoms of behavioural addiction to activities are very similar (Figure 3.6).

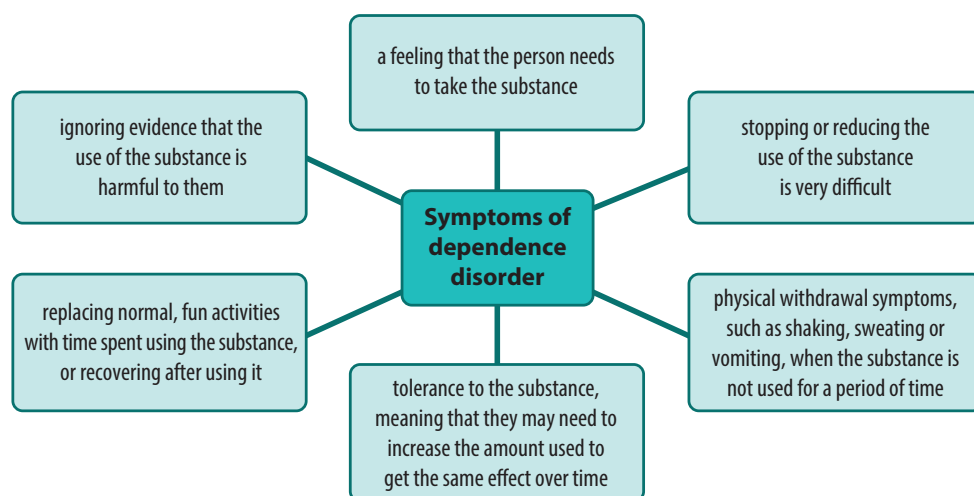


Figure 3.5 Symptoms of dependence disorder/addiction

Key terms

Addiction: a mental health problem that means people need a particular thing – a substance or an activity – in order to be able to go about their normal routine.

Withdrawal: a set of unpleasant physical or psychological symptoms someone gets when they are trying to quit or cannot satisfy their addiction.

Psychological problems – How would psychological problems affect you?

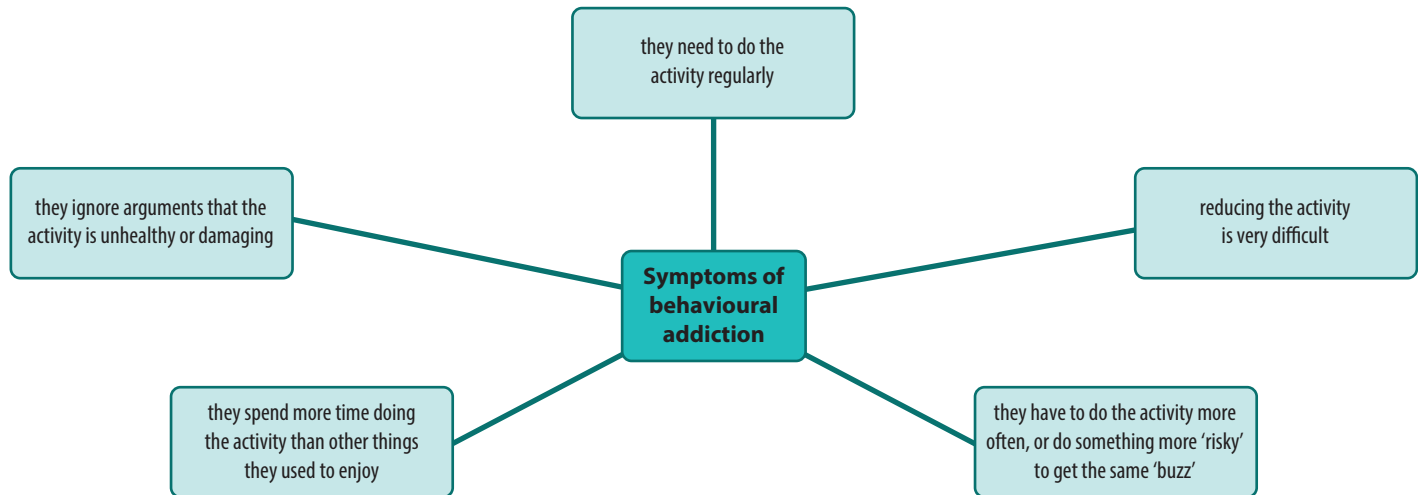


Figure 3.6 Symptoms of behavioural addiction

Features of addiction

Figures from Public Health England state that in 2014–15 there were 141,646 adults being treated for problems with substance misuse. Of these, most were treated for addiction to opiates (such as heroin or painkillers, including morphine), with the next highest group being treated for alcohol addiction. The number of people with addictions is difficult to estimate as many people may not realise they have an addiction, or may not seek help. There are also so many types of addiction that have been identified that it is difficult to collect all of the figures together. However, the NHS have estimated that about 2 million people in the UK are suffering from some kind of addiction, suggesting it is not a rare problem.

The ICD-10 does not currently recognise ‘internet addiction’ as a mental health problem in its own right. However, it would be recognised as a form of behavioural addiction characterised by the symptoms shown in Figure 3.6. According to a recent study, approximately 6 per cent of the world’s population have problematic internet use, which could be categorised as an addiction (Cheng and Yee-lam Li, 2014). They found that the highest rate of internet ‘addiction’ was seen in the Middle East (10.9 per cent of the population) and the lowest rate was seen in Northern and Western parts of Europe (2.6 per cent of the population). A 2014 survey in the UK found that 16 per cent of the 1300 18–24-year-old participants admitted to using the internet for 15 hours every

day. Many people have suggested that young adults may be particularly prone to reliance on, and possible addiction to, the internet.

How have incidences of addiction changed over time?

One key issue in assessing changes in the incidence of addiction over time is the change in the definition of ‘addiction’ itself. For example, addiction now includes internet addiction and addiction to video games (behavioural addictions), whereas in the past, ‘addiction’ was concerned with substance misuse. Although problematic use of drugs has been a social issue for a significant period of time, society’s relationships with drugs has also changed. For example, opiates (such as heroin) used to be prescribed for medical purposes. Nowadays, however, we might consider someone regularly using opiates or cocaine to be an addict.

Statistics suggest that the number of addictions in society is rising. Newspapers are often reporting stories about the rise in alcohol-related health problems, and ‘binge-drinking’ has been a social issue for many years. A report by the Centre for Social Justice (2006) suggested that many sources of addiction (for example, alcohol, heroin and cannabis) are becoming cheaper to access, which could increase the use in some groups of people. In 2014, research was carried out into the number of people who reported using illegal drugs. The results were reported in *The Guardian*: in 2008, 27 per cent of people who completed a survey said that



How many different types of addiction are there?

they had used an illegal substance; in 2014, 31 per cent of respondents said they had used illegal drugs. Even though there seems to have been a slight increase in reported drug use, most of the people who answered the survey said they no longer used drugs and did not feel they had ever had a 'problem' with drugs.

How does addiction affect individuals and society?

By 'doing' the thing they are addicted to, a person with the addiction may ignore their family and the things they regularly did, such as going to work or school. They may also spend money they would normally have used for other things, such as food or accommodation, on their addiction. This means their quality of life and their health could be affected because they are not able to invest in looking after themselves.

One effect of addiction on society is the impact on the workplace. For example, people with addictions may develop health problems as a result of substance misuse, or lack of self-care due to time spent on their addiction. This could mean that they need to take time away from work, which will result in costs for the company in covering the workload of the individual. A further impact on society is the cost of health care services provided to support those with addictions. Figures from the NHS claim that every year substance misuse costs the NHS £488 million, including the cost of rehabilitation programmes and treatment for associated health problems such as lung damage from smoking.

Some people with addictions will turn to criminal behaviour, including stealing and fraud, to get money to fund their addiction. As well as the emotional and physical costs for the victims, there is the cost of investigating these crimes. Figures presented by the NHS claim that drug-related crimes cost UK society £13.9 billion a year in total. This cost could include policing costs, the cost of trying a case in court, the cost of punishment and treatment programmes and the cost of supporting the victims of the crimes.

Psychological problems – How would psychological problems affect you?

Genetic explanation of addiction

What you will learn

- How the influence of genes can explain why people get addictions.
- The strengths and weaknesses of this explanation.

There is some evidence that addictions can run in families and might therefore have some genetic explanation. Lots of people do activities that could become addictive, such as drinking alcohol or gambling, but they do not get addicted to them. However, some people will very quickly show signs they are addicted to these activities after only doing them a few times. If addiction is genetic, that would explain why not everyone becomes addicted because some people do not have the genes that cause addiction.

Dorit Carmelli et al. (1992) found that in identical (monozygotic) twins, if one of them was a smoker there was a higher chance of the other one smoking than if the twins were not identical (dizygotic). Because identical twins share more genes than non-identical twins, this suggests that addiction to smoking could be genetic. Donald Goodwin et al. (1973) found that adopted children who had at least one biological parent with alcohol addiction were highly likely to show

signs of alcohol addiction themselves. This would suggest that they might have inherited a gene from their biological parent that makes them an addict. A study by Remi Cadoret et al. (1987) further supports this suggestion. Cadoret et al. found that adopted children who shared a biological link with someone with alcohol problems were more likely to have problems with alcohol themselves. They also found that if there was alcohol misuse in the adoptive family, then the adoptee had a greater risk of developing an addiction to alcohol. So, while there is a strong relationship between genes and alcoholism, there also appears to be an environmental influence (Figure 3.7).

One gene, the *DDR2* gene, has been shown to be related to developing addiction. Many different addictions, including gambling and alcoholism, have been linked to a variation of this gene, known as A1. This gene is thought to affect the way the brain reacts to pleasurable activities so that a person needs to do something more often to get a normal 'buzz' from it. Diana Martinez et al. (2004) found that a group of heavy users of cocaine were more likely to have a particular version of a dopamine receptor gene. This meant there were fewer D2 receptors in the brains of people with this form of the gene (D2 receptors are receptors for dopamine). This suggests that genetic variations can make some people more prone to developing cocaine addiction.

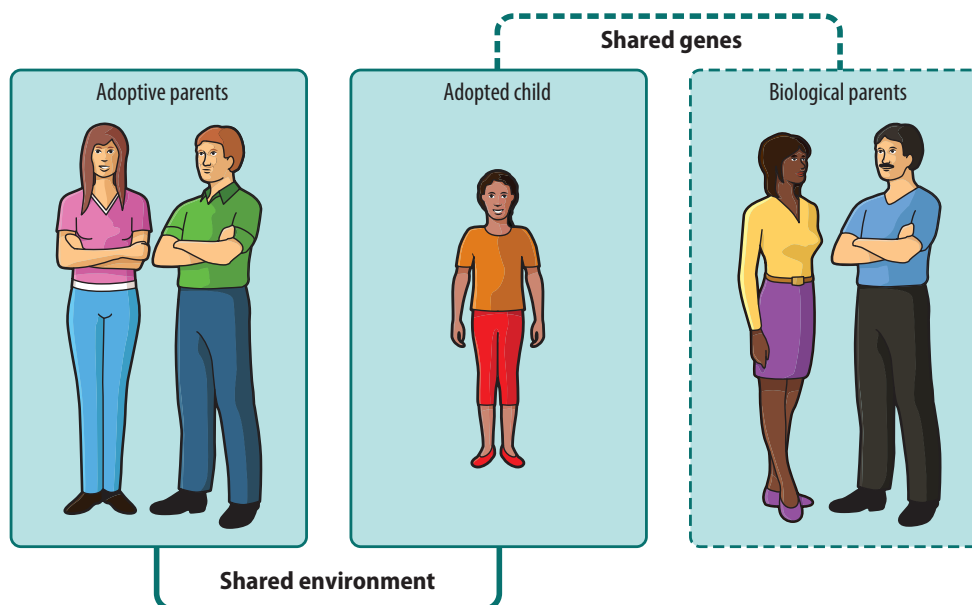


Figure 3.7 Adoption studies can separate out the effects of shared genes and shared environment on behaviour. Can you explain how evidence from adoption studies could support a genetic explanation for addiction?

Strengths and weaknesses of the genetic explanation

One strength is that there is a lot of scientific evidence to support the genetic explanation for addiction. Twin studies and adoption studies act as a control for possible factors that could explain addiction. The control makes it easier to be sure that the most likely explanation comes from the genes rather than other variables. Thus the research is more reliable.

Another strength of the genetic explanation is that it would explain why only some people are prone to becoming addicts. Some people seem naturally more likely to develop addictions, while others might take part in many potentially addictive behaviours but find it easy to stop and start. This could help us be more understanding of those in treatment for addiction because if it is in their genes, they cannot help the way they behave.

One weakness of the genetic explanation of addiction is that it is reductionist because it fails to take social factors into account. There is evidence that family members might share genes that would explain why addiction runs in families, but the results could also be explained by other shared factors. For example, many of the identical twins in Carmelli et al.'s (1992) study would have shared the same home environment, which might be a factor in their smoking addiction.

Another weakness is that research has not been able to find a single gene that explains where addiction comes from. This makes it difficult to pinpoint exactly what is causing the addiction. One of the genes that has been linked to addictions (DDR2 A1 gene) has also been linked to autism. Autism and addiction have very different symptoms and features, and so it is not clear how exactly the gene relates to addiction.

Link it up

For more information on receptors and how they work, see Topic 4 *The brain and neuropsychology*.

Develop it

Do some additional research on the internet to find out about other gene variations related to addiction.

Exam-style question

Amaya lives with her adopted parents, neither of whom drink alcohol. Recently she met her biological mother, who explained why she arranged for Amaya to be adopted when she was a baby. At the time, her mother was being treated for a serious addiction to alcohol that made looking after Amaya very difficult. Amaya has started to worry that she might be more likely to become an alcoholic because of this.

- Explain why Amaya might be worried about this, referring to the genetic explanation for addiction in your answer. **(2 marks)**
- Explain **one** strength and **one** weakness of the genetic explanation of addiction. **(4 marks)**

Exam tip

Make sure you stay focused on the genetic explanation of addiction in your answer to both parts of the question. You could, however, refer to another explanation when explaining a weakness of the genetic explanation of addiction.

Learning theory as an explanation of addiction

What you will learn

- How learning theory can be used to explain why people develop addictions.
- The strengths and weaknesses of this explanation.

Key terms

Learning theory: an explanation that believes behaviour is learned through associations and experiences.

Classical conditioning: learning by associations.

Operant conditioning: learning from the consequences of actions.

Social learning theory: behaviour is learned through observation and imitation of role models.

Reinforcement: an outcome resulting from behaviour that increases the chance of the behaviour being repeated or avoided in the future. The outcome may be the result of gaining something positive, or of something negative being removed.

Learning theories for addiction believe that the behaviour of addicts have been learned through some kind of experience they have had. There are three main learning theory explanations you can use to understand addiction:

classical conditioning, **operant conditioning** and **social learning theory**.

Classical conditioning and addiction

Classical conditioning states that behaviour is learned through associations, so when two or more things happen at around the same time our mind 'links' them together. These two things become automatically connected to one another so, in the future, when we experience one of these things, the other will automatically be triggered. For example, if you have ever been sick after eating a particular food, the next time you see, smell or eat that food you have probably experienced the feeling of being ill all over again.

This could explain why people first become addicted to something. If a substance or activity is associated with positive feelings in some way, the person learns to associate it with the positive feeling. So next time they want to feel good, they will want to take the substance or do the activity because they associate it with the required outcome.

Operant conditioning and addiction

Operant conditioning claims that behaviours are repeated when they lead to positive consequences. Any behaviour that is rewarded in some way makes us feel that this is the 'right thing' to do and increases the chance we will do it again. This positive consequence is a form of **reinforcement** that strengthens a behaviour and makes it more likely to be repeated. For example, if you are praised for helping out with chores at home, then you are more likely to do it again in the future. On the other hand, when there is a negative consequence to our behaviour, that behaviour is avoided. For example, if you were punished for coming home late, you would probably try to be on time in the future.

This could explain why people continue with behaviour they are addicted to even when they are told it is not good for them. If the thing they are addicted to makes them feel good, it reinforces the behaviour and makes them want to do it again. So, after a hard day at work, an alcoholic may pour a glass of wine because it will make them feel relaxed, or a gambling addict might feed £30 into a slot machine because the night before they won £60 doing the same thing. Because some addictions (particularly those to substances like alcohol or drugs) lead to negative physical symptoms when the person tries to stop, the person may continue with the addiction because they want to avoid feeling bad.

Link it up

Operant conditioning as an explanation of criminality is discussed in Topic 6 *Criminal psychology*.

Social learning theory and addiction

Social learning theory claims that behaviour is learned as a result of observing other people, especially those we consider to be role models, and modelling our behaviour on theirs. If someone looks up to a close family member, a friend or even a celebrity who has an addiction of some sort they may go on to copy this themselves. For example, if a child grows up with a parent who smokes, they may copy this when they are young by pretending to 'smoke' things like pens and pencils. When they get older and have the opportunity to try smoking real cigarettes, they might be more inclined to try it if they have been exposed to this behaviour at home for a long time.

Strengths and weaknesses of learning theory as an explanation of addiction

A strength of this explanation is that by assuming addictions are the result of learning, they are behaviours we can unlearn. This is an important factor in treating addiction because it means that any addiction should be treatable if the association of the consequences can be re-learned to avoid the problem behaviour.

Another strength of classical conditioning is that it helps to explain why previous addicts sometimes relapse (go back to their addiction) even years after they have stopped. A smoker who quit a long time ago may still find they get the urge to smoke when they are in a situation they used to associate with smoking cigarettes. For example, if they used to smoke more when stressed they might find that they have the urge to smoke when they feel stressed, even years later, because of the association between smoking and relaxing.

One weakness of the learning theory of addiction is that it ignores the role of biological factors that could influence addiction. However, the operant conditioning explanation does take into account that some biological factors influence addiction because the reinforcement for taking drugs is often the feeling you get from taking them, which is the result of how the drug affects your brain chemistry. There are pathways in the brain that can reward us internally when we do certain things by releasing certain 'feel good' chemicals into the brain. This suggests an interaction between the internal and external factors in addiction.

Another weakness is that conditioning theories do not explain why lots of people try drugs, alcohol and gambling but only a small number become addicted. If the cause was simply based on learning from associations and consequences, then anyone with experience of these should go on to develop an addiction. However, social learning theory may help explain this because if someone tries drugs, alcohol or gambling but a role model of theirs is not addicted to the substance or action then it would make sense that they would not continue with an addiction.

Link it up

For more detail on social learning theory as an explanation of behaviour, see Topic 6 *Criminal psychology*.

Link it up

Cognitive behavioural therapy as a treatment for addiction is discussed in the next section of this topic. Read ahead to find out more.

Sum it up

Many substances that are addictive act in the brain by either directly, or indirectly, increasing the amount of the neurotransmitter dopamine being transmitted in a certain pathway. The pathway, known as the 'reward pathway', is the part of your brain that is stimulated by pleasurable activities and associated with pleasant feelings. Taking drugs, such as alcohol and cocaine, will increase the level of activity in the reward pathway, which will result in the feeling of pleasure.

Cognitive behavioural therapy as a treatment for addiction

What you will learn

- How CBT is used to treat people with addictions.
- The strengths and weaknesses of using CBT to treat addiction.

Cognitive behavioural therapy was originally developed in the 1950s and 1960s through the work of Ellis and Beck in understanding and treating depression. The use of CBT for treating addiction began as a way of stopping alcoholics from drinking. Gradually, this has developed into a therapy that can be applied to treating many different forms of addiction, from different drug addictions to behavioural addictions such as using the internet. It aims to help people understand the triggers for their addictive behaviours and then learn how to control and manage these behaviours. When treating addicts, CBT occurs in two key stages: **functional analysis** followed by **skills training**.

Functional analysis

Functional analysis involves looking closely at the addict's behaviour and working out what makes them turn to their addiction. The therapist and the addict might look at what emotions make the addict turn to alcohol, for example, or who is around when the addict feels the urge to take heroin. By understanding the sources of the addiction, the addict, with the help of the therapist, can learn what places, people and/or feelings to avoid in order to stop doing the thing they are addicted to.

Skills training

Once they have completed a functional analysis, the therapist will help the patient to learn skills they can use to avoid engaging in the addictive behaviour. There are a wide variety of skills that can benefit each addict, but the skills will be developed

individually depending on the specific addiction, and the things that trigger it. Some examples of skills might be:

- how to cope with cravings – which might be useful for drug addicts or alcoholics
- assertiveness training – which might be useful if other people are often encouraging them to participate in the thing they are addicted to
- improving motivation – helping them to commit to the therapy and stop the addictive behaviour.

In between CBT sessions the patient will be asked to keep a diary of important events to record their progress as a form of homework. They can make a note of times they felt tempted, how they felt, what they did and how this made them feel.

This treatment for addiction can be combined with other therapies that help addicts deal with the physical effects of withdrawal from their addiction. This is particularly the case in substance abuse, such as heroin addiction, where CBT might be combined with a drug therapy (methadone) to reduce the symptoms of heroin withdrawal; in turn this helps the addict deal with their cravings. Nicotine gum is used in the same way to help smokers.

Key terms

Functional analysis: the first stage of CBT to treat addiction that identifies triggers.

Skills training: the second stage of CBT to treat addiction whereby addicts learn ways to control the patterns of behaviour that lead to their addiction.

Develop it

Find out how nicotine replacement therapy is used to help smokers reduce their cravings. For example, try to find out how nicotine gum helps to reduce the cravings felt by smokers.

Strengths and weaknesses of using CBT to treat addiction

Cognitive behavioural therapy has several strengths. One strength is that it aims to give the patient control to stop their own addictive behaviour. This means that they are building up skills to help stop their addiction and stay away from the behaviour in the future. As long as the addict is motivated to change their behaviour, they can reduce their own addiction using these skills.

CBT is supported by research evidence. For example, Kimberly Young's (2007) study found that CBT was effective for treating people with internet addiction both in the short term and up to 6 months after treatment ended. This suggests that it is an effective way of treating addiction, and can provide long-term treatment for those with addictions.

One problem with using CBT to treat addiction is that the addict has to be motivated to change their behaviour. One of the symptoms of addiction is that the addict finds stopping difficult, and they will refuse to face evidence that their addiction is harmful. This means that they might find committing to treatment for their addiction difficult. As CBT relies on the addict using the skills they learn, the therapy will only work if the patient wants it to.

Some research has suggested that even though addicts can learn better coping skills from CBT, this does not always mean that they will reduce the problem behaviour. For example, a study by Jon Morgenstern and Richard Longabaugh (2000) found that alcoholics often showed the ability to cope with their addiction after CBT, but did not always put these skills into practice and actually stop drinking.

Link it up

Young's (2007) study 'Cognitive behavior therapy with internet addicts' is discussed in the *Studies* section of this topic. Read ahead to find out more.

Exam-style question

A researcher is interested in whether cognitive behavioural therapy can be used to treat people with a gambling addiction. The participants took part in a series of 12 sessions of CBT over a 12-week period with one session per week. The results were compared to a group of gambling addicts who were receiving no treatment over the same 12 weeks. The researchers asked participants to rate their symptoms each week on a scale of 1–10 (1 = no symptoms of addiction; 10 = severe symptoms of addiction). The researchers compared the participants' ratings on weeks 1, 6 and 12. The results are shown in the table below.

	Week 1	Week 6	Week 12
CBT group	8.5	6.2	4.7
No treatment group	8.7	8.8	8.9

Table 3.2 The mean average ratings of participants' symptoms of addiction over a 12-week period

Explain what conclusions the researcher can make using the data presented in the table.

(2 marks)

Exam tip

First, think about what the aim of the study was in order to develop a suitable conclusion, and then use all of the data in the table to write your conclusion. The question is asking you to interpret what the data shows, so do not simply repeat the numbers from the table in your answer. For example you could start by saying 'In week 1, the CBT and no treatment group had very similar scores for their symptoms, however...' and then go on to discuss the change over the 12 weeks from the scores given.

Drug therapy as a treatment for addiction

What you will learn

- How drugs are used to treat addiction.
- The strengths and weaknesses of drugs as a treatment for addiction.

Patients can suffer from many different types of addiction and so treatment options can be a complex decision. Treatment will depend on the type of addiction they have and the severity of symptoms.

Key term

Detoxification: when an addict tries to stop taking the substance they are addicted to.

Drug addiction

Patients with drug addictions can often benefit from taking a form of medication to help them cope with the effects of **detoxification**. Many substances, like opiates (such as heroin), alcohol and nicotine (in cigarettes) can cause unpleasant side effects when patients stop using them. Medication can help to reduce these effects and help the patient to control their addiction.

Withdrawal

When a person stops using a substance that they have been addicted to, they can face physical symptoms of withdrawal as the substance leaves their system. For example, substance misusers might experience sweating, insomnia, shaking, lack of appetite, headaches and irritability when they stop using the substance. This can make detoxification a difficult process. Drugs can be given to patients to reduce these symptoms of withdrawal and reduce the chance of the patient relapsing and using the substance again.

Reducing cravings

Many patients who have addictions to substances will find that they crave the substance when they stop using it. This can be because their nervous system has become used to the effects of the substance and when they stop using it their body feels like it needs the substance again to 'feel normal'. Medication can be given to control these symptoms. For example, methadone can be offered to people addicted to opiates such as heroin, because methadone acts on the brain in a similar way to heroin, but is less dangerous. This can reduce the cravings that the addict feels from not using heroin. Smokers can use different forms of nicotine-replacement therapy such as chewing gum and patches. These help to reduce cravings for nicotine and prevent the person from starting to smoke again. Other drugs have been developed to treat alcoholics, such as naltrexone, which stops the craving for alcohol.

Treating other underlying mental health problems

Some patients with substance addiction also have other mental health problems, such as depression or anxiety. Drugs, such as antidepressants and anti-anxiety medication, can be offered to those with substance addictions. These drugs reduce the symptoms of problems that could cause a relapse in substance misuse.

Behavioural addiction

Although behavioural addictions, such as gambling, sex and internet use, are not typically treated using drug therapy, there is evidence that drugs can be effective for some patients.

Doctors are now prescribing naltrexone, a drug normally prescribed to treat those with severe alcohol addiction, to some patients with severe gambling addiction. There is some evidence that people with a severe gambling addiction experience some of the 'cravings' that we associate with substance addiction. Naltrexone can help to lessen these cravings and help to stop gambling addicts from relapsing when they stop gambling.

Other drug therapies that have been used to treat behavioural addictions are antidepressants such as SSRIs, which increase the amount of serotonin available in the brain. These seem to help patients control their urge to participate in the behaviour they are addicted to, although it is unclear exactly how or why SSRIs are effective. For example, recent research by Belinda Winder et al. (2014) has shown some evidence that treatment using SSRIs can help to reduce thoughts about sex in a group of sex offenders, which suggests that it could be a useful treatment for addiction to sexual activity. However, it is unclear how this therapy is effective, so research is still being conducted to see whether this could be a useful treatment in the future.

Strengths and weaknesses of drug therapy as a treatment for addiction

One strength is that there is research evidence supporting the effectiveness of drug therapies to treat addictions. For example, Suck Won Kim et al. (2001) presented evidence that 75 per cent of the gambling addicts they studied who were treated with naltrexone showed a significant improvement in their symptoms. This was compared to only 24 per cent of gambling addicts who had been treated with a placebo drug. This suggests that drug therapy can be effective in treating behavioural addictions such as gambling.

Another strength of using drugs to treat addiction is that they may help the patient access other types of

therapy that could help them control their addiction in the long-term, by dealing with some of the problematic short-term symptoms associated with stopping their addiction. If a person really wants to stop using a substance like heroin, but finds that the withdrawal symptoms of stopping the drug immediately are too much to cope with, they may quickly relapse. However, if they can control these symptoms using methadone and then access help in the form of CBT, counselling or support in getting a job, they may have more success at remaining substance free in the long-term as they would tackle other issues associated with their addiction.

One major weakness of the use of drugs to treat addiction is that the evidence supporting its effectiveness is very mixed. Addiction is a complex mental health problem, with many different possible 'addictions' being displayed by individuals. While evidence has shown that drugs can provide effective treatment, not all of the evidence agrees. For example, John Krystal et al. (2001) found that there was no significant difference in relapse rates over a 12 month period between alcoholic patients taking naltrexone and those taking a placebo drug. This suggests that naltrexone is not an effective treatment for all alcohol addiction patients, as their group showed no advantage compared to people taking a placebo.

Another weakness is that some argue that giving medication to patients who are already addicted to something, especially if the medication is another substance, could make their problems worse in the long-term as they may become dependent on the medication. For example, a patient with a heroin addiction who is treated using methadone could then become dependent on the methadone. At some point they will then need to be weaned off the methadone, and at this point the negative effects of withdrawal they have avoided will then begin to cause them problems. So while they are no longer using heroin, they may substitute their addiction for methadone, and when they have to stop taking the methadone their chance of relapse could increase when faced with the withdrawal symptoms.

Studies

Caspi et al. (2003) Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Lots of research evidence has found that stressful life events cause depression, but not everyone who experiences stressful life events becomes depressed. This study looks at whether a gene linked to the neurotransmitter serotonin, a brain chemical known to be involved in depression, makes some people more likely to become depressed after stressful life events than others.

A group of antidepressant drugs called SSRIs (selective serotonin reuptake inhibitors) help to increase the amount of serotonin available in the brain and reduce symptoms of depression. If low levels of serotonin cause depression, then maybe the genes that cause someone to have lower levels of serotonin than the rest of the population could explain why some people become depressed after stressful life events.

Aims

Avshalom Caspi et al. aimed to investigate why stressful life events seem to lead to depression in some people and not others. They then investigated whether stressful life events were more likely to lead to depression in people with a certain variation of the 5-HTT gene (a gene linked to the amount of serotonin available in the brain).

Procedure

Participants were members of the Dunedin Multidisciplinary Health and Development Study – a group of children who have been studied since birth.

In total, 847 members of this group took part. They were divided into three groups based on the version of the 5-HTT gene they had (Table 3.3).

	Version of the 5-HTT gene	Percentage of participants
Group 1	two copies of the <i>short</i> version of the gene	17%
Group 2	one copy of the <i>short</i> version and one copy of the <i>long</i> version of the gene	51%
Group 3	two copies of the <i>long</i> version of the gene	31%

Table 3.3 Groups of participants and their version of the 5-HTT gene

This was a **longitudinal study**, with each participant completing a questionnaire that measured the life events that occurred between their 21st and 26th birthdays. The events included problems with money, health or relationships. Another questionnaire assessed whether they had any symptoms of depression in the year before their 26th birthday, which gave the researchers quantitative data in the form of a 'depression score'.

Results

- Participants who were found to have at least one short version of the 5-HTT gene and who had been through stressful life events between the ages of 21 and 26 years old showed a significant increase in symptoms of depression after the event and up until they were 26 years old.
- Participants with a short version of the 5-HTT gene and who experienced stressful life events were more likely to be diagnosed with depression than participants with two long versions of the gene.

Key term

Longitudinal study: the same people are tested over a period of time to investigate changes.

- Those with a short version of the gene were more likely to develop suicidal thoughts after stressful life events than those with two long versions of the gene.
- Those with two short versions of the 5-HTT gene were most likely to report severe depressive symptoms if they had suffered a number of stressful life events, including a significantly higher report of suicidal thoughts or attempts if they had faced more than three stressful life events.

Conclusions

The evidence seems to suggest that there is an interaction between life events and genetic influences in causing depression. This suggests that both nature **and** nurture work together to increase the likelihood of a person developing depression. A person seems to need to have both a specific gene and stressful life events in order to become depressed.

Link it up

The nature and nurture debate is discussed in the *Issues and debates* section at the end of this topic. Read ahead to find out more.

Strengths and weaknesses of the study

A particular strength of this study is that there were 847 participants, which is a very large sample. This means that generalising the results from the study should be easier than if the sample had been very small.

Another strength is that the information from this study could be useful for doctors as it tells them that someone with depression could have different causes for their symptoms. Doctors should look at a variety of factors in their patients, including whether they have been through stressful events and whether they have the short version of the 5-HTT gene, to understand why they have become depressed. This might also help them to understand why some people become depressed after a life event, while others do. Realistically, however, doctors find it very difficult to assess all possible causes of a person's depression due to time and cost restraints.

One weakness of the study is that the researchers thought there was a chance that some people were naturally more likely to put themselves in situations where stressful life events might happen. The short version of the 5-HTT gene might be a natural factor that makes people prone to situations that are stressful. Therefore, the gene and life events may not be causing depression as such, but instead the person is in more stressful situations that could cause depression.

Another weakness is that the evidence from the questionnaires is self-report data, which might not be reliable. Some people might exaggerate their symptoms of depression, while others might not want to 'make a big deal' of them.

Sum it up

Caspi et al. (2003) found that patients who became depressed after stressful life events were more likely to have at least one short version of the gene that controls the level of serotonin available in the brain. This suggests that there is an interaction between nature and nurture when causing depressive symptoms. This study provides some value for society as it suggests that rather than simply looking for one cause of depression, we must consider that depression may have both biological and social causes. This also has implications for treatment. Some people may naturally be more prone to depression due to their genetic make-up, meaning that it needs to be considered how to treat patients who may be likely to suffer depression again in the future when faced with another stressful life event.

Apply it

Jeremy and Lucy are brother and sister. They have recently had to move house and change schools because their dad got a new job in a different town. Jeremy has adjusted really well but Lucy is feeling very down since the move.

Using your knowledge of the Caspi et al. study, explain how a difference in their genes could explain the difference in their reaction to their recent move.

Young (2007) Cognitive Behavior Therapy with Internet Addicts: Treatment Outcomes and Implications

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Internet addiction has been seen as a specific mental health problem only in recent years, which means that little is known about treatments for internet addiction. Kimberly Young had seen cognitive behavioural therapy being used effectively to treat many other types of addiction, and she wanted to see whether it would be possible to apply CBT as a treatment for internet addiction.

Aims

To investigate the effect of using CBT to treat a group of patients diagnosed with internet addiction and to see how problem behaviours improved over time both during the therapy and after therapy sessions had ended.

Develop it

Do some research and investigate exactly what symptoms are shown by patients diagnosed with internet addiction.

Procedure

A group of 114 participants were recruited from the Center for Online Addiction, a website dedicated to treating people with internet addiction in the USA. All the participants had completed the Internet Addiction Test (IAT) and were shown to have an addiction to using the internet. Any addicts who were shown to have other psychological problems were not chosen as participants.

All the participants were given a course of online CBT sessions. The first sessions (functional analysis) focused on finding out information about the background of the client (participant), when their symptoms had started,

what kind of symptoms they had as an individual and how serious those symptoms were. The next few sessions (skills training) helped the client to develop skills to treat the symptoms. For example, stopping using online apps that were causing a problem, and also using different strategies to reduce the amount of time spent online. The therapist also worked with the client to solve other 'problems' they were facing that could increase their internet use, such as problems at home, work or school.

Link it up

Look back at *Cognitive behavioural therapy as a treatment of addiction* to remind yourself about functional analysis and skills training.

Participants filled in a questionnaire during the 3rd, 8th and 12th online therapy session, and again 6 months after the treatment sessions had finished. The questionnaire, the 'Client Outcome Questionnaire', was designed to measure how well the CBT was working to treat the symptoms of their internet addiction. It included 12 questions where participants rated their behaviour or feelings on a 5-point **Likert-type scale**. Questions included 'rate your ability to control your computer use' and 'rate how your ability to engage in offline activities away from the computer has improved'. Each question was rated on a scale of 1 to 5 where 1 = not at all and 5 = extremely good.

Results

Slightly more males (58 per cent) than females (42 per cent) were included in the study. Many of the participants (61 per cent) were educated to university level. There were some differences in what online apps participants were addicted to. For example, 30 per cent of males were addicted to online pornography, while 30 per cent of females were addicted to online chat rooms. Almost all participants (96 per cent) said that the biggest problem caused by their addiction was the time taken up by using online apps.

Key term

Likert-type scale: a scale where a person can rate their level of agreement to a statement.

One aspect measured by the questionnaire was the clients' attitude towards the CBT sessions, including the relationship the client felt towards their therapist. Over the 12 sessions of CBT, the average rating of the quality of the CBT sessions improved.

Goal	Session 3	Session 8	Session 12	6 months after
Motivation to stop using online apps	4.22	3.96	4.54	4.36
Time management in using online apps	3.95	4.06	4.33	4.22
Relationship function	2.95	3.66	4.42	3.99
Sexual function	2.15	2.99	3.26	3.16
Engaging in offline activities	2.67	4.46	4.66	4.87
Staying off problem apps	3.45	4.28	4.55	4.35

Table 3.4 The mean average rating of each outcome goal from the questionnaire over the course of the CBT sessions – an increase in score indicates an improvement of symptoms

This data (Table 3.4) suggests that for many of the therapy goals there was some improvement over the 12 weeks of therapy, and there was no significant drop in ratings of these goals 6 months after therapy ended.

Conclusion

The results of this study seem to suggest that CBT can be an effective treatment for internet addiction because clients reported an increase in their ability to control problem behaviours. It also seems to give long-term benefits because after 6 months many of the clients still reported similar ratings of control.

Strengths and weaknesses of the study

One strength of this study is that it tells us that online sessions of CBT might be useful for treating internet addiction. This is a useful way to encourage people

to access treatment for addiction. Some people might be embarrassed to see a therapist face to face or find it difficult to find time to go to therapy sessions. Using online CBT might encourage more people to access treatment for addictions if other types of therapy are not appropriate.

Another strength is that using the same questions and rating scale across all of the measurements of the goals means that the data at session 3, 8, 12 and after 6 months was reliable. Each person was assessing their own behaviours in exactly the same way each time so it is consistent and standardised.

One weakness of the study is that the clients filled in questionnaires about their own feelings and behaviour, which might not be accurate. People might lie on a questionnaire when they know they are supposed to be getting better (stopping using the internet). This means that data might not be valid as a picture of how their behaviour has changed during treatment.

Another weakness of this study is that different types of internet addiction were identified and it is not clear whether all types achieved the same effects from treatment. Young identified online gambling addicts, those addicted to online pornography and some addicted to internet chat rooms among others. However, the results only show the overall treatment outcomes for each goal with no breakdown for the type of addiction.

Sum it up

Young (2007) found that CBT was a useful treatment for people diagnosed with internet addiction. Over the course of the treatment the symptoms of addiction seemed to improve, and even 6 months later the symptoms were still better than they were at the start. If the patients are addicted to using the internet already, online CBT would seem a useful method of getting them to access treatment. However, asking an internet addict to use an online application as a form of treatment could contribute to their addictive behaviour.

Issues and debates

Nature and nurture debate

What you will learn

- The nature and nurture debate, including key terms.
- Concepts, theories and research drawn from mental health problems to explain the debate.

In psychology, there is a debate about what has the biggest effect on who you are – nature or nurture. It is really a debate about whether our behaviour is the result of our biological make-up (nature) or of learning from our environment (nurture). The debate relates to all behaviour – everything from whether you will become a criminal, to how intelligent you are going to be. Some psychologists think that nature has a bigger influence, others claim that nurture is the more influential factor and others feel that both nature and nurture are equally important as they interact to influence development (Figure 3.8).

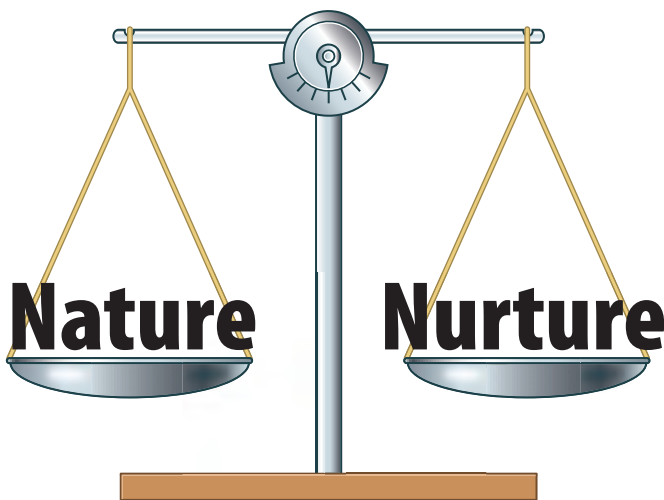


Figure 3.8 Do you think it is nature or nurture that has had the most influence over who you are?

Nature

Nature refers to the biological factors that can influence a person's behaviour, and these are generally in place even before we are born. One example is the genes we inherit from our parents. These genes determine how our body will develop, and we often accept that we will all be physically different because of the different genes we have. For example, the genes we inherit will affect our hair colour, eye colour and height. However, some psychologists also think that behavioural characteristics are hard-wired into us by our genes. Some people believe that, for example, being a criminal, building relationships and developing mental health problems could all be explained by looking at our genes.

Nurture

Nurture refers to the environmental factors that can influence a person's behaviour, mostly after they are born. One example is the influence that watching family members has on a person's behaviour. Those who look at the influence of nurture on behaviour tend to think that we are born as a 'blank slate' and that all our experiences throughout life then get written into us. The process of writing onto the blank slate is what influences human behaviour, so it is our experiences that influence our behaviour. One example might be children copying violent behaviour they have seen on television, or learning to speak by copying the words their parents say.

The nature and nurture debate and mental health problems

The debate over what influences behaviour most – nature or nurture – has been a big issue in the study of psychological problems because it can have an impact on how we should treat those with mental health problems.

There are explanations of mental health problems that claim genes have a strong influence, supporting the nature side of the debate. For example, Caspi et al. (2003) found evidence that having a specific version of a gene that affects the amount of serotonin available in the nervous system (5-HTT) could influence whether someone was likely to develop depression after a stressful life event. If we assume that becoming depressed or developing an addiction is due to genetics, we can explain why some people do not develop these psychological problems – because we inherit different genes. If these mental health problems are influenced by genes, then we have to consider that patients will find changing these behaviours very difficult – we cannot change a person's genetic make-up. So, for people with the short version of the 5-HTT gene that predisposes them to depression after a life event (Caspi et al., 2003), the depression might be more likely to return even after treatment because they still have that version of the gene. This means that any future life event could trigger a relapse.

There are also explanations for psychological problems that support the nurture side of the debate, such as the cognitive explanation of depression and learning theory as an explanation of addiction. Both of these explanations assume that the psychological problems are learned as a result of events that happen in a person's environment. If we assume that mental health problems like depression and addiction have been learned, other ways of behaving can be learned to replace them. This could form the

basis of treatment. This would explain why cognitive behavioural therapy can be used to treat both depression and addiction, by training patients to think differently and then change the way they behave. The fact that this therapy is so effective for treating both of these types of psychological problems would support the claim they are caused by nurture and not nature.

Other explanations for mental health problems claim that there is an interaction between nature and nurture factors that causes symptoms. Caspi et al. (2003) found that a combination of the short version of the 5-HTT gene and a stressful life event increased the risk of developing depression. The genes make some people more prone to developing a mental health problem, and then a stressful event from the environment will trigger the symptoms.

Psychology in action

Television shows have often been criticised in the past for the way people with mental health problems are portrayed. Storylines about mental health issues often focused on the negative impact of symptoms and failed to show what caused the problems and how they could effectively be treated. For example, people with depression would be shown in crisis and struggling to cope, and those with addiction might be shown living in poverty and heavily addicted to drugs. But this is only part of the story about mental illness. In 2014, a charity called Time to Change worked with television companies to change this so that mental health problems were portrayed in a more realistic and positive way. This helps to increase awareness of the issues and stop people being afraid to admit when they are suffering from mental health problems. The research by psychologists has increased our understanding of the issues surrounding mental health problems and has allowed work to be done to change the way society views mental health issues.



Topic 4 | **The brain and neuropsychology – How does your brain affect you?**

Exploring the topic

Your brain is a very important organ in your body. It is often thought of as the 'control centre' of your body as almost all of your behaviour is controlled from the brain, which sends messages around the rest of the body.

Neuropsychology is an area of psychology that aims to learn more about the brain and how it works. This topic will explore the different parts of your brain and what they do. We will also look at what happens when the brain is damaged or does not work in the same way as everyone else's. You will explore some of the ways that we can study the brain and show how studying the brain has changed over time.

Your learning

In this topic you will learn about:

- the structure and function of the brain
- the lateralisation of function in the hemispheres
- the role of the central nervous system and how neurons and synapses interact
- the impact of neurological damage on cognitions and behaviour
- neuropsychological studies by Damasio et al. (1994) and Sperry (1968)
- issues and debates about how the study of psychology has changed over time.

Getting started

The brain is a very delicate organ made up of huge networks of cells called neurons. Like any internal organ, the brain is soft and could easily be damaged, but because of how important it is to us our bodies are designed to protect it carefully. There are several layers of tissue inside your skull to keep it safe. The brain is also suspended inside a fluid that helps to cushion it from any bumps to your head.

Even with all this padding, the brain can get damaged. For example, later in the chapter we will be looking at the case of Phineas Gage. There have also been recent cases of footballers, boxers and rugby players who claim they have suffered brain damage as a result of repeated knocks to the head during matches.

Find some examples of cases of brain damage by doing some research. Look at what caused the damage, where the damage was and how the person changed after the injury.



Many contact sports can result in knocks to the head, which in extreme cases may result in concussion. Recent research has linked multiple concussion injuries to brain injury. Find out what concussion is and what the research has said about the risks to the brain.

The structure and function of the brain

What you will learn

- The structure of the human brain.
- The location of the temporal, occipital, frontal and parietal lobes of the brain, and their functions.
- The location and function of the cerebellum.

Key terms

Brain: the organ in your head made up of nerves that processes information and controls behaviour.

Hemisphere: half of the brain; if we imagine a person facing forward and then look down on the brain from the top, the right hemisphere is on the right side of the brain, while the left hemisphere is on the left.

Cerebrum: the largest part of the brain where higher processing happens; it includes the cortex.

Cortex: the outer layer of the brain.

Spinal cord: a pathway of nerves inside the spine, which connects the brain to the rest of the body through the peripheral nervous system.

Brainstem: the part of the brain that connects the spinal cord to the upper brain.

Reflexes: actions that are automatic and do not require conscious thought.

Frontal lobe: the area at the front of the brain responsible for decision-making and impulse control.

The structure of the human brain

The human **brain** weighs approximately 1.4 kg and is one of the biggest in the animal kingdom in comparison to the size of the rest of the body. It is a very complex organ that has to control a lot of different functions and behaviours, from making sure you keep breathing, to helping you to make sense of the world around you.

In order to 'fit in' all of these complex functions, the brain is very carefully structured to make the most of the space available inside your head. It is divided into two halves, one on the left and one on the right, known as **hemispheres**. The upper part of the brain is called the **cerebrum** and this has an outer **cortex**. The cortex is like a 'shell' around the outside that has a lot of folds in it to increase its surface area. The 'bumps' on the surface are known as gyri (or 'a gyrus' – singular), and the 'creases' are known as sulci (or 'a sulcus' – singular). The large surface area allows the human brain to have more nerve cells and therefore allows it to control more functions. If you study the surface of another animal's brain, such as a rat's, you will notice that it is much smoother than the human brain. Animals that have fewer behavioural functions than humans need less surface area in the brain.

The brain is able to communicate with the rest of the body through the **spinal cord**. Information passes between the brain and the spinal cord through the **brainstem**, which also controls **reflexes**.

The functions of the brain

The key areas of the brain (see Figure 4.1) perform different functions:

- The **frontal lobe** has an important role in decision-making and impulse control. This part of the brain also helps control problem-solving skills, as well as helping us to concentrate and pay attention to different activities. Towards the back of the frontal lobe is the motor cortex. This is a large area just in front of the central sulcus (the crease that separates the

Link it up

The peripheral nervous system is explored later in *The role of the central nervous system* section.

frontal lobe from the parietal lobe). The motor cortex plays a key role in the voluntary movements of the human body, which are the ones we have to think about before we do them. For example, if we want to kick a ball, the motor cortex helps to control this movement.

- The **temporal lobe** helps us with hearing and understanding sounds, understanding speech and creating speech. In the temporal lobe, there are important areas involved in both producing and processing sound-based information. This is why the temporal lobes are said to contain the auditory cortex (it controls hearing). There are also areas in the temporal lobe that help to control memory functions.
- The **parietal lobe** has a big part to play in our ability to understand the world around us (perception). For example, it gives us the ability to recognise faces. Perception of faces requires us to know that the 'object' we see is a face, and then work out whether the face belongs to someone that we already know so that we can understand who they are. There is also a large section at the front of the parietal lobe, just behind the central sulcus, that is responsible for our sense of touch. This part of the parietal lobe is known as the somatosensory cortex.
- The **occipital lobe** mainly deals with our ability to see. It helps us to process visual information from our eyes, and also helps to make sense of this information so we understand what we are seeing. This lobe is often called the visual cortex because its main job is controlling all things related to processing visual information.
- The **cerebellum** plays a vital role in movement, coordination and balance (our motor skills). This part of the brain takes information from the different senses, our spinal cord and other parts of the brain and combines them to coordinate behaviour. For example, if we are running and see an object in our way, the cerebellum combines this information and sends a message back to the body, telling it to move to avoid the object. The message is sent via the spinal cord telling us to change direction while helping us keep our balance so we do not fall as we dodge the object in our way.

New research is questioning the idea that specific areas of the brain have specific functions. The use of modern scanning techniques suggests that functionality is more dispersed than previously believed.

Apply it

Understanding the structure (how it is made up) and function (what it does) of the different parts of the human brain is really important in being able to predict what will happen to people if their brain is damaged. Jenna was involved in a car accident and suffered damage to her parietal lobes. What kind of problems might be expected in a patient like Jenna? Sayed fell from a horse and landed on the back of his head. Although he was wearing a helmet the doctors have discovered swelling in his occipital lobe. What kind of problems might Sayed expect to suffer?

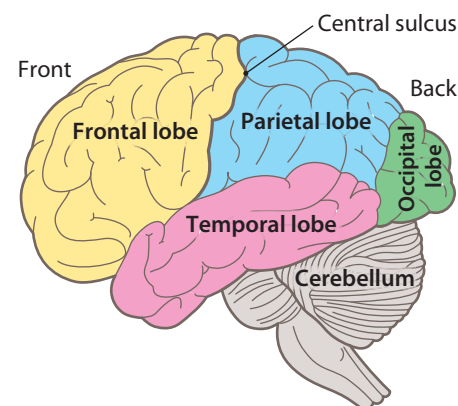


Figure 4.1 The cortex of the brain is divided into five key areas: four lobes across the cortex (frontal, temporal, parietal and occipital) and the cerebellum, located towards the bottom of the brain

Link it up

Early brain development, including the development of the cerebellum, is explained in Topic 1 *Development*.

Key terms

Temporal lobe: the area on the side of the brain that controls hearing and memory.

Parietal lobe: the area at the top of the brain that plays an important role in perception and sensations of touch.

Occipital lobe: the area at the back of the brain that controls vision.

Cerebellum: an area of the brain near to the brainstem that controls motor movements.

Lateralisation of function in the hemispheres

What you will learn

- How the two hemispheres of the brain have asymmetrical (different) functions.
- The role of the left and right hemispheres.
- The role of the corpus callosum.
- The strengths and weaknesses of lateralisation as an explanation of sex differences between males and females.

Key terms

Lateralisation of function:

the different jobs that are done by each half of the brain; each hemisphere will have different specialist roles that it performs.

Asymmetrical: the two hemispheres of the brain are not equal in terms of what they do; each hemisphere controls different functions, or plays a larger or smaller role in a particular behaviour.

Corpus callosum: a thick bundle of nerve fibres connecting the two hemispheres of the brain so they can communicate with each other.

Lateralisation of function in the brain means that each hemisphere of the brain has different jobs or roles. Some behaviours are controlled more from the left side than the right side, while others are controlled more from the right than the left.

Asymmetrical function

The two hemispheres of the brain are not exactly the same, both in terms of their structure and their functions. The difference between the two sides of the brain makes it **asymmetrical** because, although they may look very similar, they are not mirror images of one another.

One interesting thing about how the brain works is that each side of the brain appears to control the functions on the opposite side of the body. So, the right side of the brain controls functions on the left side of the body, while the left side of the brain controls the right side of the body. One example of this is in hand control – the right hemisphere is in control of the left hand, while the left hemisphere controls the right hand. To help the two hemispheres work together, a thick layer of nerve fibres (the **corpus callosum**) connects the right and left hemispheres. The corpus callosum allows the two sides of the brain to communicate with each other so that the whole brain can work as one complete organ. In this way, the two hemispheres retain their own roles while working together to control behaviour in the whole body.

Try it

One hemisphere in your brain tends to be more dominant than the other. Some people think that you can tell brain dominance by looking at the hand you write with, so right-handers might have a dominant left hemisphere. There are also some online tests you can use to tell you which hemisphere of your brain might be more dominant. Search online for a test and have a go. Do you agree with what it says about you?

Link it up

Roger Sperry (1968) studied the effects of splitting the corpus callosum in two. Read ahead to find out more about his research and what happened.

The role of the left and right hemispheres

Due to the complexity of the brain, it is difficult to pinpoint exactly what functions are controlled in each separate area of the brain. There has been a lot of research into what the right and left hemispheres do, but we still know very little about the functions of each side. We do know that the right and left hemispheres are linked to the ear on the opposite side of the head. So auditory information from the right ear will be processed by the left hemisphere, and so on. The information is easily shared by the whole brain through the corpus callosum.

The left hemisphere plays a big role in the processing of language. An area in the left hemisphere, known as **Broca's area**, controls the production of speech; if it is damaged, people might find it difficult to talk. Broca's area is linked to the control of the nerve cells in the face that help us to speak, and also to the general processing of language-based information. Other areas of the left hemisphere are dedicated to the control of our ability to write and to understand language. Damaging these areas – for example, after suffering a stroke in the left hemisphere – causes problems in our ability to do these things.

The right hemisphere has a large role to play in our **spatial awareness**. There are also parts of the right hemisphere that control our ability to recognise and perceive faces. The right hemisphere is often seen as being more creative. It is involved in the processing of music that we hear, and also in making sense of visual information that we see.

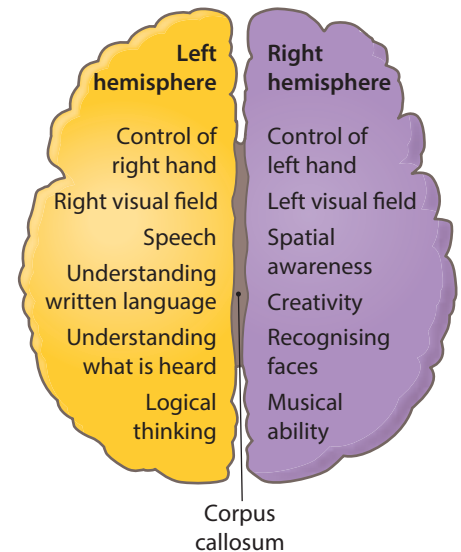


Figure 4.2 If each hemisphere controls different functions, what do you think would happen if we stopped them 'talking' to each other via the corpus callosum?

Apply it

Shaun has suffered damage to his brain following a biking accident that caused him to bang his head badly. The doctor says his brain scan shows that there is swelling in Broca's area in his left hemisphere and Shaun should expect some short-term problems until the swelling goes down. From your understanding of the functions of Broca's area, what effects might Shaun's doctor advise him to expect?

Key terms

Broca's area: a part of the left hemisphere of the brain that controls speech production.

Spatial awareness: the ability to negotiate space and navigate our way around our environment.

Link it up

Broca's area is discussed further in Topic 10 *Language, thought and communication*.

The brain and neuropsychology – how does your brain affect you?

Develop it

Living without a corpus callosum is possible, as we will see later in this chapter when we look at Sperry's (1968) research with 'split-brain' patients. Some people are born without a corpus callosum (a disorder known as *agenesis of the corpus callosum*) but many do not even realise this part of their brain is missing until later in life. People without a working corpus callosum can have a variety of different behavioural symptoms, but it does not affect everyone in the same way. Do some research to find out what life might be like for someone born without a corpus callosum.

Apply it

Max and Anita have twins – a boy, Jasper, and a girl, Jasmine. When the twins started preschool, their teacher commented that Jasper really enjoyed building models with blocks and bricks, while Jasmine liked listening to stories, talking to her friends and making up games to play.

Based on traditional views of brain lateralisation, how could you explain the difference in the twins' behaviour at preschool?

The role of the corpus callosum

The corpus callosum is a thick band of nerve fibres that connects the left and right hemispheres together. It allows messages to be passed from the left hemisphere to the right hemisphere and *vice versa*. This makes it easier for the brain to pass messages between the different areas of the brain, making connections between different types of information. For example, if you hear something spoken into your left ear, this information passes to the right hemisphere of the brain. The information can then be passed to the left hemisphere to be decoded so that the brain understands what was said. From here, the information can then be passed to the right hand for the person to write down what they have heard.

How can we explain differences between males and females?

You do not need to be a psychologist to realise that males and females are different. Obviously there are physical differences between them, but the behaviour of males and females is also different. In your life you have probably noticed things that your male friends like to do that are not the same as what your female friends often do. Television programmes and magazines, for example, often highlight things females supposedly like to do, such as to gossip, while males are supposedly better at doing things like parking cars. These differences are interesting to psychologists because they can tell us something about how the physical differences between males and females might influence their behaviour. One of these differences might be in how the brains of males and females develop.

Sex differences in brain lateralisation

Traditionally it has been thought that males and females have brains that work differently, which would account for the many differences between the sexes. It was always thought that females were better at language skills (left-brain tasks), for example working out which words have the same meaning. Males, on the other hand, were felt to be better at spatial skills (right-brain tasks), such as imagining what a shape would look like if it was shown from a different angle. There was even some evidence that females may have a thicker corpus callosum meaning they may use both sides of their brain for

Try it

Why not carry out a practical task to test whether you find any differences between the abilities of boys and girls in your class? Ask members of your class to solve an anagram (a language-based task) and a maze (a spatial task) and time them as they do these tasks. Once you have your data, work out the average speed of the boys and then the girls for each task to see if there is any difference. Based on the information here, we might expect girls to be faster at solving the anagram, while the boys would be faster at the maze task. What does your data show? Can you identify any problems with your own research?

some tasks. Males, on the other hand, tend to show dominance for one hemisphere for the same tasks with more activity in one hemisphere than the other, rather than an equal spread of activity.

Strengths and weaknesses of lateralisation as an explanation of sex differences between males and females

Some studies have provided evidence to show that male and female brains may work differently because of how the roles of different areas of the cortex are organised. A study by Harasty et al. (1997) suggested that parts of the brain that process and produce language are slightly bigger in females compared to males. This would explain why there is a view that females are better at tasks that use language skills. Another study by Rilea et al. (2005) found that males were better at some spatial tasks, especially those that use a lot of activity in the right hemisphere.

There is plenty of evidence to support differences in the brains of males and females. Much of this evidence uses scientific methods such as brain scans and laboratory experiments. These methods allow the research to be well controlled, and help to prevent the interference of extraneous variables. This strengthens the explanation as the research evidence is scientific and so the explanation, developed from this evidence, can also be seen as such.

While there is some evidence that the right and left hemispheres of male and female brains may work slightly differently, the research has weaknesses. In the Rilea et al. (2005) study, for example, males did not always do better than females on the spatial tasks. Further to this, there were spatial tasks used in the study that did not use a lot of 'right-brain' activity. So differences in how males and females use the right hemisphere for spatial tasks cannot account for all differences in performance.

A study published by Sommer et al. (2004) suggested that there was no strong evidence that females used both hemispheres for language tasks, meaning that this is not a good explanation for girls being better at language skills than boys.

Develop it

For many years GCSE results have shown differences in the results of boys and girls in different subjects. Girls have overtaken boys in English, while boys often outperform girls in science. Likewise, girls are more likely to study languages, while boys are more likely to study science and maths. Find out what the current statistics are.

Why do *you* think boys and girls have different skills, like those shown in these subjects?

The brain and neuropsychology – how does your brain affect you?

The role of the central nervous system

What you will learn

- The role of the central nervous system.
- How neurotransmitters (chemicals) pass messages around the body.
- How synapses work to pass on the messages.
- How neurons and synapses interact.

The **central nervous system (CNS)** is made up of the brain and the spinal cord. The CNS helps the brain and body communicate with one another by passing messages backwards and forwards between them. The sensory nerves in the body (for example, those located in the skin, muscles and organs that take information into the nervous system) send messages to the brain via the spinal cord. The brain processes the information and then sends messages to the body down the spinal cord to make the body do something. The spinal cord can activate the **peripheral nervous system (PNS)**, which makes the body do the actions the brain is telling it to do (Figure 4.3). Although it sounds like a long process of passing messages, the information can be passed around in the nervous system in a fraction of a second.

The function of neurotransmitters

Neurotransmitters are chemicals that are released from **neurons** (also called nerve cells) to help them to pass messages from one cell to another. There are different types of neurotransmitters that all have different jobs inside the nervous system. Some of these are listed in Table 4.1.

Key terms

Central nervous system (CNS): the brain and spinal cord, which relays messages from the brain to the rest of the body to instruct it what to do.

Peripheral nervous system (PNS): the system of nerves that connect the central nervous system (mainly the spinal cord) to the skin, muscles and organs in the body.

Neurotransmitters: chemicals found within the nervous system that pass messages from one neuron to another across a synapse.

Neuron: a nerve cell that transmits information.

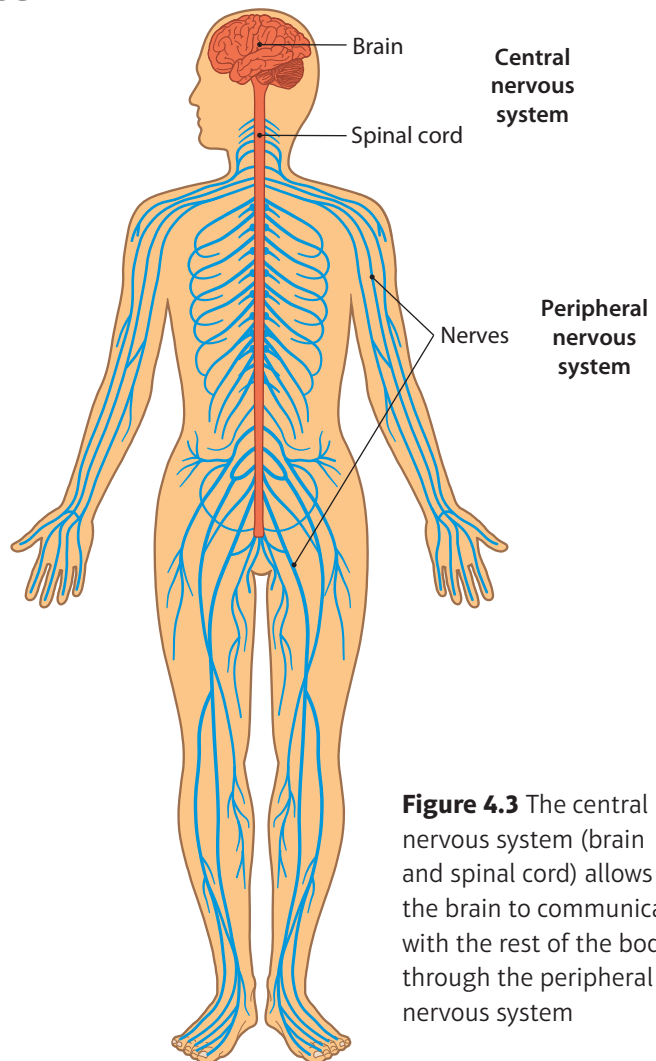


Figure 4.3 The central nervous system (brain and spinal cord) allows the brain to communicate with the rest of the body through the peripheral nervous system

Neurotransmitter	Example of what it does
Dopamine	Plays a role in attention and learning. Not enough dopamine can make it difficult to concentrate on tasks.
Serotonin	Plays a role in mood. Too little serotonin can make people feel depressed.
GABA (gamma-aminobutyric acid)	Plays a role in calming us down. When we feel stressed we produce GABA to relax us.

Table 4.1 Neurotransmitters and their roles

Neurotransmitters are released when a nerve impulse reaches the end of a nerve fibre. The neurotransmitter is then picked up by another neuron to receive the message and possibly continue the nerve impulse.

Synaptic functioning

Messages are passed throughout the nervous system, from one neuron to the next, by a process called **synaptic transmission** (Figure 4.4).

Synapses are tiny gaps between neurons that allow chemical messages to pass between them. An electrical impulse is triggered inside the cell body of a neuron; the neuron then passes a small impulse along the **axon** towards the end of the nerve fibre. At the end of the nerve fibre is a structure called the **terminal button**, which is filled with tiny sacs called **vesicles** containing the neurotransmitters (chemical molecules). When the nerve impulse reaches the terminal button, the vesicles release the neurotransmitter molecules into the synapse. These molecules are then 'grabbed' by the **receptors** on the next neuron to pass the message impulse on.

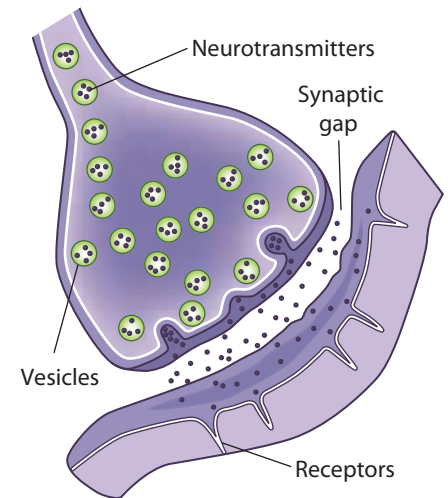


Figure 4.4 Neurons pass chemical messages across a synapse – the gap between two neurons

Key terms

Synaptic transmission: the process by which neurotransmitters are released by a neuron, move across the synaptic gap and are then taken up by another neuron.

Synapse: a gap between two neurons that allows messages, in the form of neurotransmitters, to pass from one cell to another.

Axon: the long structure that connects the cell body of a neuron to the terminal button at the end of the cell.

Terminal button: the end of a neuron.

Vesicles: small sacs containing neurotransmitter (chemical) molecules.

Receptors: special sites on neurons that are designed to absorb neurotransmitter molecules.

Link it up

Neural connections are discussed in Topic 1 *Development* when looking at how the brain develops.

Exam-style question

Jana has been given some medication to treat her depression. The drug she has been given will affect her central nervous system by influencing the amount of the neurotransmitter serotonin that is available.

Explain the role of neurotransmitters, making sure you refer to Jana in your answer. **(2 marks)**

Exam tip

Some exam questions will have information before the actual question you need to answer. Make sure you read everything on your paper clearly before you answer the question. There are usually hints given, or information you have to use in your answer. For this question, you should refer to serotonin as a neurotransmitter, and more of it being available, and also relate this to Jana's mood being happier.

The brain and neuropsychology – how does your brain affect you?

The impact of neurological damage

What you will learn

- How your thoughts and behaviour can be affected by damage to your brain.
- Signs and symptoms of two disorders linked to brain damage known as ‘visual agnosia’ and ‘prosopagnosia’.
- How damage in the pre-frontal cortex of the brain might affect a person’s behaviour.

Neurological damage refers to any kind of damage to parts of the nervous system. In this section, we will be looking at the effects of brain damage on a person’s thoughts and behaviour. The brain is an important part of our central nervous system; if it is damaged, the messages that would normally be passed around in the nervous system might be interrupted. It could be that a large part of the brain is damaged, meaning that the neurons that would usually have a specific function are no longer working. Alternatively, the damage could be on a smaller scale, where a few neurons in a larger network of neurons are damaged and are not working properly. Either way, the normal functions of the brain might not be possible. This can have a significant impact on how a person thinks or behaves.

Two examples of how the brain’s ability to process information is affected by brain damage are **visual agnosia** and **prosopagnosia**. Damage to the **pre-frontal cortex** in the brain also affects behaviour.

Visual agnosia

Agnosia is a problem in the way the brain processes sensory information, which means that the brain is unable to make sense of the information. This results in a person not being able to recognise something that is presented to them. Visual agnosia is a disorder in which a person can see perfectly well but they cannot understand what they are seeing. For example, they could be shown a picture of a kettle, but they

would not be able to say that it is a kettle. This can be the result of damage to the parietal lobe because it is a disorder of perception.

Link it up

Look back to the beginning of this topic, to *The structure and function of the brain*, to remind yourself about the key areas of the brain and the functions they perform.

Symptoms of visual agnosia

With visual agnosia, the information sent from the eyes to the brain cannot be understood, meaning that the person cannot identify the things they can see. It is important to remember that in visual agnosia the person can see the object in front of them perfectly well, it is their brain that cannot make sense of this information.

Visual agnosia can cause many symptoms depending on the type of visual information the brain cannot understand:

- Patients might not be able to recognise the colour of an object.
- Patients might not be able to recognise objects and name them.
- Patients might not be able to recognise places they are familiar with.

Key terms

Neurological damage: damage to the body’s central and peripheral nervous system.

Visual agnosia: an inability to recognise things that can be seen.

Prosopagnosia: ‘face-blindness’ or an inability to recognise faces.

Pre-frontal cortex: the area of the brain’s cortex at the very front of the frontal lobe, immediately behind the forehead.

Agnosia: an inability to interpret sensations and thus to recognise things.

Prosopagnosia

Prosopagnosia (also known as 'face-blindness') means being unable to recognise faces even though they can be seen. The eyes can send information to the brain about the face, but the brain is unable to recognise who the face belongs to, even though they might know the person very well. In some cases, people with prosopagnosia cannot recognise family members, including their own children. Prosopagnosia can be caused by damage to a part of the brain near the back of the temporal lobe, next to the occipital lobe, known as the **fusiform face area (FFA)**.

Symptoms of prosopagnosia

Patients with prosopagnosia find it difficult to identify people from their faces. Some people find that they see all faces as 'the same' and cannot tell faces apart. Some find that they cannot recognise faces of people that they know really well, while other people have more trouble with matching up pictures of faces that they do not know.

Develop it

Visual agnosia and prosopagnosia are complex disorders that can be caused by damage to parts of the brain. No two people with these disorders have exactly the same symptoms.

Carry out some research to find out about what effects visual agnosia and prosopagnosia can have on different people.

Key term

Fusiform face area (FFA): part of the temporal lobe, close to the occipital lobe, that is thought to help in face recognition.

Impact of damage to the pre-frontal cortex

The pre-frontal cortex helps us to control our impulses, so it is the part of the brain that will stop you from doing something like hitting someone when you are angry. It is also the part of the brain that helps us to keep our emotions balanced so that we do not get too emotional, no matter what emotion we are feeling. If this part of the brain is damaged, people can become impulsive and aggressive.

Damage to the pre-frontal cortex can make it difficult for people to control their emotions, and so their personality may seem to change quite a lot. For some people, this type of damage can mean they are more likely to commit crimes that they would not have done before. Adrian Raine et al. (1997) studied the brains of murderers and compared these to a similar group of people who had not committed murder. He found that there were differences in the pre-frontal cortex of the two groups. Murderers had less activity in the pre-frontal part of the brain, making them more impulsive and maybe more aggressive. This has been used as an explanation for why some people are more prone to violent and impulsive behaviour than others.

Link it up

Hanna Damasio and others studied pre-frontal brain damage in the case of Phineas Gage. Read ahead to find out more about this research and what they found.

Studies

Damasio et al. (1994) The Return of Phineas Gage: Clues About the Brain from the Skull of a Famous Patient

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

In 1848, Phineas Gage was working on a railway line in the USA when an explosion caused an iron rod to be fired through his head. Although it caused serious damage to his face and the frontal lobe of his brain, Gage survived the accident and recovered quickly from his physical injuries. However, his personality underwent a permanent change. Before the accident, Gage was described as a calm and responsible man, who was well liked. After the accident, he was irresponsible and rude – a very different person to the old Phineas Gage.

Many psychologists have used the evidence gathered from Gage's doctor, John Harlow, to try to understand what it

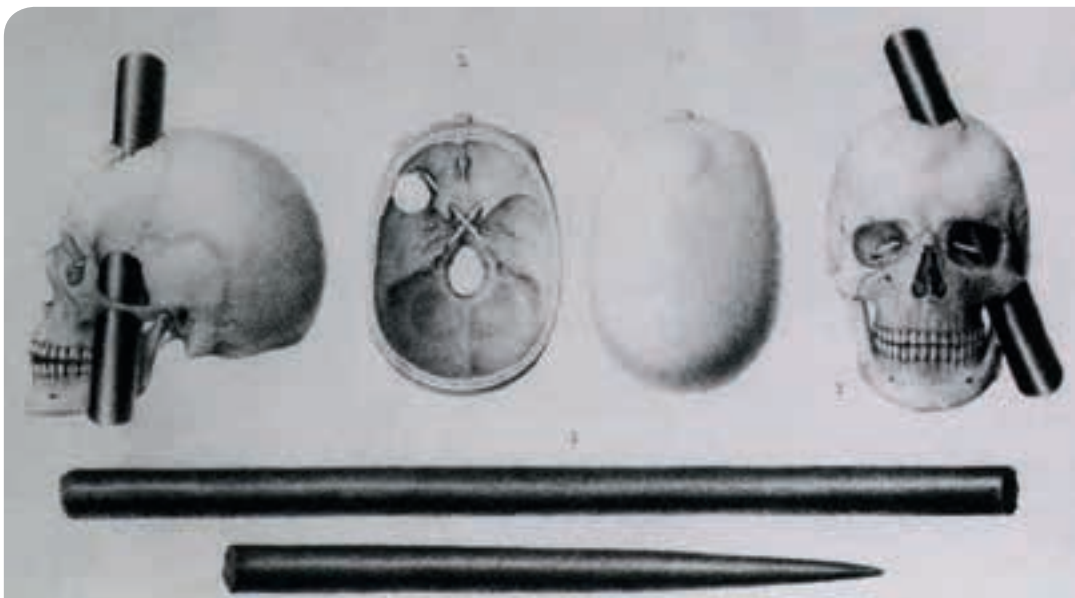
teaches us about the role of the frontal lobe in the brain. Gage died 12 years after his original injury following severe epilepsy as a result of the accident. When Harlow learned of his death several years later, he requested that his body was exhumed so that he could study his skull. The skull has been kept ever since in the library at Harvard University. Hanna Damasio and her colleagues were able to use this skull to further understand the damage caused to Gage's brain using more modern methods of investigation.

Aims

In 1994, Damasio et al. wanted to build a model of Gage's skull using his actual skull as a guide, so that they could map out how the iron rod passed through his head. Using data from Gage's skull, the researchers were able to create a 3D computer representation of the skull, including the holes made by the iron rod. This meant they were able to identify which parts of his brain were most likely to have been badly damaged in the accident. Damasio et al. wanted to discover if areas other than the frontal lobe had also been damaged. As the iron rod caused most damage around the forehead, it was assumed that the damage was mainly in the frontal lobe. Damasio et al. wanted to discover if any other areas had also been damaged in the accident.

Link it up

Brain-scanning methods are discussed later in this topic, in the *Issues and debates* section.



From your knowledge of the regions of the brain, what effects would you expect to see in Gage after suffering extensive damage to his frontal lobe?

Procedure

Damasio et al. began by taking pictures and measurements of the skull of Phineas Gage. From the information gathered, they built a virtual 3D replica model of a skull that matched the measurements of Gage's skull.

As the iron rod had been buried with Gage, they were able to take actual measurements of the rod, which was 3 cm in diameter and 109 cm long. They compared this to the parts of the skull that were damaged in order to work out the likely path that the iron bar would have taken as it blew through his head. To do this accurately, they matched up the possible entry and exit points for the iron rod on their model.

In total, 20 different entry points and 16 different exit points were tested to try to find the most likely path taken by the rod. Once they had found the five most likely paths, Damasio et al. used the virtual replica model of Gage's brain to map out which areas would have been damaged in each case.

Results

Damasio et al. found that there was likely to have been damage in both the right and left hemispheres of the frontal lobe in Gage's brain. They were able to confidently assume that the brain damage suffered in the accident was likely to only have affected the frontal lobe, and no other areas of the brain. The iron bar would have passed through the left eye socket and upwards through the head (Figure 4.5). This meant that there was likely to have been more damage to the underlying **white matter** in the left hemisphere than in the right frontal lobe. The white matter is where all of the neurons pass their messages along the axon fibres. Damaging this area would have meant Gage was unable to pass neural messages in this part of his brain, making it useless. The damage in both hemispheres seemed to be worse in the middle of the underside (ventromedial region), while the top edges (dorsolateral regions) of the frontal lobes were less likely to have been affected.

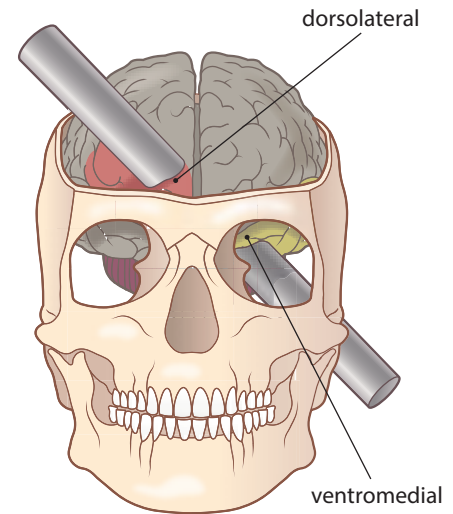


Figure 4.5 Gage was very lucky to survive an iron rod being blown, with force, through his head like this

Key term

White matter: brain and spinal cord tissue, consisting mainly of nerve fibres (axons).

Link it up

Look back at *The role of the central nervous system* to remind yourself about how neural messages are passed on.

The brain and neuropsychology – how does your brain affect you?

Conclusion

The researchers compared areas of Gage's brain that were most likely to have been damaged with the reported changes in his personality after the accident. From this, they concluded that the ventromedial area of the frontal lobes seems to be important for making sensible decisions and controlling our impulses around people. It also seems to be important for the control of emotions, as Gage found this very difficult after his accident. This evidence appears to support other findings that have been gathered from case studies of people with brain damage in similar areas. Damasio et al. had evidence of 12 other patients with similar frontal lobe damage, who all showed the same problems with impulse and emotional control. This knowledge can be used to predict the behaviour of someone who suffers brain damage in these areas in the future.

Strengths and weaknesses of the study

One strength of Damasio et al.'s (1994) study is that the researchers were able to use modern-day technology to investigate the data from 1848, meaning the results can be given more scientific status. The use of a computer model meant the evidence could actually be seen, rather than just inferred from the information gathered after the accident first happened. This further increases the scientific understanding of the case of Phineas Gage.

Another strength of this study is that we can now make predictions about what changes to behaviour we might expect if someone has damaged their frontal lobes. If a patient damaged the frontal lobe in a similar area to Gage, we can predict that they might be more impulsive and less able to control their behaviour. Knowing this could help the family understand what might happen and why it is happening, and it could also be useful for helping to treat the person after the brain damage.

One weakness of Damasio et al.'s study is that, even though they used an exact replica of Gage's skull, the information about how the accident happened is based on reports originally gathered over 150

years ago. This means that the information might not be very accurate, or is simply a guess from the reports they could find, so it may not be very reliable.

There is also a problem in generalising the information about this case study to other people because the brain damage was unique to Gage. It is very unlikely someone else will have exactly the same damage, so the information might not be very useful for helping us to understand what might happen to another person with frontal lobe damage.

Link it up

Reliability and generalisability are discussed in Topic 11 *Research methods*.

Sum it up

Phineas Gage's brain damage has become famous in psychology – it is one of the most serious cases of brain damage that did not result in death. Psychologists had previously suggested that the damage to his brain could have been widespread, spreading throughout different lobes of his brain. Damasio et al. (1994) were able to replicate the accident on a model of his skull and brain and conclude that damage was likely to be confined to the frontal lobes only. From this, they concluded that the frontal lobes are likely to be involved in decision-making and impulse control.

Exam-style question

Explain **one** strength and **one** weakness of Damasio et al.'s (1994) study. **(4 marks)**

Exam tip

This question requires you to evaluate the study by Damasio et al., so you do not need to describe the study. However, you will need to select appropriate details from the study to support the strength and weakness that you identify.

Sperry (1968) Hemisphere Deconnection and Unity in Conscious Awareness

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Some patients with severe epilepsy who had not responded to treatment were offered surgery to help reduce their seizures (fits). The surgery involved cutting down the corpus callosum to disconnect/separate the right and left hemispheres. These patients reported very few (if any) obvious effects of the surgery other than a reduction in symptoms of their epilepsy. Research seemed to suggest that without a corpus callosum, the left and right hemispheres of the brain worked like two separate brains (a 'split-brain') instead of one whole brain.

Aims

In 1968, Roger Sperry studied what effects could be seen in these patients by monitoring how they processed information using their 'split-brain'. He was interested to see how the 'split-brain' worked compared to a normal brain.

Link it up

The role of the right and left hemispheres is discussed earlier, in the section *Lateralisation of function in the hemispheres*.

Procedure

Sperry studied a group of 11 participants who had had their corpus callosum cut. They were each given various tasks to test how they processed different types of information in the 'split-brain'.

One of the most well-known tests used by Sperry was a visual task where participants focused on the centre of a screen on which information was presented to the left and right side of the visual fields at the same time. Two different words or pictures were presented – one on the left of the mid-point and one on the right. This means that the left side of each eye would pick up one image (the one on the right of centre), while the right side of each eye would pick up the other image (the one on the left of centre.) The information on the right of the visual field would be passed to the left hemisphere, while information on the left of the visual field would be passed to the right hemisphere. The participants were then asked to say the word/s or picture/s that they had seen on the screen.

On some occasions, rather than say the word(s) or identify the picture(s), the participants would be asked to point to an item or picture. They would be shown a variety of objects or pictures including the one they had just been shown. They would then identify what they had seen using either the same hand, or the hand on the opposite side of the body.

Other variations of this task included putting unseen objects into one of the hands and asking them to identify them from touch alone, and placing different objects in each hand and then asking them to feel for them in a large pile of different objects.

All of these tasks involved the same basic process – sending different types of sensory information to the left and right hemispheres, and then asking the brain to respond to the information using either the same or the opposite hemisphere.

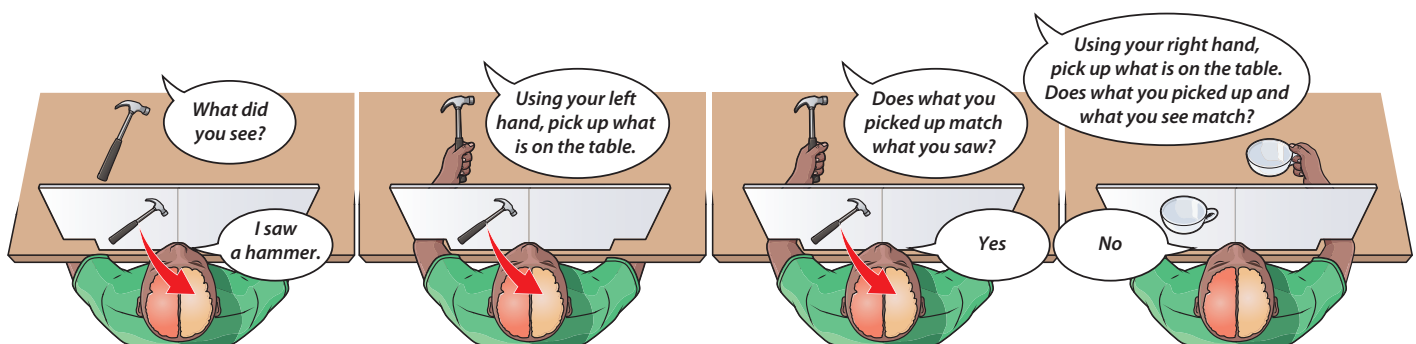


Figure 4.6 Visual information to the left of both eyes goes to the right hemisphere and to the right of both eyes goes to the left hemisphere. Information about touch from the left hand goes to the right hemisphere, and from the right hand goes to the left hemisphere. Someone with a split brain cannot exchange information from the two hemispheres. So if information goes to the right of both eyes (left hemisphere) and comes into the left hand (right hemisphere) the person cannot match the two pieces of information.

The brain and neuropsychology – how does your brain affect you?

Link it up

Validity and ecological validity are discussed in Topic 11 *Research methods*.

Sum it up

Sperry found that the left and right hemispheres control different abilities. When the connections between the two hemispheres are broken, it is easier to observe what each hemisphere does. Patients who have had the 'split-brain' procedure give us strong evidence of the tasks controlled by each hemisphere, as their brains can no longer share information by passing it across the corpus callosum.

Try it

It is unlikely that anyone in your class will have a 'split-brain' (although you never know!), but that does not stop you having a go at a split-brain study. Set up a replication of one of Sperry's basic procedures to see how you and your classmates do. In small groups, gather a selection of small items together. Take turns to blindfold individuals, give them an object in their left hand and get them to identify it. Time how long this takes them. Then do the same with an object in their right hand. Is there any difference in how long it takes? When you have some data, analyse your results and see if you can explain what has happened.

Results

Results for the tasks involving reading words or selecting objects were seen to be different:

- When words were shown to the right visual field, the patients had no problem repeating the word back to the researcher. However, when words were shown to the left visual field (sent to the right hemisphere), patients had trouble saying what they had seen.
- If a word or picture was shown to the left visual field (right hemisphere), the participants had little trouble selecting an object that matched what they had seen. When the word or picture was shown to the right visual field (left hemisphere), the participants struggled to point to the correct object.

Similar results were found for objects presented to each hand:

- When objects were felt by the right hand (so passed to the left hemisphere), they could name the object. When objects were felt by the left hand, they found it more difficult to say what they could feel.
- When two different objects were given to the participant – one in each hand – and after they were asked to feel around in a pile of objects for the two objects, they could only identify each item with the hand that originally held it. If the opposite hand picked up the item, they could not identify it as the item they had held before.

Conclusions

Sperry suggested that each hemisphere is capable of working perfectly well without being connected to the other side. However, each hemisphere seems to have its own memories, which, without a corpus callosum, could not be shared with the other side. This caused problems for some activities, supporting the idea that the right and left hemispheres have different roles. The left hemisphere seemed to be better at naming items using words when they had been held by the right hand. However the right hemisphere was better at identifying objects by feeling for them with the left hand after previously being held by the left hand. This supports the idea that the left hemisphere controls more language abilities, but the right hemisphere controls spatial abilities.

Strengths and weaknesses of the study

Sperry gathered a lot of detailed information, improving the reliability of his study. Another strength is that he designed procedures (such as the split-screen for presenting visual information) that could be kept the same for each participant. This means that the data was gathered in a reliable way and each participant's results can be compared more easily.

A weakness of Sperry's study is that the sample of 11 participants is too small to be able to generalise the results very confidently. Very few people have surgery to sever the corpus callosum so the results might not be that useful for explaining how 'normal' brains work. Another weakness is that the tasks Sperry had the participants do in the laboratory may be very artificial. It is not often you will be asked to look at a picture with one eye, and then point to the same picture with your hands. This means the results may lack ecological validity.

Issues and debates

How psychology has changed over time

What you will learn

- How psychology has changed over time.
- Concepts, theories and research drawn from studying the brain to explain how psychology has changed over time.

Psychology is defined now as ‘the scientific study of the human mind and its functions, especially those affecting behaviour in a given context’ (Oxford English Dictionary, 2017). Psychology has been developing over the past 200 years. It started as a philosophical discipline and is now widely regarded as a science alongside biology, chemistry and physics. The way psychologists work and how they study behaviour has also changed over time. This section will explore just how psychology has changed since the very beginning – from the early work of Wilhelm Wundt in the 1870s to the modern work of psychologists, including the development of **neuroscience**.

Key terms

Neuroscience: the scientific study of the brain and nervous system.

Post-mortem: an examination of a body after death, often to work out how or why the person died.

Develop it

Carry out some research and draw up a timeline of how the methods used to study the brain have changed over time. In the 5th century BC, for example, a Greek doctor called Alcmaeon first used dissected animals to develop theories about the body and suggested that the brain was the most important organ in the body. Several years later, people began dissecting humans and studying their brains after death. This is very different to how brains are studied in modern psychology. See what you can find out about how the early medical study of the brain has adapted into modern psychology and neuroscience.

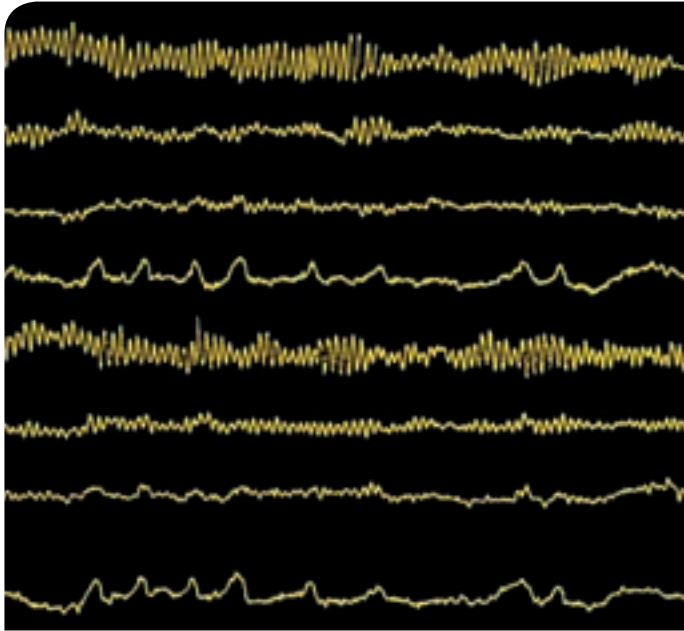
How has the study of psychology changed over time?

Psychology was ‘born’ in 1875 when researcher Wilhelm Wundt opened a laboratory in Leipzig, Germany, to study people’s thoughts. Before this, people had not really considered what happened inside our heads, they were more interested in the anatomy of the brain itself rather than what it does. Cases like Phineas Gage, who had his accident in 1848, had started to encourage doctors to investigate how the brain itself was involved in the control of specific behaviours. Studying the brain at that time was only really possible after someone had died, when the brain could be removed during a **post-mortem**. Although Gage lived a further 12 years after his accident, the level of understanding of how the brain and behaviour were connected was still very limited. After the study of psychology as we know it began with Wundt, people began to make more connections between the physical brain and human behaviour.

Link it up

Look back to the study by Damasio et al. (1994) to remind yourself about what happened to Phineas Gage.

The brain and neuropsychology – how does your brain affect you?



EEGs can show patterns of brain activity using electrical impulses detected through the scalp

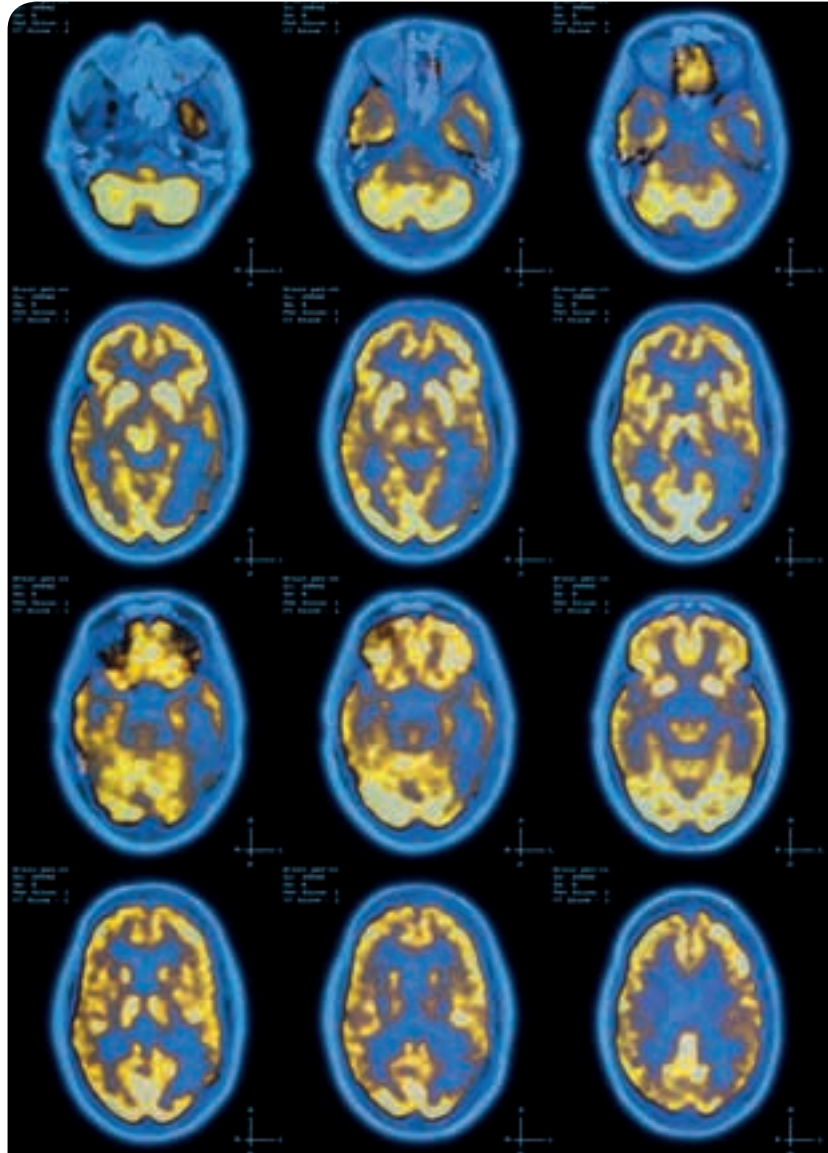
In 1924, Hans Berger developed the **EEG (electroencephalograph)** as a way to measure brainwave activity in a living brain. This was the start of ways to study the brain that did not rely on the patient being dead. In EEGs, electrodes are placed onto the scalp to pick up the general level of activity in different areas of the brain. This tells the researcher which parts of the brain are working hardest when the person is doing different activities.

Link it up

The EEG is discussed in Topic 9 *Sleep and dreaming*.

This then led to more modern forms of brain scanning such as **MRI (magnetic resonance imaging)** and **PET (positron emission tomography)** scans that give us more detailed information about how the brain works. These scans can show detailed pictures of what the brain looks like or images that show how active different parts of the brain are at different times.

An advantage of using brain scans to study the living brain, rather than post-mortem studies, is that it provides the opportunity to help people living with brain damage. If we can see where the damage is, and understand how that area is working (or not working), then help can be given.



PET scans show colour images of brain activity by detecting areas of high and low metabolism. They use warm colours to show higher energy areas, and cool colours for low activity areas

Key terms

EEG (electroencephalograph): a method of measuring brain activity using electrodes placed on the scalp.

MRI (magnetic resonance imaging): a method of studying the brain using electromagnets.

PET (positron emission tomography): imagery showing the amount of energy being used throughout the brain.

More modern methods are being developed today which allow psychologists to use high-powered microscopes to look at how individual synapses work. From this, theories can be developed about exactly which parts of the brain control what kinds of behaviour. Rather than looking at general brain areas, it is possible to investigate behaviour at the level of the neuron. For example, evidence has shown that people with risk-taking and impulsive behaviour often have high levels of dopamine in their nervous system, caused by a lack of neural receptors that reduce dopamine levels (Zald et al., 2008). Research like this will further develop our understanding of what the various areas of the brain do.

Since the first split brain research by Sperry (1968) began to develop our understanding of the role of the left and right hemispheres, new research methods have permitted much greater advances to be made. Brain scans enable researchers to identify specific areas in the brain that are associated with certain tasks. Our knowledge of the roles of the left and right hemispheres has developed greatly since the first studies by Sperry.

Exam-style question

In their psychology lesson, the students were talking about how studying human behaviour has changed over time. Dexter said he was more interested in the modern study of psychology, especially how the brain could be understood now. Hermione said she was more interested in the early study of psychology, so she could compare that to what we understand now. Assess how the study of psychology has changed over time. You should refer to how studying the brain has changed in your explanation.

(9 marks)

Exam tip

'Assess' questions require extended writing, featuring full sentences and paragraphs to clearly separate out your ideas. You should plan your answer before you start to make sure you do not leave out something important when you are writing.

Psychology in action

Understanding the brain's role in behaviour can be used to try to understand criminal behaviour. In 1999, a young male named Donta Page murdered 24-year-old Peyton Tuthill in Colorado, USA. He broke into her house, tied her up and stabbed her multiple times. During his trial, evidence was presented that during childhood, Page had suffered years of physical abuse that had caused him serious harm. Psychologist Adrian Raine scanned Page's brain and found that he had suffered damage to his pre-frontal cortex, probably as a result of the abuse in his past. This was presented in his defence in court as a possible reason for his violent behaviour. Understanding the brain could help us to understand criminal behaviour. It could also challenge our understanding of criminal guilt if we know that there are reasons for a person's crime that were beyond their control.



Topic 5 | Social influence – How do others affect you?

Exploring the topic

Social influence is about how others – groups and individuals – can influence your behaviour. We tend to believe that we make our own decisions and choose our own behaviour, but often other people can impact and influence us.

Have you ever been a bystander at an incident? Did you stand by and watch or choose to help? We like to believe that in an emergency situation we would be the one to intervene and help. However, there are a number of factors that determine whether or not you are willing to help, depending on the situation and what type of person you are.

It is really important to understand how others influence our behaviour because then we can promote good behaviour and prevent bad behaviour, such as bullying. Social psychology can give us insight into why we behave in certain ways around others and how we can go about understanding ourselves better in our social world.

Your learning

In this topic you will learn about:

- the key terms associated with social influence
- factors that affect bystander intervention
- factors that affect conformity to majority influence
- factors affecting obedience to authority figures
- how conformity and obedience influence crowd behaviour
- ways to prevent blind obedience to authority
- social influence studies by Piliavin et al. (1969) and Haney, Banks and Zimbardo (1973)
- issues and debates around social and cultural issues in psychology.

Getting started

Get started on this topic by thinking about how friends, family, teachers and even strangers may influence your behaviour. Consider how you and your friends probably share similar interests and wear similar clothes. Is this by chance or do others affect how you behave and feel?

Social psychology tends to focus on the negative aspects of social influence. Historical events, such as the atrocities committed during the Second World War and the torture of the prisoners of war in Abu Ghraib prison, have all been explored using the concepts of obedience and conformity. You can begin by researching these events to understand the contribution social psychology has made to understanding why they might have occurred.

More recently, social psychology has been exploring the more positive aspects of social influence. Dr Philip Zimbardo has been using our knowledge of social influence in his Heroic Imagination Project to emphasise how we can use these concepts for good – to promote heroism. Conduct an internet search on his Heroic Imagination Project.



Have you ever wondered how your family influence your behaviour?

Social influence – How do others affect you?

Terms used in social influence research

What you will learn

The meaning of the terms associated with social influence.

Obedience

Obedience means complying with the request or order of an **authority figure**. As humans, we are quite obedient. You will have tidied your room if a parent asked you, or stayed quiet in class if a teacher asked for silence. Most of the time obedience to an authority figure is quite mundane and relates to everyday experience. Imagine, however, if you were asked to do something you believed to be morally wrong. Would you obey the order if it was against your beliefs? Fortunately, many of us are rarely in this position. However, servicemen and women of our armed forces might be faced with an order from a higher ranking officer to do something they would not willingly do.

Link it up

The development of morality is discussed in Topic 1 *Development*.

Most of the time obedience can be seen as an important social process that helps maintain social order, such as obeying parents or school rules. But sometimes obedience can be undesirable as it can lead to doing something wrong or harming another.

In psychology, research into obedience began after the Second World War. Psychologists were interested in why German soldiers were willing to harm Jews and other prisoners of war at the orders of their commanding officers. Research found that German soldiers were just like anyone else given an instruction to follow by an authority figure – they were just obeying orders. As much as we would like to believe that we would never harm another human being on the orders of another, the reality is that under certain conditions many of us are capable of doing harm.



Why do you think we dress and act in a similar way to our friendship group?

Key terms

Obedience: complying with the orders of an authority figure.

Authority figure: someone with more power and control than another.

Conformity: matching the behaviour and beliefs of others in order to fit in or because we do not know how to behave in an unusual situation.

Conformity

Conformity is the behaviour of following what the majority of people are doing. We often follow a crowd, possibly by dressing like our friends or buying the latest games because our peers have them. Conformity helps us fit in to a social group.

There are three types of conformity:

- compliance
- internalisation
- identification.

Compliance as explained by normative social influence

Compliance involves going along with the majority although privately we may not actually agree with them. For example, all your friends are buying a certain brand of trainers and although you do not like the brand, you buy it anyway. This type of conformity can be explained by **normative social influence**, where we follow the group norm because we want to be accepted and not rejected.

Internalisation as explained by informational social influence

Internalisation occurs when you are placed in a situation where you do not know how to behave. This can be explained by **informational social influences** – you look to others, observe their behaviour and copy them because you are uncertain of how to behave yourself. You look to the majority for this information and follow their lead, as you believe this must be the correct way to behave. This is known as internalisation because you are not superficially going along with the crowd; instead, your attitude becomes consistent with the majority.

Identification

Identification is similar to compliance. A person will change their behaviour and beliefs while in the company of a group, but this only lasts as long as the group is present. Identification is likely to be a temporary change in behaviour and beliefs because of a group membership. This occurs because we like to be defined as a group, so we adopt their beliefs and values to fit in. In this way it can be seen as short-term normative social influence. You will see this type of identification when you go to college or university, or begin employment in a company or institution. You may, for example, wear different clothes and act similarly to the group, but when you are at home you revert back to wearing and doing what you want.

Deindividuation

Deindividuation is the process of losing our own personal identity when we are part of a crowd or group. When we lose our individual identity we blend into a group and become anonymous – we do not stand out in the crowd. As a result, we tend to act differently and feel less responsible for our own actions. Think about a riot. The members of the riot may cause damage to property or even harm another person as a result of their loss of self-awareness. Such behaviour would not occur if they were acting alone.

Link it up

You will see identification and deindividuation occur within the prisoners and guards in the Haney et al. (1973) study discussed in the *Studies* section.

Develop it

Derren Brown has hosted television programmes that demonstrate deindividuation, obedience and conformity. Conduct an internet search and view these programmes.

Key terms

Compliance: going along with the majority even though we privately do not agree.

Normative social influence: compliance because of the need to fit into a group.

Internalisation: going along with the majority because we do not know how to behave in a situation – we adopt the beliefs of the group.

Informational social influence: conformity because we do not know how to behave; others provide this information so we adopt their beliefs and behaviours.

Identification: temporarily adopting the behaviours of a role model or group.

Deindividuation: loss of personal self-awareness and responsibility as a result of being in a group.

Apply it

A group of friends were shown images of how our meat is produced in school. Some did not like the way meat is produced and thought meat processing was unkind to animals. As a result, Olwyn and her friends decided to become vegetarian. Amanda went along with her friends and became a vegetarian, too, but secretly she still wanted to eat meat.

Using your knowledge of types of conformity, explain Olwen and Amanda's behaviour.

Social influence – How do others affect you?

Key term

Bystander effect: sometimes called bystander apathy, when we fail to help another in need.

Bystander effect

In 1964, a young woman called Kitty Genovese was brutally murdered outside her New York apartment. Although there were many witnesses to the event, none immediately stepped in to help her. Psychologists Bibb Latané and John Darley explained this **bystander effect** (sometimes called bystander apathy) as people's reluctance to help because they believe others will help instead. We also look to others to see how to behave, so if no one else is helping, we will not help either.

Exam tip

You will need to be able to apply your knowledge of the key terms in many different scenarios, such as those presented here. Try to think of other situations where the key terms of 'conformity', 'bystander effect' and 'deindividuation' could be used, to help with your revision.

Exam-style question

Complete the table with the correct term for each description. (3 marks)

Description	Term
Although Elliot preferred classical music, he listened to pop music with his friends because they liked it.	
Louis saw a person stumble and fall in the street. He thought they must be drunk so he did not stop to help.	
When Carolyn put on her police uniform for work she could not be her usual silly and fun-loving self because she was expected to act as a police officer would.	



Have you ever walked by someone who you thought may have needed help? Consider why you walked by and did not offer help. Perhaps you thought they were dangerous or drunk. Maybe you thought they did not need help because other people were walking by. Or maybe you believed someone else would help them.

Bystander intervention

What you will learn

- Why some people are willing to help and others are not.
- The conditions under which bystanders may intervene.

Whether we choose to help someone in need or not is dependent on many factors that can be broadly defined as **situational** and **personal**. Situational factors are features of a situation that influence how likely we are to intervene in an emergency. Personality factors are features specific to us (e.g. traits, abilities or feelings) that influence whether we help or not.

Situational factors affecting bystander intervention

Diffusion of responsibility

One of the main reasons for the bystander effect is because we feel less personally responsible when there are more people around to potentially help. When we witness an emergency situation in a crowd, the larger the crowd is, the less responsibility individuals feel to intervene because we diffuse the responsibility onto others. We justify our inaction because there are plenty of others who can help instead. In a smaller crowd, we may feel more inclined to intervene and help because there are fewer people to share responsibility with. This social influence on our behaviour is called **diffusion of responsibility**.

Noticing the event

In large crowds we tend to keep ourselves to ourselves and pay less attention to what is going on around us. We are therefore less likely to notice an emergency situation than when on our own. If you were in a room and smoke started billowing under the door, you would probably notice this and raise the alarm straight away. Latané and Darley (1969) conducted such an experiment where participants were alone or in groups. They found that we take longer to notice the smoke and are slower to react when in a group compared to when we are alone in the room.

Pluralistic ignorance

Another reason for the bystander effect is because, when in situations, we often look to others and react based on what other people are doing. We look to others to help us interpret the situation. If we see a large number of people not helping, we are likely to interpret the situation as a non-emergency, even if that is not the case. However, if we witness other people helping, we are likely to offer assistance as well. This social influence on our behaviour is known as **pluralistic ignorance** (similar to informational social influence). In a smaller crowd, we may feel more inclined to intervene and help because there are fewer people to share the responsibility. In an emergency, we are less likely to be influenced by the behaviour of others.

Key terms

Situational factors: features of a situation that influence whether or not we intervene in an emergency.

Personality factors: features of an individual (e.g. traits) that influence how likely they are to intervene in an emergency.

Diffusion of responsibility: when we believe others will help so we do not have to.

Pluralistic ignorance: when we interpret the situation according to others' reactions.

Social influence – How do others affect you?

Apply it

Jerome was shopping in a busy high street when he saw what he thought was a drunken person collapse in the street. Jerome walked past and did not help.

Using your knowledge of situational factors that influence bystander intervention, explain why Jerome failed to help.

Cost of helping

Sometimes we evaluate the situation as having too high a cost as it risks harm to ourselves, so we choose not to help. If an emergency situation is judged as dangerous, such as intervening in a fight, we tend not to risk getting involved. Similarly, if we are in a rush and do not have time to stop, we are less inclined to help as it is a cost to ourselves. However, if the cost of not helping is great, such as a person experiencing a dangerous emergency, then we are more likely to help because the cost for the victim is greater than the cost to ourselves. This may appear to be a selfless act because we are placing ourselves in harms way for another, but actually we may be selfishly trying to avoid the guilt we would experience had we not helped.

Personal factors affecting bystander intervention

Competence

If we feel competent enough to help, this can influence whether we help or not and the type of help we give. For example, if we are trained in using CPR to resuscitate a person who has stopped breathing, we are more likely to intervene in a situation where this is required and would perform the skill directly to the victim. Without such competence, we are less likely to help. Further to this, if we do help we are more likely to offer indirect intervention, such as calling for an ambulance.

Mood

People are more likely to intervene and help another if they are in a good mood. When we are in a bad mood or feel sad, we tend to focus our attention inwardly on ourselves. When in a happy mood, we tend to look outward and pay attention to others around us. This gives us the opportunity to perceive others in need of help and go to their assistance.

Similarity

If we perceive ourselves as similar to a person in need, we are more likely to help them. We identify with the victim and we can see how the same fate may be true for us. If you were a victim of bullying at school, for example, it is likely that you might intervene in a bullying incident because you perceive yourself as similar to the victim.

In cases where people fail to help, it is often assumed that the person not helping does not care or that they lack moral character. However, psychological research indicates that although some personality factors can influence whether or not we help, bystander intervention is largely influenced by situational factors.

Try it

A lot of social influence research is unethical, so it would not be appropriate for you to conduct a practical investigation into obedience, for example. However, you could try a small-scale practical investigation to examine the bystander effect without distressing or harming anyone. For example, you could drop a pile of books and see who comes to your assistance. You must not pretend to collapse or feign being hurt as this will upset others around you.

Exam-style question

Many people give to charity and some choose not to. The Salvation Army often uses volunteers to raise funds. They usually hold a collection box in a shop or on the high street.

Explain, using your knowledge of bystander intervention, why some people are willing to give money to the Salvation Army while others choose to walk on by.

(3 marks)**Exam tip**

You will need to apply your knowledge of the factors that influence bystander behaviour in many different contexts. First, list all the factors that influence bystander behaviour and then see if any factors are relevant to the exam question.

Psychology in action

Understanding bystander behaviour is very important as it can be used to help prevent bullying. Most bullying occurs when adults are not around, so educating children to intervene to prevent bullying can be really useful. Anti-bullying programmes suggest that children are educated to intervene by understanding the following:

- Children should be encouraged to tackle bullying by taking responsibility in a situation and offering help. Children need to understand that it is their responsibility to act rather than wait for someone else to do so.
- Children should be encouraged to empathise and understand how it feels to be bullied so that they can feel a connection to the person being bullied.
- Children should feel confident that if they intervene it will have a positive outcome and will not negatively impact on them personally.

Social influence – How do others affect you?

Conformity

What you will learn

- Why some people are more likely to conform to majority influence.
- The situations in which we are more likely to conform.

We conform when we match other people's beliefs and behaviours because we want to fit in or we do not know how to act in a situation. Arthur Jenness (1932) asked participants to guess how many beans were in a glass bottle. He found that participants were likely to change their first guess following a discussion with a group. Presumably this was because they did not know the answer, so looked to others as a source of information. This is a good example of informational social influence.

Some people are more likely to conform because of the situation they are in, and personality factors also determine whether a type of person is more likely to conform or not.

Situational factors affecting conformity

Size of the majority

If one of your friends turned vegetarian, would you be likely to become a vegetarian as well? Probably not. But if two or three friends stopped eating meat, there would be a greater likelihood of you giving up meat too. The general rule is: the greater the majority, the greater the influence they have on your behaviour. However, this only happens up to a point.

During the 1950s, Solomon Asch conducted some experiments looking into conformity. A participant was placed around a table with confederates. The **confederates** pretended to be genuine participants, but had been instructed on what to do in the experiment. The experimenter presented the group with a card displaying three lines of differing lengths labelled A, B and C (Figure 5.1). They were then shown a second card with a single line on it, and asked to say which of the three lines it resembled. The confederates all lied and picked a line that was nothing like the line on the second card. The participants heard the confederates' answers and so some of them then also picked the wrong line. When there was only one confederate in the room the conformity rate was only 3 per cent, with two confederates it rose to 13 per cent, and with three confederates it rose to 32 per cent. This experiment demonstrates normative social influence.

The optimal number for a majority to exert an influence appears to be around three to four people. More than four tends to arouse suspicion, as Asch found that his participants probably guessed that there were too many picking the wrong line for it to be true.

Key term

Confederate: a researcher or other person who is acting in a study but does not know what the study is about.

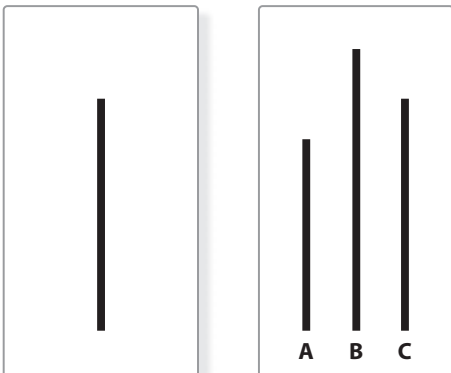


Figure 5.1 The cards used in Asch's experiments

Try it

Do your own research using Asch's line cards. Print out a copy of the lines that were used and see if your friends can judge which line would match the comparison line. Would they pick the correct line if others failed to do the same?

Unanimity of the majority

If some of your friends turn vegetarian but some do not, then you will be less likely to be swayed to give up eating meat. This is because there is disagreement among the majority; the decision to change is not unanimous. You therefore have social support from some friends if you decide to not convert to being vegetarian.

Asch found the same effect in his conformity experiment. If most confederates picked the wrong line, but one picked the correct line, the participant was less likely to conform.

Task difficulty/ambiguity

If the task we are performing is difficult or ambiguous, then we are more likely to look to others for the right answer. This is an example of informational social influence – we are unsure how to behave so we mimic others around us. Asch also found this effect. In his original experiment, the comparison line was clearly the same as one of the three lines on the card, and very different from the other two. However, when the three lines were more similar to the comparison line, he found a higher rate of conformity because it was ambiguous.

Apply it

A group of five students were given a class test on the capital cities of the world. A multiple-choice question asked for the capital city of Australia. The options were:

- Sydney
- Canberra
- Brisbane.

The students discussed the answer and four of them decided to select Sydney as their answer. The fifth student was not sure, but decided that Sydney sounded about right. They all marked Sydney as their answer on the test.

Using your knowledge of situational factors affecting conformity, discuss the choice made by the fifth student.

Personality affecting conformity

Locus of control

Locus of control is the part of our personality that refers to how much control we believe we have over our own behaviour.

- If we feel that we have a lot of personal control over our own behaviour, we are said to have an **internal locus of control**. For example, if we passed a test we would believe that it was due to working hard, competence and getting what we deserved.
- If we feel that we do not have control over our behaviour – we believe it to be caused by something external to us – we are said to have an **external locus of control**. In this case, we would believe that we passed a test because good questions came up, or we were lucky.

A person with an internal locus of control is less likely to be influenced by others around them and, therefore, less likely to conform. Whereas someone with an external locus of control is more likely to be influenced by other people's behaviour and so be more likely to conform.

Whether we conform also depends on the situation and other personality factors. Even if you had an internal locus of control, for example, you may still be influenced by others if you were starting a new school or you were placed in an unfamiliar situation. Similarly, if you lacked status in a peer group, you would probably be more likely to try to fit in regardless of your locus of control.

Key terms

Locus of control: the extent to which we believe we have control over our behaviour/life.

Internal locus of control: when we feel we have personal control over our own behaviour.

External locus of control: when we feel that factors external to us control our behaviour.

Social influence – How do others affect you?

Obedience to an authority figure

What you will learn

- Why some people are more likely to obey the orders of an authority figure.
- The conditions under which people are more likely to be obedient.

Obedience refers to following the orders of an authority figure. This authority figure is typically defined by status, role and/or the ability to use sanctions. A parent can be described as an authority figure because they can remove your pocket money; a police officer has a role of authority recognised by their uniform; and a peer can have greater status in your friendship group.

Obedience is not necessarily a bad thing. We maintain social order by complying with orders, such as wearing school uniform or stopping at a red traffic light. However, some obedience can be considered bad because it may harm another person. **Blind obedience** occurs when we comply with the order of an authority figure without question. This may be harmful because we fail to reflect on whether our actions are appropriate and fail to take responsibility for such actions.

Key terms

Blind obedience: when we comply with the orders of an authority figure without question; this tends to be associated with a negative outcome.

Anti-Semitic: negative attitudes, prejudice or discrimination against Jews.

During the Nazi regime in Germany, many soldiers committed acts of atrocity against millions of innocent Jews, Gypsies and persons that did not support the Nazi government. These soldiers were complying with the orders of their superior officers, often unquestioningly. No one would argue that blind obedience was the sole cause of **anti-Semitic** attitudes and the Holocaust, however, the soldiers' blind obedience to authority was a contributory factor.

To test the theory that ordinary people were capable of harming others on the orders of an authority figure, psychologist Stanley Milgram conducted a series of experiments. These experiments tell us a lot about the conditions under which we are more, or less, likely to obey.

Milgram's electric shock experiments

Milgram (1963) staged an obedience experiment, where participants thought they were taking part in a study of memory and learning. Participants were invited to Yale University and introduced to another participant, Mr Wallace, who was a confederate in the study. Participants watched as Mr Wallace was strapped to a chair and electrodes were placed on his arm in order to give him a shock. Each participant was asked to give Mr Wallace an increasingly higher level of electric shock if he failed to learn and remember word pairs that were read out to him. The shocks were not real, but the participant believed they were.

Mr Wallace was in a different room when he was given the electric shocks so the participant could not see him, but they could hear him protest at being shocked through a speaker. You might expect that the participant would stop shocking Mr Wallace when he began to shout out. However, an experimenter, Mr Williams, was in the same room as the participant and gave them instructions to continue.



Would you harm another person if you were asked to do so by an experimenter in a white lab coat?

Situational factors affecting obedience to an authority figure

- **Proximity of the victim** – Mr Wallace was in a different room, so it was easier for participants to obey the order to continue with the shock because the effects could not be seen. Mr Wallace was not proximate (near) to the participant. In a variation of the experiment, Mr Wallace was in the same room as the participant and obedience fell to 40 per cent. When asked to force Mr Wallace's hand onto a shock plate, it fell to 30 per cent.
- **Proximity of the authority figure** – when the experimenter (Mr Williams) was in the same room, 65 per cent of participants gave the highest level of shock. However, when Mr Williams gave instructions by telephone, this figure fell to 20.5 per cent.
- **Authority figure** – Mr Williams gave orders wearing a lab coat, so he looked official and legitimate. When Mr Williams was replaced by an ordinary member of the public, obedience fell to 20 per cent. This demonstrates that the level of authority affects whether or not we obey orders.
- **Legitimacy of the context** – the original study was conducted at the prestigious Yale University. When the study was replicated in a rundown office block, obedience fell to 47.5 per cent. Removing the prestige and legitimacy of the context lowered obedience.
- **Personal responsibility** – when the participant was instructed to work with another person who gave the shock, rather than them giving the shock themselves, obedience rose to over 90 per cent. They took less personal responsibility for shocking Mr Wallace as they did not have to press the switch themselves, so were more inclined to continue to follow orders.

Develop it

Milgram's (1963) obedience experiment is known as a classic study in psychology. You can learn all about it and watch original footage of the experiment on the internet. You will also find that Derren Brown has replicated the study for entertainment with similar results.

Under these conditions, Milgram found that 65 per cent of participants continued to give shocks to Mr Wallace to the highest level of 450 volts. Milgram believed that there were several features of the situation that could explain why most participants did this.

Social influence – How do others affect you?

- **Support of others** – as shown in bystander behaviour and conformity research, we tend to be influenced by the behaviour of others. Milgram placed two participant confederates alongside the genuine participant. One of these participants refused to continue at 150 volts, and the second refused at 210 volts. This seemed to offer social support for the genuine participant as there was a higher disobedience from the confederates. Only 10 per cent of participants continued to 450 volts.

Maths tip

You may be asked to perform maths calculations in your exam, so do not forget to take your calculator into the exam with you. It is important that you are familiar with different charts and how data can be presented so that you can interpret the findings accurately. Make a list of the charts you are expected to know and make a note of how each chart presents its data and the type of conclusions that can be drawn from them.

You will also be expected to make judgements about research studies and offer ways of improving them. To find improvements look at the methods and ethical issues of the studies. Use the popular acronym **GRAVE** to help identify a potential problem with a study that can then be used to suggest an improvement: **G**eneralisability, **R**eliability, **A**pplication of findings, **V**alidity, **E**thical issues.

Exam-style question

Leonard conducted a study to investigate whether the presence of an authority figure affected obedience levels. Participants were alone in a classroom and asked to complete a sheet of maths calculations. When they finished, they were asked to rip up the sheet and place it in the bin, then to continue with another sheet of calculations. The study lasted two hours, and the number of people who continued were recorded. In one condition of the experiment, an authority figure sat in the classroom with the participants. In a second condition, the authority figure gave them instructions and then left the room.

The results of the study are shown in Figure 5.2.

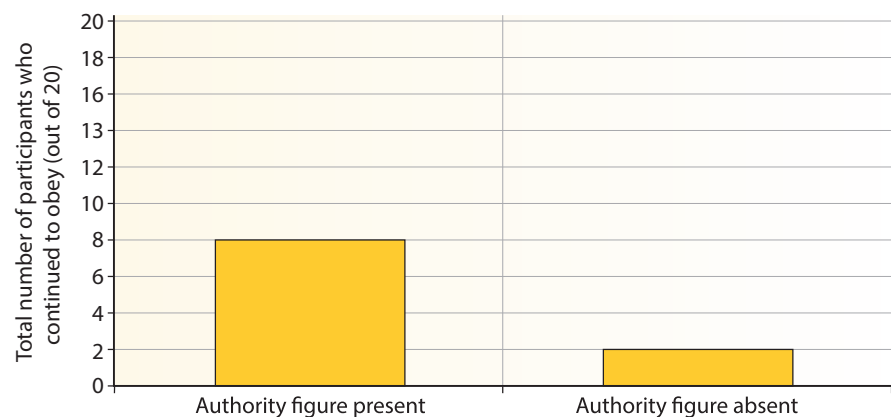


Figure 5.2 A bar chart to show obedience levels

- Calculate the percentage of participants who continued to obey when the authority figure was present. **(1 mark)**
- Explain **one** conclusion Leonard can make regarding the obedience of participants. **(2 marks)**
- Explain **one** way Leonard might improve his study. **(2 marks)**

Other factors that influence obedience

In addition to these situational factors, Milgram also believed that other features of the experiment could explain the high rates of obedience found in his study.

- Participants were told that the shocks were painful but not harmful, so they may have felt that the damage they were causing was not long-term.

- Participants were part of an important study and had volunteered to take part. This would have led to a sense of obligation to continue with the shocks for the sake of the study. Participants were also paid to take part and so this would have increased their feeling of obligation.
- The participants had not taken part in psychological research before, so would have little understanding of the procedures involved and their right to withdraw from the study. This would place them in an ambiguous situation, leading to greater compliance with the study.
- When we begin something, we feel obliged to see it through to the end. This is known as **momentum of compliance**. Pressing the next shock-generator switch only increased the shock level by a small amount (15 volts). This would have encouraged our momentum of compliance.

Apply it

Suki is conducting an obedience study. Participants are ordered to walk around a room and criticise people for not completing their jigsaw fast enough. They are ordered by a stern-looking teacher to continue to criticise and harass the people.

Using your knowledge of situational factors that influence obedience, explain the likely findings of Suki's experiment.

Personality factors affecting obedience

Some people are said to be more obedient than others because of their type of personality. Someone with an external locus of control is more likely to follow orders because they are affected by what other people tell them and take less personal responsibility for their own actions. Someone with an internal locus of control, on the other hand, is more likely to be self-directed and not follow the orders of an authority figure because they are more independent.

Link it up

Look back at *Conformity* to remind yourself about internal and external locus of control.

Authoritarian personality

Another personality factor that may influence obedience is the **authoritarian personality**. Someone with an authoritarian character tends to be respectful of authority, so is more likely to follow orders.

The concept of the authoritarian personality came from research by Theodor Adorno et al. (1950). Adorno was attempting to explain the level of anti-Semitism and racism demonstrated by the Nazis during the Second World War. He believed that some people were more inclined to hold anti-Semitic attitudes than others, and that this type of person would display the following characteristics:

- respect for authority figures
- rigid beliefs and attitudes
- a strong belief in justice
- right-wing politics
- aggressive to those inferior to themselves.

Adorno developed a questionnaire called the **F-Scale** to test whether someone had an authoritarian personality. Milgram used this questionnaire in an obedience experiment to understand whether the obedient participants had an authoritarian personality and compared them to the disobedient participants. There were 40 participants tested using the F-scale. The 20 obedient participants gained higher F-scale scores than the 20 disobedient participants. Milgram concluded that the level of obedience from different participants could have been caused by their personalities.

Key terms

Momentum of compliance: when we start something we feel compelled to finish it.

Authoritarian personality: a type of personality that is respectful of authority, right-wing in attitude and rigid in beliefs.

F-Scale: a questionnaire designed to identify authoritarian personalities or traits.

Social influence – How do others affect you?

Understanding the behaviour of crowds

What you will learn

- Crowd behaviour and the behaviour of individuals within crowds.
- Prosocial and antisocial behaviour of crowds.



Why are some crowds peaceful and some anti-social?

Key terms

Prosocial behaviour: behaviour that is seen as helpful, kind, co-operative and peaceful.

Antisocial behaviour: behaviour that is unhelpful, destructive and aggressive.

There are many different types of crowd; some are peaceful and some are destructive. Peaceful crowds can be found at festivals, concerts and sporting events – even protests can be peaceful. In such cases, crowds can show **prosocial behaviour**. However, some crowds can start off as, or develop into, mobs – from which rioting can arise. In this instance, the crowd can be described as showing **antisocial behaviour**.

Deindividuation and conformity

Crowd behaviour, whether peaceful or aggressive, can be understood in terms of deindividuation, as members lose their personal identity among others. Under these conditions, each member of a crowd is more likely to conform to the behaviour of the majority because they are no longer acting as an individual. Crowds seem to magnify levels of conformity because of this deindividuation of its members. This helps to explain why ordinary people, when in large crowds, sometimes cause criminal damage and get involved in fighting when they would not normally do if alone. However, if a crowd maintains peace, this can encourage every member to act in a prosocial manner.

Other researchers argue that rather than a loss of personal identity where we feel anonymous within a crowd, we in fact tend to form a new identity within a crowd. This new identity is bound up in the norms of the group. For example, if you went to an animal rights protest against vivisection, you may become a member of the crowd and your views might become as strong as the rest of the group's. Rather than become anonymous, we conform to the group norms.

Obedience

Within a crowd, an authority figure can exert an influence over others. This is particularly true if the authority figure is close to the crowd members and has greater power. Remember, Milgram's obedience study found that proximity, legitimacy and power of the authority figure showed higher levels of obedience. So, it may be true that this could also happen within a crowd. The intentions of the authority figure may be prosocial or antisocial. The crowd can therefore be directed to be peaceful or aggressive.

Apply it

Bessie conducted an experiment to investigate crowd behaviour. She asked individuals and small and large groups of people to decide how much hot sauce to give another person. The hot sauce was painful to taste. The results of her investigation are shown in Table 5.1.

Type of grouping	Amount of hot sauce
Individual	10 mls
Small group of 3	20 mls
Large group of 10	35 mls

Table 5.1 The amount of hot sauce decided on by each type of grouping

Using your knowledge of obedience and conformity in understanding antisocial behaviour of crowds, explain Bessie's results.

Develop it

The behaviour of an individual changes when they are with others in a group or crowd. Later you will read about deindividuation in the Stanford Prison Study by Haney, Banks and Zimbardo (1973). You can also read about this classic study online. Conduct an Internet search and see if you are able to identify factors that could have encouraged the prisoners and guards to become deindividuated.

Social influence – How do others affect you?

Understand ways to prevent blind obedience to authority figures

What you will learn

The possible ways to prevent blind obedience to authority figures.

Milgram's research into obedience not only tells us when we are more likely to obey an authority figure, it also tells us when we are less likely to obey. In order to prevent blind obedience to authority, it is important to understand these factors and use this knowledge in society.

Social support

One of the situational factors that lowered obedience in Milgram's research was the presence of a dissenting ally. When we are with others who resist obedience, we are more likely to follow suit. This can be important in everyday life as we are able to look to others for support if we are uncertain that an order from an authority figure is appropriate. In some organisations, staff are provided with staff mentors. Staff can then talk to them if they are asked to do something they would not choose to do themselves.

This was demonstrated in a series of experiments that investigated nurses' obedience to a doctor. Hofling et al. (1966) demonstrated how a doctor could order a nurse to give an overdose of a drug to a patient without an authorising prescription signature. Rank and Jacobson (1977) replicated this study, allowing the nurse to discuss the doctor's order with another nurse. They found significantly less obedience when the nurse found support from a colleague.

Develop it

Find out more about the study by Hofling et al. (1966) and Rank and Jacobson (1977) on the internet. Both studies tell us more about the conditions under which we are more or less likely to obey.

Familiarity of the situation

We also know that when we are in a situation that is unfamiliar or ambiguous, we are more likely to follow orders because we do not know how to behave. The nurses in Hofling et al.'s (1966) study were asked to administer a drug that they were unfamiliar with, whereas the drug used in Rank and Jacobson's (1977) study was well known to nurses. If we have information and knowledge about a situation, we are less likely to look to others or follow orders. Nurses are now given information on these obedience studies in order to encourage them to question authority if they feel the order they have been given is wrong.

Distance

Milgram demonstrated that the proximity of the authority figure was central to achieving obedience. If we increase the distance between ourselves and an authority figure, their impact is lessened. This means that we can be taught to walk away from a situation that we are uncomfortable with, meaning we would be less likely to blindly obey.

Education

Now that we are familiar with Milgram's research, we know that it can help us identify and resist blind obedience in the future. Education about the dangers of blind obedience is key to resisting it as it can give us insight into our own behaviour. Organisations may use education programmes and policies to help support employees who believe they need to question authority.

Apply it

Although aeroplane accidents are relatively uncommon, a review of accidents over a 10-year period found that the first officer not being willing to question a decision made by the captain contributed to more than 20 per cent of the accidents.

Using your knowledge of ways of preventing blind obedience, explain how these accidents could be prevented in the future.

Studies

Piliavin et al. (1969) Good Samaritanism: An Underground Phenomenon?

What you will learn

- Background to the study.
- Aims, procedure, results and conclusion.
- Strengths and weaknesses.

Background to the study

Irving Piliavin, Judith Rodin and Jane Piliavin conducted a **field experiment** to investigate bystander behaviour. They were particularly interested in the variables that affect whether people help someone in need. Their research came about following a murder in Queens, New York. Kitty Genovese was attacked and fatally wounded by a man who repeatedly returned to stab her as she walked to her apartment block. Despite her cries for help, onlookers failed to intervene to help her. Piliavin et al. wanted to investigate why people would fail to be 'good Samaritans'.

Aims

To investigate helping behaviour in a natural environment and understand the conditions in which people are more likely to help.

Procedure

Almost 4500 men and women passengers travelling on a New York subway between 11 a.m. and 3 p.m. became the participants in this **covert observation**. Four groups of four students from Columbia University were used to run the trials to observe what would happen when a victim collapsed on the train.

Each student group consisted of two male actors and two female observers. One male acted as the victim and the other male was a model (pretend passenger).

Figure 5.3 A diagram of the subway carriage where observers recorded the behaviour of the passengers

Key terms

Field experiment: a procedure staged in a naturalistic environment.

Covert observation: participants are unaware that they are being observed.

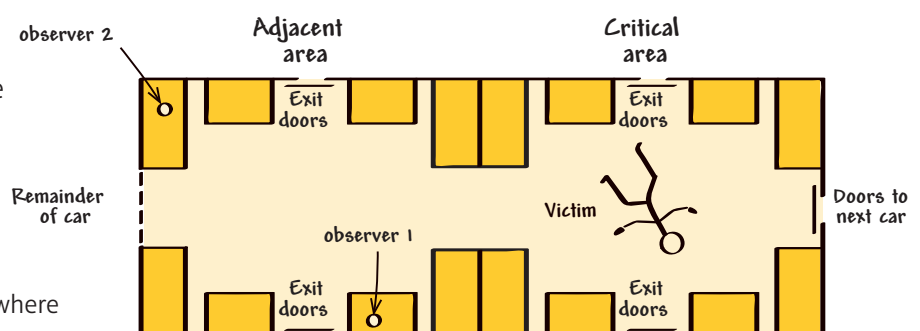
Link it up

For more information on the field experimental method and covert experimental design, see Topic 11 *Research methods*.

The victim entered the carriage of the train and stood next to the central aisle handrail. The model sat in the same area of the carriage and either sat still or offered to help the victim after a period of time. This became known as the critical area. Two female students entered the same carriage using different doors and sat in the adjacent seating area to observe and record what the passengers did (Figure 5.3).

After the first station stop, the victim stumbled forward and collapsed on the floor of the critical area. The female observers recorded how many people were in both the critical and adjacent areas, their race, sex, who helped and how long it took them to offer assistance.

Over 103 trials, the victim was either sober and carrying a cane or appeared drunk and carrying a bottle wrapped in a brown paper bag. The victims also varied as to whether they were white or black. Each victim was instructed to collapse and stare at the ceiling of the carriage until assistance came. The time it took for assistance to arrive also varied, as the model did not always offer help. Other times they would offer help after the fourth station stop (around 70 seconds after the staged collapse) or the sixth station stop (around 150 seconds after the staged collapse). The model was originally positioned either in the critical or adjacent area.



Social influence – How do others affect you?

Results

In 62 out of 65 trials where the victim was carrying a cane, passengers helped the victim before the model planned to intervene. This was compared to 19 out of 38 trials where passengers helped the drunk victim before the model planned to intervene. This meant that in 81 out of 103 trials, the victim was helped before the model was scheduled to help. Furthermore, in 60 per cent of these trials, more than one passenger came to the aid of the victim.

Other interesting findings emerged from the observations. They found that men were more likely to be the first ones to help the victim; in fact, 90 per cent of the first helpers were males. Also, 64 per cent of the first people to help were white. This being said, this percentage did not differ that much from the race distribution of the carriages, which were 55 per cent white. However, they found that 68 per cent of helpers who came to the aid of a white victim were also white compared to just 50 per cent of white passengers who came to the aid of the black victim.

Race also seemed to have an effect when it came to whether the victim was drunk. There was a tendency for the same race to help the drunk victim.

Other studies have shown that bystander behaviour is influenced by the number of people in a group. People tend to diffuse responsibility onto others if the group is large, feeling that others will help instead. However, this effect was not found in this experiment. In fact, the speed at which passengers helped was greater in groups of seven or more passengers than in groups of three to four passengers.

Link it up

Look back at the section *Bystander intervention* to remind yourself about 'diffusion of responsibility'.

Conclusions

Piliavin et al. drew a number of conclusions from their study.

- People are more likely to help someone perceived as ill compared to someone perceived as drunk. They suggest that this is because the cost of helping an ill person is less, in terms of risk to oneself, and there is a perception that drunk people are more responsible for their unfortunate situation than someone who is ill.
- Men are more likely to help than women. Women might feel that the costs of helping are higher for them. Also that the costs of not helping are less than they are for men as women are not expected to respond in such emergency situations.
- There is a small tendency for 'same race' helping, particularly when the victim is drunk.
- Larger groups are more likely to offer assistance than small groups.
- People in this study were less likely to see the situation as ambiguous: clearly the victim needed help. The cost of helping in a large group was comparatively low, as the victim would be perceived as less harmful. In addition to this, the cost of not helping was high because they could be clearly seen by others as not offering assistance and may have felt guilty. Although most helpers acted before the model was scheduled to intervene, the overall findings were that the model's offer of assistance did not tend to influence other passengers. The longer the time lapse before the model helped, the greater the likelihood that passengers discussed the situation or left the critical area.

Apply it

A man was observed to stumble and fall over in a busy shopping area. Using your knowledge of Piliavin et al.'s (1969) study, explain the conditions under which bystanders would be more likely to help the man.

Strengths and weaknesses of the study

The field experiment was conducted on a busy subway. Unlike many laboratory experiments on bystander behaviour, this study was done in a naturalistic environment on passengers who regularly use the subway to commute. This means that the study has **ecological validity** as the passengers would be behaving naturally and spontaneously. Therefore, a strength of the study is that the findings can be said to be true of normal bystander behaviour in such a situation.

A weakness of the study is that the passengers were unaware that they were being observed or taking part in a psychology experiment. This means that they had not given their consent to take part and may not have chosen to do so had they been asked beforehand. It is also a weakness that the situation could have caused distress to the participants. They would have been witness to an upsetting situation and so could have felt pressure to offer help or guilt for not helping the victim.

Despite the ethical considerations, covert investigations do have their benefits: the participants were unaware of being observed and therefore would have acted naturally. If the participants were aware they were taking part in a study they would have been more likely to help the victim, not because they are helpful but because they would feel it was expected of them. As the participants were not aware, they would not be displaying **demand characteristics**, which would have ruined the findings of the study.

Key terms

Ecological validity: the extent to which the findings still explain the behaviour in different situations.

Demand characteristics: when the behaviour of participants changes because they derive cues from the experimenter about the nature of the study and conform to those expectations.

Sum it up

The Good Samaritanism study is useful because it shows us how we might behave under naturalistic conditions. Unlike much of our understanding of bystander behaviour, this study depicts a more positive picture of helping behaviour because many participants did choose to help. However, the ethical issues associated with the research mean that participants could have been distressed by the situation they were placed in. Sometimes it is necessary to conduct unethical research, such as this study, in order to understand how people behave under normal conditions.

Link it up

Find out more about ethics and the issues associated with field experiments in Topic 11 *Research methods*.

Apply it

Lysander and Ellie wanted to conduct a field experiment to investigate bystander behaviour. They asked their teacher if they could stage someone collapsing in a busy airport and observe the reactions of people in the area. The teacher rejected their proposal.

Using your knowledge of Piliavin et al.'s (1969) study, explain possible reasons why the teacher rejected Lysander and Ellie's proposal.

Social influence – How do others affect you?

Haney, Banks and Zimbardo (1973) A Study of Prisoners and Guards in a Simulated Prison

What you will learn

- Background to the study.
- Aims, procedure, results and conclusion.
- Strengths and weaknesses.

Develop it

Steve Reicher and Alex Haslam recreated the simulated prison study in 2002. You can read all about the BBC Prison Study on the internet. Watch footage of the prisoners and guards and compare their procedures and findings to this study. The Stanford Prison Experiment has also inspired a film, depicting the experiences of the guards and prisoners.

Background to the study

Craig Haney, Curtis Banks and Philip Zimbardo set up a mock prison in order to investigate the conditions under which people become aggressive. They observed that prisons in the US were riddled with conflict and wanted to understand how the conflict between guards and prisoners arose. The Navy funded the research because they also wanted to understand the high levels of aggression in naval prisons.

At the time, the main explanation for conflict in prisons was centred on blaming the prisoners for being evil people. Prisoners were seen as aggressive types that were naturally disposed to violence. Others disagreed with this explanation and suggested that the close contact between prisoners and guards created a situation where conflict could arise.

Aim

To investigate prisoner–guard conflict in a simulated prison environment.

Procedure

An advert was placed in a newspaper asking for volunteers to take part in a study of prison life. From 75 respondents, 22 participants were selected to take part in the experiment. One dropped out, leaving 10 prisoners and 11 guards who were randomly assigned to the two roles. All participants were male college students assessed as psychologically healthy. Each was paid \$15 a day for their participation.

A simulated prison was set up in the basement of Stanford University, consisting of three cells with steel bar doors, a yard area, a guardroom and a closet for solitary confinement. There was also a room with video recording equipment to record transactions between the participants throughout the proposed 2-week experiment.

The guards were briefed before the experiment and asked to maintain order in the prison. However, they were not given exact instructions on how to behave. They were dressed in military-style uniforms and given batons.



If you were assigned as a guard, how would you behave towards the prisoners?

The prisoners were arrested by real officers from the Palo Alto City Police Department at their homes and charged on suspicion of burglary or armed robbery. They were handcuffed, searched and taken to the police station to be processed. The prisoners were then blindfolded and driven to Stanford University where they were stripped and deloused. Each prisoner was given a muslin smock to wear, labelled with their prisoner identification number; they were referred to by this number for the duration of the study.

The prisoners spent a lot of time in their cells, but were allowed privileges, such as watching a movie and visits from their family. Three guards worked 8-hour shifts and conducted a 'prisoner count' at the start of every shift, lining up the prisoners who then recited their identification number.

Results

After only a few hours, the guards were observed to become increasingly aggressive and controlling towards the prisoners. This increased throughout the study, and prisoners were punished with push-ups and solitary confinement and verbally assaulted. On the second day, the prisoners rebelled by barricading themselves in their cells. This was soon quashed by the guards who used a fire extinguisher to break into the cells and then placed the ringleaders into solitary confinement.

Over the course of the next few days, the guards increasingly intimidated the prisoners and there was an escalation in verbal aggression and punishment. Individual differences were apparent, as some prisoners were passive while others were actively rebellious. There were also differences in the guards: some instigated aggression while others were more reluctant to engage in conflict.

The study was prematurely stopped after just 6 days because the behaviour of the prisoners and the guards was getting out of control. Many of the prisoners were displaying signs of anxiety and depression and were desperate to leave the study.

Conclusions

It was clear that both the prisoners and the guards conformed to the role that they had been assigned. The prisoners became submissive and passive, the guards aggressive and hostile. The uniforms deindividuated them, facilitating this change in behaviour; they lost their personal identity and adopted the identities they were given. The prisoners in particular were stripped of their personal identity. They were never referred to by name, only by identification number. They were humiliated and broken down through menial tasks and punishments. Both prisoners and guards were immersed in the simulated prison environment.

Develop it

Find out more about the individual prisoners and what happened to them by conducting an internet search on the Stanford Prison Study. List the tactics used to deindividuate the prisoners and the guards.

Social influence – How do others affect you?

Strengths and weaknesses of the study

A weakness of this study is that distress was caused to the 'prisoners'. They were subjected to physical and psychological harm at the hands of the 'guards'. One participant was removed from the prison after just 35 hours because they were so emotionally distressed. The study was stopped after 6 days because the behaviour of the participants was clearly getting out of hand. However, each participant was fully debriefed and given psychological evaluations after the study to ensure their well-being.

The simulated prison study was designed to emulate the conditions of a real prison, but for ethical reasons rules were in place to prevent physical abuse and other common experiences that occur in real prisons. A clear difference between a real prison and this simulation is that the prisoners and guards knew that it was a simulation and that they would only be imprisoned for a maximum of 2 weeks. Both the prisoners and guards could have simply been acting in a way they thought was expected of them rather than demonstrating real behaviour in the situation. This lowers the ecological validity of the study.

Despite this weakness, there is evidence to indicate that the prisoners and guards were not acting. The recordings made of their transactions showed that most of the time the prisoners talked about prison life rather than their personal lives. This shows that they were becoming immersed in the situation rather than merely acting, so this is a strength of the study.

As the study was only conducted on male college students, it is difficult to apply the findings to real-life prison populations, which are more diverse. This limits the **generalisability** of the findings. However, it has informed the way in which prisons are run and can explain the atrocities that have occurred in prison situations.

Link it up

Find out more about ecological validity and generalisability in Topic 11 *Research methods*.

Key term

Generalisability: the extent to which the results of a study represent the whole population, not just the sample used.

Apply it

Darian was a supporter of his local football team. He liked to go to matches and took pride in wearing the team colours. One Saturday, he went to a local match with his friends. During the match, Darian and his friends started to pick fights with people in the stadium.

Using your knowledge of the Stanford Prison Experiment, explain Darian's behaviour.

Develop it

Philip Zimbardo was an expert witness for soldiers accused of atrocities committed against prisoners of war at Abu Ghraib prison in Iraq. Use the internet to find out more about what happened at Abu Ghraib, although you should be aware that many of the atrocities committed were very distressing. Consider the similarities between Abu Ghraib and the Stanford Prison Experiment.

Sum it up

The Stanford Prison Experiment is a classic study in psychology because it revealed the conditions under which conflict can arise through deindividuation and conformity to social roles. This has been invaluable for understanding real-life atrocities under similar conditions. However, it has been accused of being unrealistic, as the participants could simply have been acting the part. The researchers have also been heavily criticised for not recognising early enough the harm that was being caused to the young men involved.

Issues and debates

Social and cultural issues in psychology

What you will learn

- The meaning of social and cultural issues in psychology.
- Concepts, theories and research used to explain social and cultural issues in psychology.

Social issues in psychology

Society refers to a group of people living together in a large group. Social psychology investigates how these groups exert an influence on our behaviour. A **social issue** is a problem or situation of conflict within a society. One of the most widely researched social issues occurred during the Nazi regime in Germany during the Second World War. Anti-Semitism was a social issue that involved prejudice, discrimination and persecution of the Jewish population. Rioting can also be seen as a social issue because it involves members of a social group.

Obedience

Milgram's research into obedience helps us to understand the atrocities committed against Jews by soldiers during the war because their behaviour could be partly explained by high levels of obedience to authority. Milgram helped us understand that the German soldiers were no different to anyone else, but that the situation they found themselves in determined their behaviour.

Conformity

Conformity can also help us understand social issues. In August 2011, riots occurred in London in reaction to the police shooting of Mark Duggan, and quickly escalated to other parts of England. Informational social influence can help us understand how people were unsure how to respond to the shooting and looked to others for information on how to behave. In a crowd, they would observe the other members being hostile, causing damage and looting, and internalise the norms of the group. Normative social influence can also explain that members of the crowd may have felt that they needed to fit in and so joined in with the rioting.

Key terms

Society: a group of people in a community.

Social issue: a social problem or conflict that affects a community of people.

Link it up

Look back at page 108 to remind yourself of Milgram's (1963) electric shock experiments.



Can social influence research help us understand the riots that occurred in the UK in 2011?

Develop it

Investigate the riots of 2011. Do an internet search on research carried out by Clifford Stott and Stephen Reicher on the UK riots.

Social influence – How do others affect you?

Deindividuation

Haney, Banks and Zimbardo's (1973) study showed us how our behaviour can change when we lose our personal identity (deindividuation). Deindividuation might help us understand the behaviour of the Nazi soldiers during the Second World War – as they wore uniforms they were anonymised as individuals. Research has demonstrated that we become more aggressive with loss of personal identity, which may explain the soldiers' aggression towards Jews. We also know that larger groups are more likely to become deindividuated and therefore more aggressive if the group norms are anti-social. As the riots grew in the UK, for example, aggression increased.

Bystander effect

German citizens could have failed to help Jewish people being persecuted during the Second World War because many other German people were not helping. Alternatively, they may have decided not to intervene because they diffused responsibility onto others. This pluralistic ignorance may have occurred because many German people did not comprehend the level of persecution the Jews experienced. German people may also have evaluated the cost of helping as too high, because it was likely that they would have been imprisoned or killed for helping the Jewish people.

Key terms

Culture: a set of traditions, beliefs and values shared by a group of people.

Individualistic culture: a culture that emphasises independence, autonomy and individuality.

Collectivistic culture: a culture that emphasises group membership, interdependence and cooperation.

Cultural issues in psychology

Culture refers to a set of beliefs, practices and traditions held by a large group of people. The greatest division between beliefs and traditions are held by:

- **individualistic cultures** – typically Western, emphasising independence, autonomy and individuality
- **collectivistic cultures** – typically Eastern, emphasising group membership, interdependence and cooperation.

Obedience

It could be suggested that individualistic cultures, which stress the role of the individual, equality and independence, are less likely to follow orders from an authority figure. Collectivistic cultures stress the importance of group goals and respect for authority, so its members are more likely to fall into line if ordered by an authority figure. However, as Milgram (1963) demonstrated, obedience is more a product of the situation we find ourselves in rather than the culture we come from.

Mitri Shanab and Khawla Yahya (1977) replicated Milgram's experiment in Jordan, a collectivistic culture, and found that 73 per cent of the participants gave the maximum level of shock. This may appear to be evidence that collectivistic cultures are more obedient, but as the participants were aged between 6 and 16 years old, it may show only that children are more obedient.

Conformity

Whether we see ourselves as individuals or as part of a group can affect whether or not we conform to group behaviour. Individualistic cultures are



Conformity can occur in many ways across different social groups and cultures – even in fashion and hairstyles

more likely to be non-conformist because individualism is not feared and there is less need to fit in. Collectivistic cultures emphasise group coherence and not being seen as distinct from others. Therefore, they are more likely to conform to the behaviour of the majority.

Rod Bond and Peter Smith (1996) demonstrated this in a study that replicated Asch's line judgement study across 17 different countries. They compared the findings and found that collectivistic cultures were more likely to conform to the group majority than individualistic cultures.

Deindividuation

Deindividuation is likely to occur across *all* cultures equally and the outcomes of deindividuation, whether peaceful or aggressive, are dependent on the norms that are established within a group. For example, warriors in tribal cultures that use face paint to disguise themselves are preparing themselves for warfare. The face paint deindividuates them, allowing them to be more aggressive. Similarly, Ku Klux Klan members disguise themselves in white robes when taking part in racist practices.

Bystander effect

Cultural differences in bystander behaviour are likely. Individualistic cultures do not form close social bonds within groups as there is no need to cooperate for collective goals. This may result in an indifference to others' suffering and more self-protecting behaviour. Collectivistic cultures have strong in-group favouritism as they are driven to cooperate together as a social group. Therefore, people in collectivist cultures are

strongly motivated to help members of their groups, such as their family or peers. However, they are less likely to help those they do not see as belonging to their group.

This in-group favouritism was demonstrated in Piliavin et al.'s (1969) study, which found a higher incidence of same-race helping, particularly when the victim was drunk, meaning the cost of helping was at its highest.

Exam-style question

Assess how culture influences group behaviour. Use concepts, theory and research from social influence in your answer. **(9 marks)**

Exam tip

'Group behaviour' is quite open and can refer to conformity, crowd behaviour and bystander effect, so there is plenty of scope to refer to different explanations and theories. Remember to present an idea and where possible 'assess' the research evidence or concept described. For this question, you will need to judge whether culture does actually have an influence on how we behave in groups, so a two-sided view would strengthen your answer.

Psychology in action

Millions of people use online social networking services to keep in touch with friends and family and to meet new people. For many of these services, we can be members of online groups. The internet can offer anonymity as other members or groups may never know who we actually are in real life. Such anonymity can result in deindividuation, where we become a part of a group and display more risky or aggressive behaviour. This online environment may lead us to become more aggressive towards other people and groups, leading to potential cyberbullying or harassment.

Cyberbullying is a huge problem for children and young adults who regularly use social media, and it has been linked to increased levels of mental health issues among young people. It is important that educators and families seek information about using social media responsibly to teach children how to avoid bullying or being bullied online.

Preparing for your exam 1

The Edexcel GCSE (9–1) Psychology consists of two externally examined papers. This section of the book has been designed to help you prepare for Paper 1.

Exam strategy

Planning revision

All exam preparation requires revision, and this takes effort and time, so be prepared by writing a revision timetable to help manage your time effectively. Find out when your exam is and how long you have to revise. Then you can look at how many topics you need to cover and break up the revision into manageable chunks. It is important to stick to the revision timetable in order to avoid cramming for the exams at the last minute. There are really useful revision timetable builders online that can help you with this process.

How will I be assessed?

GCSE Psychology is 100 per cent examination assessed; there is no coursework. You will have been given opportunities throughout your course to conduct practical investigations. Although these will not be directly assessed, they are important for developing methodological knowledge and psychological imagination in preparation for scenario-based exam questions. Topic 11 *Research methods* will mainly be examined in Paper 2, although some methods questions may also be found in Paper 1.

The examination is designed to test a range of skills that you have developed throughout the course, as well as the content you have learned. These are known as assessment objectives (or AOs).

AO1	<i>Demonstrate knowledge and understanding of psychological ideas, processes and procedures.</i> This skill may be tested in isolation with a straightforward ‘identify’ or ‘describe’ question. It can also be tested alongside a different assessment objective because underpinning knowledge and understanding is also demanded of other types of question (for example, ‘evaluate’ or ‘assess’ questions).
AO2	<i>Apply knowledge and understanding of psychological ideas, processes and procedures.</i> This can be demanded by questions that ask you to explain a novel situation using your underpinning psychological knowledge.
AO3	<i>Analyse and evaluate psychological information, ideas, processes and procedures to make judgements and draw conclusions.</i> This may ask you to analyse data and graphs or evaluate theories, concepts and research.

Table 1 Assessment objectives

Preparing for your exam 1

Paper 1 (1PS0/01)

Paper 1 is divided into six sections: A–F. The first five sections (A–E) ask questions on the compulsory Topics 1–5. Section F focuses on issues and debates and interrelationships between the core areas of psychology covered in your compulsory Topics 1–5.

The exam is 1 hour and 45 minutes and is out of 98 marks. The paper is worth 55 per cent of your final mark.

The assessment in sections A–E contain multiple-choice and short-answer questions worth between 1 and 4 marks each. Section F has two extended-response questions (essays) worth 9 marks each. They require you to ‘assess’ material that you are given. You will need to draw knowledge from across all the compulsory topics, either as a theme or as different ways of explaining a behaviour.

You should answer **ALL** the questions on Paper 1.

Question types and command words

There are a range of command words used in the exam, which each require a different skill base and approach to answering the question. You should try to make yourself familiar with all the command words and what they demand of your answer. A full list of command words and their definitions can be found in Appendix 1 of the specification.

Table 2 provides some examples of command words to consider. More words will be discussed in the exam preparation section for Paper 2.

Command word	Skill
Identify	Typically associated with multiple-choice or diagram identification questions. This command word requires that you are able to select key information from a stimulus or your knowledge base in order to answer the question.
Give/state/name	Draws upon your knowledge of psychological concepts, theory, research and methods. You are simply asked to recall the information you have learned that is appropriate for the question, using factual information.
Describe	Requires a response that needs to be developed, not just stated, but does not need a justification for your answer.
Identify, give/state/name and describe require a low level of skill, and will be typically found at the beginning of each section to slowly ease you into that section of the exam.	
Explain	<p>A commonly used command word that requires an explanation and reasoning or justification for your response. It is very important to provide a justification in your answer to access the marks available. ‘Explain’ questions are often linked to a stimulus or context that helps you draw out relevant information. They may also prompt you to use relevant psychological knowledge with the statement ‘You should refer to a theory/study in your answer’. They may also specify which theory/study to refer to, for example ‘You should refer to the Multi-store Model of Memory in your answer’.</p> <p>It is very important to practise ‘explain’ questions. You could try to remember to use the word ‘because’ to link two related points. Doing this will make it easier to make a point and then justify it appropriately.</p>

Table 2 Command words and how to tackle them

Sample questions and answers, Paper 1

1. Describe *two* features of short-term memory. (4 marks)

Exam tip

The command word 'describe' requires an answer that goes beyond identification of a feature. Some elaboration or development is needed to access the marks. There is no need to justify an answer and no

need to offer strengths or weaknesses. The number of marks and the number of lines that are available for the answer indicate the appropriate depth that it should be.

Student answer

One feature of short-term memory is that you can only store a certain amount of information.

Another feature of short-term memory is that encoding is acoustic.

Feedback/annotation

This answer does not go beyond identifying the two features of short-term memory. So, although the answer is correct, it needs further development.

The first part of the answer is limited in the use of cognitive terminology. The answer would be better if short-term memory's capacity was described as

limited. To develop this point, the answer should have specifically described what the capacity is.

The second part of the answer correctly uses key cognitive terminology, but again does not develop the point by explaining what acoustic encoding means.

Verdict

This is an average answer because it correctly identifies the appropriate features of short-term memory.

It could be improved by:

- using key terminology
- developing the answer fully to access all the available marks.

2. Tasie is a primary school teacher. For a physical education lesson, she divided her class into a blue team and a yellow team. She gave the children a yellow cap or a blue cap to wear to indicate which team they were playing on. During a game of rounders, she noticed that the teams were being unkind to each other. The next time she held a game of rounders, she did not use the coloured caps and mixed the teams up during the game. The children were no longer unkind to each other.

Explain why the children may have been unkind to each other when wearing coloured team caps during the first game of rounders and were not unkind in the next game.

You should refer to a study in your answer. (4 marks)

Preparing for your exam 1

Exam tip

This question will assess your ability to comprehend a given scenario and apply your understanding of the appropriate psychological content to explain it. It also requires that you refer to a specific psychological study relevant to the context in your answer.

For this type of question, remember to identify the psychological knowledge relevant to the context, refer to the context in your answer and write about the relevant aspects of a study that can be used to support your answer. Remember that your answer should 'explain' the context, not just describe the relevant psychological theory and study.

Student answer

The children may be showing unkind behaviour towards each other while wearing the coloured team caps because they identified with their team group. The coloured caps allowed them to lose their personal identity within the group. This loss of personal identity can encourage antisocial behaviour, which was directed at the other team. This can be seen in Haney et al.'s prison study, where the students dressed as guards. They became aggressive towards the prisoners when they wore their uniform because they lost their personal identity.

Feedback/annotation

This is a good answer because the student has explained why the children were initially unkind while wearing the team cap and has supported the answer with an appropriate study.

The answer could be slightly improved by using the key term 'deindividuation' to clearly link the explanation to a psychological concept that explains the context. It could also have gone a little further

to explain that deindividuation causes aggression because being anonymous disinhibits us.

When referring to a study or theory in an answer, it is not appropriate to describe the whole theory or study. You only need the relevant concepts/parts that are applicable to the context of the question. Here the answer just refers to the uniform causing aggression, which is appropriate to the context.

Verdict

This is a clear explanation because:

- it uses appropriate psychology, which is relevant to the scenario
- it refers to a relevant study and only describes the relevant aspects of the study.

It could be improved by:

- using psychological terminology within the answer.

3. *You can often find arcades with various penny slot machines and games at the seaside. A psychologist was interested in arcade behaviour, so decided to conduct an observation of families using the arcade. The psychologist noticed that children were displaying signs of addictive behaviour while playing the arcade games, particularly the penny slot machines. When the families were leaving the arcade, the psychologist noticed that children often cried and protested to their parents.*

Explain why children may become addicted to the arcade games.

You should refer to a learning theory in your answer. (2 marks)

Preparing for your exam 1

Exam tip

This type of question requires explanation, so avoid general description. You should consider what relevant psychological knowledge links to the

scenario. You also need to refer to a specific learning theory, so ensure that you only comment on relevant aspects of the theory that link to the scenario.

Student answer

The children may find the arcade games rewarding or exciting, which may act as reinforcement to stay in the arcade and play the games. Operant conditioning explains that reinforcement can make us repeat a behaviour.

Feedback/annotation

This answer clearly explains the context of the question, but should have made specific reference to 'positive reinforcement' to be more accurate.

The answer correctly identifies the appropriate learning theory and uses it effectively, but the student could have

made specific reference to the type of reinforcement experienced by the children in the arcade.

Other learning theories that could have been relevant are classical conditioning and social learning theory.

Verdict

This is an average answer. It does not make effective use of specific aspects of learning theory.

It could be improved by:

- being more accurate in the use of psychological terminology to show better understanding
- more clearly linking the theory to the scenario.

4. Unipolar depression is one of the most common mental health problems experienced. Jean was diagnosed with depression because she felt very low in mood and lacked energy and motivation. Her doctor explained that her depression could have been inherited through her family as her father also suffered from episodes of depression. However, Jean did not agree with her doctor and believed that her depression was due to recently losing her job.

Assess how far nature and nurture would account for Jean's depression. (9 marks)

Exam tip

This question requires an answer that meets all three assessment objectives. There should be knowledge and understanding of how nature and nurture might explain mental health problems. It

also requires application of knowledge to Jean's situation. Finally, there need to be judgements formed about whether nature and nurture could account for Jean's depression.

Preparing for your exam 1

Student answer

Nature can explain mental health problems, such as unipolar depression, through genetics. Genes are inherited, which means they are passed down through families. The closer the degree of relative, the greater the likelihood of inheriting a mental health problem because you have more shared genes. Nature might explain Jean's depression because her father also suffered from depression and he is a first-degree relative. He may have passed the gene for depression on to her. Her doctor might have favoured this explanation because it is a biological one.

Nurture explains that mental health problems arise from environmental conditions. Something may happen to a person that causes depression to develop. This might be an experience that Jean has, such as the loss of her job. Losing a job can result in the loss of friends and a lack of activity and focus. This can mean that Jean feels lonely and lacking in self-worth, which might lead to depression.

There is evidence that depression is inherited. Gershon (1990) conducted a review of ten family studies and found that there was a range of concordance rates between 7 and 30 per cent among first-degree relatives for depression. Although this might demonstrate that depression is inherited, it may also be due to sharing a similar environment. It is possible that Jean inherited depression from her father, but she also shared the same environment as him when growing up.

The problem with nature as an explanation for depression is that it is reductionist, and therefore ignores other influences that may cause depression to occur, such as those explained by nurture.

There is evidence that major life events, such as the loss of a job, can be associated with depression. Ellis explains that an activating event, such as the loss of Jean's job, may cause an irrational belief that she is worthless. This irrational thought might lead to symptoms of depression.

Life events, such as bereavement and loss of employment, can trigger the onset of depression. It is known that major life events that are stressful or negative are associated with a greater risk of depression.

Nature cannot explain why not all family members will go on to develop depression if they have close relatives with the disorder. It may be that we inherit a genetic vulnerability from our family that is then triggered by our environment, activating that vulnerability. Therefore, it is more likely that an interaction between nature and nurture better explains Jean's depression.

Feedback/annotation

This is a high-level response that meets all three assessment objectives – the knowledge and understanding of causes of depression are clear and appropriately linked to the context of Jean's depression.

There is sustained linkage to Jean's depression throughout, and appropriate aspects of the context are used in the answer. There are balanced judgements made and evidence offered for both nature and nurture.

The final judgement is appropriate to our current understanding of the nature–nurture debate. There are many more points and pieces of evidence that could be offered, but within the time constraints of the exam, there is enough information here to fully answer the question.

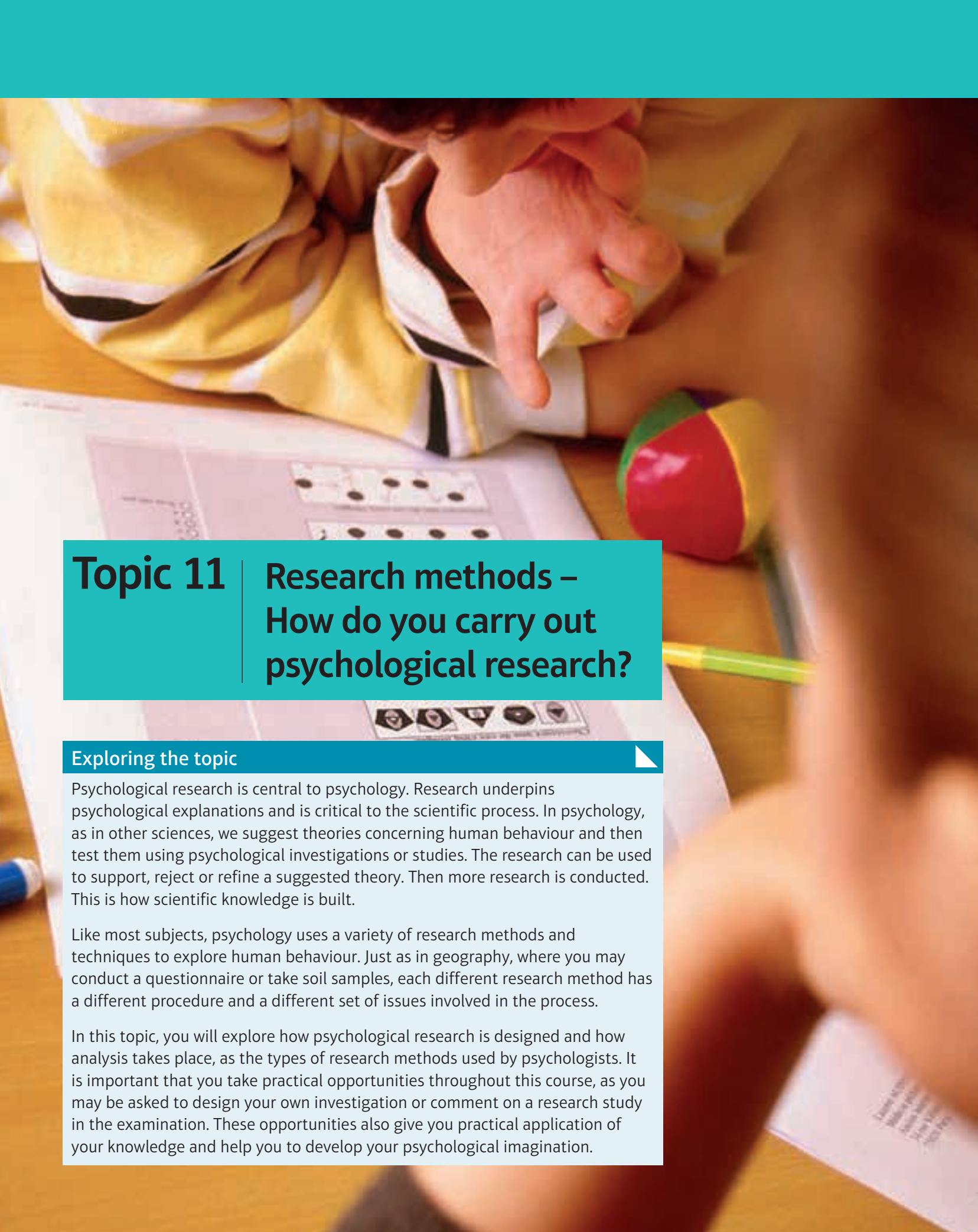
Verdict

The answer is good because:

- knowledge and understanding of the nature–nurture debate is relevant and clear
- there is a sustained attempt to relate the answer to the context
- judgements are well formed and evidence is offered
- the whole essay is well constructed and formulates a balanced and reasoned judgement.

The answer could be improved by:

- giving evidence for the role of nurture in the onset of depression.

A child wearing a yellow shirt is sitting at a wooden table, pointing their right index finger at a worksheet. The worksheet has a section with two rows of dots for a dot-marker activity. To the right of the worksheet is a colorful ball with red, yellow, and green segments. The background is a solid teal color.

Topic 11 | Research methods – How do you carry out psychological research?

Exploring the topic

Psychological research is central to psychology. Research underpins psychological explanations and is critical to the scientific process. In psychology, as in other sciences, we suggest theories concerning human behaviour and then test them using psychological investigations or studies. The research can be used to support, reject or refine a suggested theory. Then more research is conducted. This is how scientific knowledge is built.

Like most subjects, psychology uses a variety of research methods and techniques to explore human behaviour. Just as in geography, where you may conduct a questionnaire or take soil samples, each different research method has a different procedure and a different set of issues involved in the process.

In this topic, you will explore how psychological research is designed and how analysis takes place, as the types of research methods used by psychologists. It is important that you take practical opportunities throughout this course, as you may be asked to design your own investigation or comment on a research study in the examination. These opportunities also give you practical application of your knowledge and help you to develop your psychological imagination.

Your learning

In this topic you will learn about:

- designing psychological research to set up the variables under investigation
- identifying and controlling unwanted variables
- the different types of hypothesis for investigations and how to write them
- the different sampling methods
- the different types of research and experimental designs
- issues of reliability and validity when analysing research procedures
- ethical issues and how to deal with them
- the different research methods used by psychologists
- data analysis including arithmetic and numerical computation
- the use of descriptive statistics
- the use of graphs to illustrate data
- the differences between primary and secondary data
- the differences between qualitative and quantitative data
- ethical issues associated with psychological research.

Getting started

Get started on this topic by thinking about the ways in which you have ‘tried it’ during your study of the topics so far. You may have designed a questionnaire or observation or designed an experiment and tested participants in an investigation.

Open a newspaper or look at an article online. Think about how you would test ideas that are being claimed in the media. You may find that a newspaper makes a claim that ‘eating celery improves well-being and extends your life’. Consider how you would go about testing this claim. How would you design your study? Who would you test? What issues might you need to resolve?



Research can be carried out in many different ways, from designing a questionnaire or observation to testing participants in an experiment.

Designing psychological research

What you will learn

- How to identify the independent, dependent and extraneous variables of an investigation.
- The influence of extraneous variables and possible ways to control them.

Key terms

Independent variable (IV): the variable directly manipulated by the researcher.

Dependent variable (DV): the variable being measured in a study.

Operationalisation: making the variables in an investigation detailed and specific.

Extraneous variable: a variable that is not controlled, which could affect the results of a study.

Confounding variable: an extraneous variable that affects the results of the study so that the effect of the IV is not truly being seen.

Independent and dependent variables

An **independent variable (IV)** is the variable (factor) in research that is directly manipulated by the researcher in order to examine its effect. The IV can have two or more levels, which are seen in the conditions (parts) of an investigation. For example, if you are examining the influence of caffeine on performance, the IV is caffeine and the researcher may alter the levels given to participants. In one condition of the investigation, participants may be given 1 mg of caffeine and in the second, 2 mg of caffeine. To identify the IV of an investigation, you need to look at the factor being altered between the conditions of the study.

A **dependent variable (DV)** is the variable that is being measured by the researcher. The DV should be affected by the manipulation of the IV, so it is the outcome of the study. To identify the DV, you should look for the variable that is being measured in the investigation. For example, if the IV is the level of caffeine, the DV could be a person's work performance. Performance should change as a result of different levels of caffeine.

It is important that both the IV and DV are **operationalised**, so that they are testable and measureable. When we operationalise variables, we make them specific and detailed so that another researcher can know what was measured and changed, and how.

Apply it

Identify the independent and dependent variables in the following investigations:

- a study to investigate whether cats or dogs sleep longer
- a study to see if age affects the amount of sleep we need
- an investigation into how the type of praise you receive influences grades achieved in exams.

Understanding the influence of extraneous variables

Extraneous variables are factors in an investigation that may interfere with the IV or DV and affect the findings of the study. Extraneous variables may be associated with the situational conditions of the study or the participants involved in the study, and they need to be controlled to prevent them from affecting the outcome of a study. If an extraneous variable is not controlled, and so has an effect on the outcome, it is known as a **confounding variable**. This is because it confounds (damages) the results.

Link it up

The influence of extraneous variables is discussed in relation to studies in Topic 2 *Memory*, Topic 4 *The brain and neuropsychology* and Topic 7 *The self*.

Situational variables

Situational variables are present in the environment of the investigation, and typically include noise, distractions, light levels and temperature. These variables can influence the outcome of a study if they vary between conditions. For example, if one group of participants is trying to perform a written task in poor light, their ability may be worse than a group who performs the same written task with good lighting conditions.

How the study was conducted (the procedure) can introduce situational variables. If a study requires participants to repeat a test, this can cause problems. For example, participants may improve just because they have repeated the test, or they may become tired or bored, and so do less well. This is known as **order effects**. Participants may also change their behaviour to meet the perceived aims of the study, which are known as **demand characteristics**. **Investigator effects** can also encourage demand characteristics. This is when a researcher unintentionally gives participants clues about how to behave, for example they may nod when a participant gives a correct answer.

Participant variables

Participant variables are associated with the participants involved in an investigation. Participants bring with them various abilities, attributes and tendencies that can influence the outcome of the results, particularly if a certain type of participant is found in one condition of the study and not the other.

Participant variables can include personality type, physical ability, substance tolerance, memory ability, life experiences, mood, upbringing and many others. The researcher only needs to consider what participant variables are likely to influence the findings of their study. For example, driving ability is unlikely to influence the outcome of a short-term memory experiment.

Controlling extraneous variables

Researchers can either eliminate or control extraneous variables. Eliminating extraneous variables involves removing the likelihood of them occurring, such as placing a 'silence' sign outside the experimental room to prevent distractions. Many extraneous variables cannot be eliminated, but they can be controlled.

Controlling situational variables

One way to control situational variables across the conditions of an investigation is to use a **standardised procedure**. This involves keeping the situation and procedure exactly the same across all conditions of an investigation. So if the noise is at a certain level for one condition, it should be exactly the same for the other conditions of the study.

Apply it

Identify the potential situational and participant variables that may influence the findings of the following investigation.

Researchers posted a notice on a social media site to recruit volunteer participants for an investigation. The investigation wanted to see whether or not people select partners who are similar to themselves. Once they were recruited, they were invited to a university laboratory and asked to select their ideal partner from a series of photographs and descriptions. The researchers wanted to see if males or females were more likely to select people who were similar to themselves as ideal partners. The participants came to the laboratory on different days and were tested by a variety of male and female researchers.

Key terms

Situational variable: an extraneous variable present in the environment of the study.

Order effects: when participants improve or worsen in the second condition because they have practised or become fatigued.

Demand characteristics: when the participant alters their behaviour in response to the perceived aims of the investigation.

Investigator effect: when a researcher unintentionally gives clues to participants, altering their behaviour.

Participant variables: extraneous variables specific to the participants of an investigation, for example their mood, ability or personality.

Standardised procedure: where the procedure of a study is the same across all conditions.

Research methods – How do you carry out psychological research?

To prevent order effects from occurring, researchers can use a technique called **counterbalancing**. Counterbalancing involves half of the participants experiencing the first condition and then the second condition; the remaining half experience the second condition before the first condition of the study. In this way, the order effects of either improvement or decline in performance are equally distributed in both conditions to cancel each other out.

Order effects can also be controlled by **randomisation**. This is based on the same principle as counterbalancing, but each participant is assigned to the first or second condition as a matter of chance. For example, they could pick the first or second condition from a hat, or a computer could randomly generate the condition order.

A **single-blind technique** can control demand characteristics (when participants change their behaviour). This means that participants are blind to the aims or expectations of the study and certain information about the procedure is withheld. This technique is often used in clinical psychology, where clinical trials involve giving medication. In a single-blind clinical trial, a participant will not know whether they are given the actual medication or an inactive substance (placebo).

Develop it

Conduct an internet search on a horse called Clever Hans. Identify the demand characteristics involved and suggest how you would design a better test of Clever Hans's counting ability.

The **double-blind technique** can be used to control demand characteristics encouraged by investigator effects. This technique means that neither the participants nor the researchers involved in data collection, or interaction with participants, know the aims of the study. Often an independent researcher is employed to conduct the research.

Controlling participant variables

One way to control participant variables is to use the same participants in both conditions of the study, so the data for each participant can be compared across both conditions. Another way of controlling participant

variables is to use different participants but make sure they are matched on important characteristics.

Random allocation of participants can also be used to control participant variables. This involves participants being randomly assigned to one condition or the other, which should result in a random distribution of participant variables across the conditions of the study. Although it is not foolproof, it is designed to prevent only a certain type of person being in one condition of the study.

Apply it

How would you go about controlling extraneous variables in the following investigations?

- A group of researchers were planning to investigate bystander behaviour in a local shopping centre. They decided to take turns throughout the week to drop their shopping in full view of other shoppers.
- A psychological study was set up to investigate the influence of music on memory. The researchers invited one group of maths students to listen to Mozart while learning a list of simple words. A different group of psychology students listened to rock music while learning a different list of simple words. The recall of participants was tested after they had listened to the musical piece.

Now consider how you might go about improving these studies.

Key terms

Counterbalancing: where half of the participant group experience condition A then condition B, while the other half experience condition B then condition A.

Randomisation: when participants are randomly assigned to condition A or B as their first or second test condition.

Single-blind technique: when information about the study is withheld from participants.

Double-blind technique: when the aims of the study are withheld from both participants and researchers.

Random allocation: when participants are randomly assigned to a condition of the study.

Hypotheses

What you will learn

- The meaning of a null hypothesis and how to write one.
- The meaning of an alternative hypothesis and how to write different ones.

Every research study has a **null hypothesis** and an **alternative (experimental) hypothesis**. Hypotheses are different from the aims of a study, which show the area of interest or investigation. Instead, hypotheses are statements of predicted outcomes based on the theory being tested.

The way in which a hypothesis is written depends on whether the investigation is looking for a difference in conditions (as a result of the IV) or a relationship between variables (in a correlation).

Null hypothesis

A null hypothesis is a prediction that the result or outcome will find no effect or very little effect. To write a null hypothesis, you need to imagine what would happen if you found very little effect of your IV on your DV.

For example, a null hypothesis when you are looking for a difference could be:

There will be no difference in the number of digits recalled whether participants listened to classical music or jazz. Any difference will be due to chance.

We add 'any difference found will be due to chance' because it is unlikely that no difference will be found, but the difference found will be too small to be due to the type of music listened to.

A null hypothesis when looking for a relationship (correlation) could be:

There will be no relationship between time spent revising and percentage score on a test; any relationship found will be due to chance.

Apply it

Write a null hypothesis for the following investigations:

- a study to see whether trained rats can run a maze faster than untrained rats
- a study to look at the relationship between hours spent on social media and exercising.

Key terms

Null hypothesis: a prediction that the results will fail to show any difference (or relationship) that is consistent or systematic.

Alternative (experimental) hypothesis: a prediction of the outcome of a study based on what is expected to happen.

Directional hypothesis: a hypothesis that predicts the direction the results will go in.

Non-directional hypothesis: a hypothesis that predicts that a difference/relationship will be found, but does not specify what the difference/relationship will be.

Experimental hypothesis: the name given to a hypothesis when used in field and laboratory experiments.

Alternative (experimental) hypotheses

An alternative hypothesis is a prediction of the expected outcome of a study. This is usually based on a theory.

If a theory makes a clear claim, then we can use a **directional hypothesis** (because the expected direction that the results will go can be predicted). For example, when looking for a difference:

Adults will recall more digits than children.

When looking for a relationship (correlation):

There will be a negative correlation between self-esteem and depression OR the more depressed people feel, the lower their self-esteem.

If a theory cannot make a clear prediction, or if the evidence is mixed, then we use a **non-directional hypothesis**. A non-directional hypothesis states that a difference or relationship will be found, but does not state what that difference or relationship will be. For example, when looking for a difference:

There will be a difference in the number of digits recalled by adults and children.

When looking for a relationship (correlation):

There will be a negative correlation between self-esteem and depression.

An **experimental hypothesis** is used when a laboratory or field experiment is being carried out.

Research methods – How do you carry out psychological research?

Methods of sampling

What you will learn

- The meaning of target population and samples.
- Techniques to gather a sample of participants: random, stratified, volunteer and opportunity.
- The strengths and weaknesses of these sampling methods.

Target population

A **target population** is the group of people that an investigation is concerned with or wishes to study and apply the findings to. If a study is looking at the impact of literacy programmes on preschool children, for example, the target population will be all preschool children. It is unlikely that the researchers will be able to study all preschool children, so a **sample** of the target population will be used (Figure 11.1). A sample should represent the nature of the target population. Being representative ensures that the findings of a study can be **generalised** to the target population concerned.

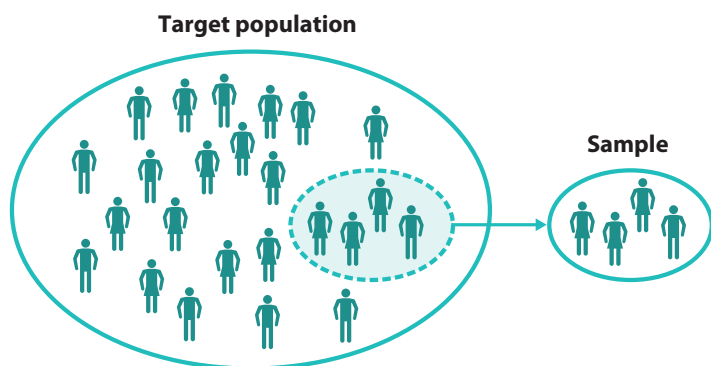


Figure 11.1 A sample of participants will be selected from the target population

Sampling methods

The way in which a sample of the target population is selected depends upon which **sampling method** (technique) is used. The type of technique used will depend upon practical and ethical issues.

Link it up

For more on ethical issues, look ahead at *Ethical issues in psychological research* and *Issues and debates*.

Random sampling technique

To achieve a random sample, the target population should be identified and all have an equal chance of being selected. This is known as a **random sampling technique**. This involves assigning every member of the target population with a number, and then drawing numbers from a hat (like a lottery).

Strengths and weaknesses

A random sampling technique should generate a representative sample as each member of the target population has an equal chance of being selected. This method helps control participant variables that may affect the findings of the whole study. Even if selected at random, however, participants still have to agree to take part in the research. Some may refuse to participate as this is ethically in their rights to do, which can lead to a less representative sample.

Stratified sampling technique

If a target population is made up of different types of people and a researcher wishes to replicate this in their study, then a **stratified sampling technique** can be used to achieve this. This technique identifies the subgroups within the target population and takes a random sample from each to ensure they are proportionately represented in the sample. For example, if a target population of office workers has 10 per cent of workers in senior management and 90 per cent in general office staff, then the sample should consist of equivalent proportions of these office workers, drawn at random.

Key terms

Target population: the group of people being investigated in a study.

Sample: a selection of the target population that is directly studied in an investigation.

Generalisability: the extent to which the results of a study represent the whole population, not just the sample used.

Sampling method: a technique used to gather a representative group of people as a sample from the target population.

Random sampling technique: a technique used to gather a random sample of participants from the target population.

Stratified sampling technique: a technique that ensures subgroups of the target population are proportionately represented in a sample.

Strengths and weaknesses

Stratified sampling is useful if a small subgroup of the target population may be missed by using a random sampling technique, and it ensures that the sample is completely representative as a cross section of a target population. However, it is time-consuming and suffers from the same weaknesses as random sampling techniques, in that people can still refuse to take part. This leads to a **sample error**, which can lead to invalid conclusions being drawn about the target population.

Volunteer sampling technique

A **volunteer sampling technique** involves gathering a sample of participants who are willing to volunteer themselves to take part in a study. This often involves advertising the study in some way, such as placing an advert in a newspaper or on a noticeboard, requesting volunteers to get in touch if they would like to participate.

Strengths and weaknesses

This sampling technique involves minimal effort on the part of researchers in identifying and selecting a sample. It is possible to recruit from a target population by placing an advert in a specific location, for example. It is also the most ethical sampling method because participants do not have to be asked to participate directly, thus avoiding placing pressure on people to participate. However, it is less representative than random or stratified sampling because not everyone in a target population will see the advert or want to respond. It can also lead to a **biased sample** as volunteers tend to be a particular type of personality or have time and the inclination to participate. This may mean that the findings are unreliable.

Opportunity sampling technique

An **opportunity sampling technique** makes use of people who happen to be around at the time of the research. This can be done by asking people to agree to take part, or simply studying people who happen to be there without their agreement (as in covert research).

Strengths and weaknesses

This is the quickest and simplest sampling technique available to researchers, but it can lead to a biased sample because not every member of the target population may be around at the time of the study. For example, if a study is investigating shopping behaviour and the researchers conduct an observation on a Monday morning, then the sample studied will exclude people who are working at that time. Working people will be unrepresented in the sample and this means that the findings drawn from the study are not generalisable to the target population of all shoppers. It also means that if the study were replicated at a different time of day/week, findings may differ and so may be unreliable.

Key terms

Sample error: when a sample differs in qualities from the target population it intends to represent.

Volunteer sampling technique: a technique that asks for participants by placing an advert for volunteers.

Biased sample: when the sample recruited is made up of a particular type of person, which may not reflect the target population.

Opportunity sampling technique: a technique that recruits participants who are readily available at the time.

Link it up

Look ahead at *Issues of reliability and validity when analysing research* to find out more about these issues.

Exam-style question

Give **two** strengths of the random sampling technique.
(2 marks)

Exam tip

It is often useful to compare the relative strengths and weaknesses of different sampling techniques so that you can fully explain your evaluation.

Research methods – How do you carry out psychological research?

Key terms

Research design: how participants are allocated to the conditions of a study.

Experimental design: the name given to research design when used in an experiment.

Independent measures design: participants are split into groups, with each group tested in only one condition of a study.

Repeated measures design: the same participants are used in all conditions of a study.

Matched pairs design: different participants are used in each condition of the study, but are matched for likeness on important characteristics.

Link it up

Bandura, Ross and Ross's (1961) study on the transmission of aggression uses a matched pairs design. See Topic 6 *Criminal psychology* to find out how the children were matched.

Research and experimental designs

What you will learn

- The different research and experimental designs.
- The strengths and weaknesses of these designs.

An essential decision when developing a study is to choose a suitable **research design**. This describes how participants are used within the study and in what conditions of the study they are tested. An **experimental design** is the name given to a research design when used in an experiment.

Types of research and experimental designs

There are three designs:

- **Independent measures design** – this involves splitting participants into groups and testing each group in only one condition of the study. This is also known as an independent groups design. Sometimes this is the only design possible, if gender or age is the IV for example, as a participant cannot be in both conditions.
- **Repeated measures design** – this involves using the same participants in all conditions of a study.
- **Matched pairs design** – this uses different people in each condition of the study, but matching them for likeness on important characteristics. The characteristics chosen for matching depend on the aims of the study. If you were conducting a study on whether different amounts of time spent revising affected test results, it would be important to match the participants on ability as well as ensuring everyone had the same notes to use for revision.

The strengths and weaknesses of these three designs are shown in Table 11.1.

	Strengths	Weaknesses	Controlling problems
Independent measures design	There are no order effects as participants only take part in one condition of the study.	More participants are needed than for a repeated measures design. There may be individual differences between the groups.	Participants can be randomly allocated to each condition.
Repeated measures design	Fewer participants are needed, making it more economical. There are no individual differences between conditions of the study.	Demand characteristics are more likely as participants are more able to guess the aim. Order effects mean that results may reflect practice or fatigue.	Order effects need to be controlled using counterbalancing or randomisation.
Matched pairs design	Fair comparisons can be made between the groups as they are equally matched.	It is time-consuming to match participants and not all characteristics can be equally matched.	

Table 11.1 Strengths and weaknesses of research and experimental designs

Issues of reliability and validity

What you will learn

- Issues of reliability and validity in sampling methods, experimental design, and quantitative and qualitative methods.

Reliability

Reliability refers to the consistency of an outcome or result of an investigation, which means that the same result is found again and again. This is an important feature of science because we can trust the findings and know that they are not a one-off result. How we plan and conduct research can affect the reliability of the outcome. If a standardised procedure is not used, there can be variability in the procedure, which can result in unreliable findings.

Reliability in sampling methods

If a sampling method or technique leads to a biased sample, then the outcome of the research may not be relied upon to occur again, as it could differ if the study was replicated.

Reliability in experimental designs

In an independent measures design, participants differ between conditions, so there is variability between groups because of participant variables. This can lead to unreliable findings.

Link it up

Look at *Methods of sampling* and *Research and experimental designs* to find out more about issues of reliability and validity.

Validity

Validity refers to the extent to which a study measures what it intends to measure. If a study is designed to measure aggression in preschool children, then it is important that the measures of aggression actually test that characteristic (this is known as **internal validity**). The sample of preschool children must also correctly represent the intended target population (this is known as **external validity**). The way in which we design a study can affect the validity of the results.

Key terms

Reliability: the consistency of an outcome or result of an investigation (a measure).

Validity: whether the test measures what was intended.

Internal validity: whether the measures used in a test genuinely test what they were designed to test.

External validity: whether the findings are generalisable to the target population.



A child pushing another child in a playground could be observed as aggressive, but this would not be a valid finding if the children were just playing tag.

Research methods – How do you carry out psychological research?

Key terms

Qualitative methods: ways of conducting research that find out new information rather than testing a prediction; often resulting in gathering qualitative data.

Researcher bias: when a researcher interprets the outcome of a study according to their own view (subjective).

Triangulation: when more than one measure is taken for a behaviour to cross-validate the findings.

Objective: not open to interpretation, unbiased.

Quantitative methods: ways of conducting research that test a prediction and gather quantitative data.

Validity in sampling methods

If a sample error occurs then the findings of the research are untrue of the target population. This affects the (external) validity of the results.

Validity in experimental design

The way in which participants are allocated to the conditions of a study, known as the experimental or research design, can affect the validity of the findings. For example, if a repeated measures design is used and order effects are shown, this can mean that the outcome may be a result of practice or fatigue and not the intended variable being investigated. If we wanted to investigate whether male or female faces are easier to recognise, for example, it could be that participants become tired of recognising male faces in the second condition after having to recognise female faces in the first condition. This would result in a finding that suggests we find male faces difficult to recognise, but actually the result is due to order effects. Similarly, demand characteristics are more likely in a repeated measures design, which can also invalidate the results.

Reliability and validity of qualitative and quantitative methods

Qualitative methods are research methods where the emphasis of the research is on gathering lots of detailed information from which ideas and theories emerge. Qualitative methods can include case studies, unstructured interviews and participant observation. These methods tend not to follow the normal scientific route of enquiry because they are not testing hypotheses in a traditional way. Instead, they are more exploratory.

Because qualitative methods are more exploratory and designed to understand behaviour from the perspective of participants, they are not easy to replicate. This means that they may not produce reliable findings. The information gathered using qualitative methods is likely to be restricted to those individuals being studied, which limits the generalisability of the findings (external validity).

In qualitative studies, the researcher can become very involved in the investigation and close to their participants, which can result in **researcher bias** and investigator effects. This may lower the validity of the findings. However, qualitative researchers are mindful of these issues and use techniques such as **triangulation** to ensure they do not lose their professional **objectivity**.

Quantitative methods tend to follow the normal scientific route of enquiry, starting with a hypothesis to test a theory. A study is designed and conducted to test the hypothesis and results are generated to support or not support the theory. These methods are typical of experiments and some types of questionnaires and observations.

Quantitative methods are designed to gather facts and measure behaviour that can be applied to the target population, which means that they produce data that is generalisable to others (external validity). Quantitative methods allow a researcher to remain detached from their participant, so the method is seen as more objective and less open to researcher bias.

Link it up

Look ahead at *Understanding research methods* to find out more about the different types of research methods and issues of reliability and validity.

Link it up

To find out more about qualitative and quantitative data, look ahead at *Types of data*.

Ethical issues in psychological research

What you will learn

- Ethical issues in psychological research and how they are dealt with.

Most psychological research involves human participants, although some can involve animals or computer simulations. It is therefore very important to consider **ethical issues** when carrying out research. The British Psychological Society (BPS) have produced a guide to help psychologists identify, consider and deal with ethical issues through a series of ethical guidelines.

The BPS Code of Human Research Ethics (2014)

The BPS code of ethical guidelines is based on four key principles.

- 1 Respect for the autonomy, privacy and dignity of individuals and communities** – researchers have a moral duty of care to respect participants' individual and cultural differences. This includes a respect for their age, ability, gender, sexuality, religion and culture. Psychologists should seek to inform participants of the nature of the study and offer them the **right to withdraw** at any point. It also means that they should protect participants from harm, take care not to intrude on their privacy and safeguard their details.
- 2 Scientific integrity** – psychologists are duty-bound to conduct well-designed research and not claim any misleading findings.
- 3 Social responsibility** – psychologists are duty-bound to produce beneficial findings that can be used by communities and that offer value to organisations. They have a collective responsibility to society as well as to the participants.
- 4 Maximising benefit and minimising harm** – participants should not be placed in any situation that they would not ordinarily encounter. However, if the benefit of the research outweighs the cost to participants, psychologists should safeguard participants and minimise risk of harm as much as possible. Predicting risk can be difficult because individuals are affected differently by certain procedures. A cost-benefit analysis should be conducted to avoid harm.

These principles are the foundation for psychological research with human participants, but other guidelines should also be considered.

Key terms

Ethical issues: researchers follow codes or rules of conduct when carrying out research to protect participants from harm.

Right to withdraw: ensuring that participants are clearly aware of their right to leave the study at any point.



The focus of psychological research is human behaviour, so we need to take care to ensure participants are well looked after during investigations

Research methods – How do you carry out psychological research?

Informed consent

It is important that participants give their **informed consent** to participate in psychological research. To achieve this, participants are given a consent form and information that details what will be expected of them throughout the study, the aims of the research, what will be done with the findings and clear guidance on how to withdraw if they no longer wish to participate. If a participant is unable to consent because they are too young or not able to understand, then researchers must seek consent from a guardian or professional.

Sometimes research is conducted without the consent of participants, for example, observing the everyday behaviour of people in public places. Even in such circumstances, the researchers should be sensitive to issues of privacy and cultural beliefs.

Apply it

Write a consent form for one of the studies that you have learned about during your course.

Deception

Deception involves misleading or lying to participants about the nature of the investigation. This violates a participant's ability to give informed consent, so should be avoided. However, it can be seen as necessary to deceive participants to maintain the integrity of a study, as long as the participants are protected and the deception is disclosed as soon as possible. This usually occurs during a **debrief**, where the aims and intended outcomes of a study are fully disclosed.

Confidentiality

Participant information should be kept **confidential** at all times to ensure participants cannot be identified by the research. Participant details are often kept secret to ensure confidentiality is maintained. This means that researchers keep participants' records in a safe and secure place, and destroy them after a suitable amount of time, as agreed with participants.

Key terms

Informed consent: agreement of participants to take part once they are fully aware of the aims, nature and intended outcomes of a study.

Deception: misleading or lying to participants.

Debrief: after an investigation, participants are given full disclosure of the study.

Confidentiality: not disclosing the identity of participants.

Protection of participants: safeguarding participants against physical and psychological harm.

Right to withdraw

From the outset of any research, participants should be aware that they have every right to withdraw from the study at any point. This includes being able to withdraw their results for an agreed time after the study is complete. A participant should never be offered an incentive, such as money, to forgo their right to withdraw.

Link it up

Piliavin et al. (1969) conducted an experiment where passengers on a train were unaware of their participation. Look at Topic 5 *Social influence* to find out more. Identify what ethical issues are associated with this study.

Protection of participants

Protection of participants refers to the guideline that participants should always be protected from physical and psychological harm. Psychological harm is quite subjective as some people may be more distressed or embarrassed than others, so it is important to consider how each participant may feel from their point of view. Once this has been established, the researchers should highlight any aspect of a procedure that may cause individual psychological harm and minimise these risks. Incentives should not be used to encourage participants to endure harm that is beyond what they may experience in everyday life.

Link it up

Ethical issues are discussed further in the *Issues and debates* section. Read ahead to find out more.

Understanding research methods

What you will learn

- Different types of research methods used by psychologists.
- The types of research for which they are suitable.
- The strength and weaknesses of each method.

Experiments

Laboratory experiment

A **laboratory experiment** is an investigation that takes place in a controlled environment. It is therefore untypical of a place where the behaviour being studied would naturally occur. It is an environment where researchers stage the conditions of the study and invite participants along.

A laboratory experiment has an IV and a DV, and the aim is to discover cause and effect between these variables by controlling or eliminating other extraneous variables.

Link it up

You will have come across a number of laboratory experiments in this course, such as Peterson and Peterson's (1959) investigation into the duration of short-term memory. Look at Topic 2 *Memory* and see if you can identify the IV and DV and controls used by the study.

Laboratory experiments are useful for studying many types of behaviour, but are more useful for studying behaviour that might not be affected by the artificial environment of a laboratory, such as memory or reaction tests. They are useful in studies that need to isolate the IV and DV and exercise control.

Field experiment

A **field experiment** is an experiment conducted in a natural environment, but there is still an IV that is manipulated by the researcher and a DV that is measured. There is control over extraneous variables, but the level of control is not as high as in a laboratory because naturalistic environments are more unpredictable. Participants may or may not be aware of taking part in the research.

Field experiments are useful when studying behaviour that needs to be seen and tested in a natural

environment, such as conformity and obedience, which are studied by social psychologists.

Link it up

You will have come across several field experiments in this course, such as Piliavin et al.'s (1969) study on a train. Look at Topic 5 *Social influence* and see if you can pick out the main features of a field experiment in this study.

Exam-style question

Describe how you would design a laboratory experiment to test the influence of exercise on sleep. In your description, you should include variables, apparatus, research and experimental design, and controls.

(5 marks)

Exam tip

You should be prepared to apply your knowledge of research methods to any novel situation or context you are given. These may be drawn from the compulsory topics of Paper 1.

Key terms

Laboratory experiment: a procedure staged in an artificial environment.

Field experiment: a procedure staged in a naturalistic environment.

Natural experiment: a study that examines a naturally occurring variable in a real-life situation.

Natural experiment

A **natural experiment** also occurs in a real-life environment and has an IV and DV, but the researchers themselves do not manipulate the IV as it occurs naturally. Naturalistic experiments are generally opportunist, which means that they make use of unique and naturally occurring situations that would otherwise be difficult, or even unethical, to set up.

Link it up

A natural experiment was conducted by Charlton et al. (2000) to investigate the effects of television on children's behaviour. This experiment is described in Topic 6 *Criminal psychology*. See if you can identify the naturally occurring IV in this study.

Research methods – How do you carry out psychological research?

The strengths and weaknesses of the different types of experiment are shown in Table 11.2.

	Strengths	Weaknesses
Laboratory experiment	The most scientific of the research methods because of high levels of control. Cause and effect can be established between the IV and DV, which can help with (internal) validity.	Conducted in an unnatural environment. Participants are invited to the experiment so they may display demand characteristics. Considered reductionist because it isolates only the variables under consideration, ignoring other variables that could also be involved.
Field experiment	Conducted in a naturalistic environment, so the behaviour is natural. There is cause and effect between the IV and DV, and some extraneous variables can be controlled.	Not all extraneous variables can be controlled because it is a real-life environment. Participants may be unaware of taking part so researchers may not have gained informed consent.
Natural experiment	The IV is naturally occurring and not manipulated. The environment in which participants are studied is real and naturalistic.	It is not possible to randomly allocate participants to conditions of the IV, so there may be issues with participant variables that can influence the findings. Extraneous variables are difficult to control.

Table 11.2 Strengths and weaknesses of different types of experiment

Apply it

Identify what type of experiment is being described in the following examples:

- Researchers wanted to see whether using animals in a local residential care home for the elderly improved the residents' feelings of well-being.
- Researchers set up an experiment at a local train station to see if people were able to identify the perpetrator of a staged crime.
- Researchers conducted a memory experiment in a controlled setting to see if people recalled more words from a list that was either organised or randomly arranged.

Interviews

An **interview** is a non-experimental method as it does not manipulate an IV directly. Instead, an interview is a research method designed to gain information directly from participants about their beliefs, opinions and attitudes. It involves asking participants (or respondents) questions and then analysing their answers.

Interviews can be done face to face, or over the phone, and can be more or less structured depending on what type of information the researchers aim to gather and for what purpose. For example, a clinical interview is one conducted by a clinician with a patient. As each patient will present different symptoms and issues, the clinician needs to be fairly flexible with the questions that they ask, so a less structured interview is better in this case.

Key term

Interview: a research method designed to gather self-reported information from participants.



Interviews tend to be conducted face to face with a respondent. Can you think of any advantages or disadvantages of this?

- A **structured interview** is a standardised list of pre-set questions that a respondent is asked. A strict **interview schedule** is followed so that respondents are asked exactly the same questions in the same way and order. These questions are prepared beforehand and the researcher will not deviate from the interview schedule. Structured interviews are more suitable for large-scale studies where a number of interviewers are required to get information from lots of respondents.
- A **semi-structured interview** has pre-set questions that are prepared beforehand and a framework to follow, but also some open-ended questions or points of discussion that the researcher can follow up with the respondent. This allows some free-flowing conversation to occur, allowing the interviewer to explore the respondent's thoughts and beliefs when opportunities arise throughout the interview.
- An **unstructured interview** does not have prepared questions or a schedule to follow. Although an interviewer may have a broad aim to follow, they generally have a conversation with respondents that can go in all sorts of directions. Typically, the interviewer directs questions based on the respondent's answers, like a clinical interview described above. This type of interview is most suitable when in-depth information needs to be gathered from a small group of respondents.

Exam-style question

A researcher wanted to investigate the impact of a new postnatal care programme on a small, local maternity ward. The researchers were interested in what women felt about the postnatal experience and if they thought it could be improved.

Explain what type of interview would be most suitable for this type of investigation. **(3 marks)**

Link it up

Van Houtte and Jarvis (1995) used interviews as part of their investigation into how pets affect children's development. Read more about this study in Topic 7 *The self*.

Key terms

Structured interview: a set of pre-set questions asked to a respondent.

Interview schedule: a list of set questions around the study aim.

Semi-structured interview: a mix of pre-set questions and unprepared questions asked to a respondent.

Unstructured interview: a free-flowing conversation around a particular topic with a respondent.

Exam tip

'Explain' questions require you to make an appropriate decision and justify or exemplify your point. In this case, you need to decide what would be the most suitable type of interview for this scenario, and then justify your choice.

Research methods – How do you carry out psychological research?

Key terms

Social desirability bias: during an interview, a respondent may answer a question in a way that is deemed socially acceptable.

Interviewer effect: the characteristics of an interviewer impact the way a respondent answers questions.

Questionnaires: a self-report technique designed to ask lots of people questions about a topic.

Closed-ended questions: questions with a fixed response to choose from.

Link it up

Unstructured interviews typically gather qualitative data and structured interviews typically gather quantitative data. Read ahead to find out more about types of data.

Strengths and weaknesses of an interview

An interview gathers information about a person's beliefs, feelings, attitudes and opinions, which would be very difficult to achieve in an experiment. However, they can suffer from **social desirability bias**, where respondents answer in a way they feel is more socially acceptable. The interviewer can also cause an **interviewer effect**.

Structured interviews are able to gather a lot of information from a large number of people relatively quickly. The interviewers require very little training as they have a pre-set interview schedule to follow. They are also easy to replicate, as every question is the same. However, they can only access superficial information from respondents and do not allow respondents to answer freely.

Semi-structured interviews have the benefit of asking pre-set questions and giving respondents the freedom to answer in their own way. Interviewers can deviate from the interview schedule if they feel an interesting avenue of conversation can be explored. However, they can be more time-consuming than structured interviews and the interviewers require more training on how to conduct an interview.

Unstructured interviews gather the most in-depth information and are free to explore the beliefs and attitudes of respondents fully. They are very time-consuming, both when conducting and analysing the data, and interviewers need to be well trained, as they need to build up a rapport with respondents. They are impossible to replicate because not all respondents are asked the same question.

Questionnaires

A **questionnaire** is a self-report technique that investigates people's beliefs, options and attitudes first hand. Questionnaires are more flexible than interviews as an interviewer is not needed to administer the questionnaire; it can be posted by mail or online. A questionnaire is suitable when a large number of people need to be surveyed at one time and can be designed to ask many different types of question.

- **Closed-ended questions** are designed with a pre-set list of answers that a respondent can choose from. Simple closed-ended questions offer a yes/no response. Other types of closed-ended questions can be designed to offer other options (Figure 11.2a and b).



Questionnaires gather self-report data. List the issues you might face when asking people questions about themselves.

Figure 11.2a A 7-point Likert-type scale measuring extraversion

Link it up

Likert-type scales are used to measure personality. Look at Topic 7 *The self* to find out more.

Figure 11.2b A fixed-response question

- **Open-ended questions** do not have pre-set responses, but allow the respondent to answer freely, using prose. For example: How do you feel about animal research?

Apply it

Design one closed-ended and one open-ended question to investigate phobias.

Key terms

Open-ended questions: questions with no fixed response.

Correlation: a way of analysing relationships between variables.

Co-variables: two variables that can be plotted against each other to indicate the type of relationship between them.

Strengths and weaknesses of questionnaires

Questionnaires are an inexpensive way of gathering information from a large sample. They are also ethical because people can quite easily choose not to complete them. The respondents are not affected by the presence of an interviewer, and may be more likely to respond honestly, which can reduce the social desirability effect. However, the response rate for questionnaires is relatively low, as people may not have the time or inclination to complete and return the questionnaire.

Closed-ended questionnaires produce quantitative data, which is relatively easy to analyse and is objective. However, respondents may feel that the right option is not available to them or that they would like to explain their choices. Open-ended questions are more difficult to analyse because they produce qualitative data, which may be open to interpretation. However, they offer more freedom for respondents than closed-ended questions.

Correlation

A **correlation** is a technique designed to look for relationships between variables. Data can be gathered using a range of research methods, such as an observation or questionnaire, but the researcher analyses the data using a correlation. Researchers are looking for a relationship between **co-variables**. The way that these co-variables change when examined together tell us about the nature of the relationship between them. This can be seen when the co-variables are plotted on each axis of a scatter diagram.

Link it up

To find out more about scatter diagrams, look ahead to the *Data analysis* section.

Research methods – How do you carry out psychological research?

Key terms

Positive correlation: as one co-variable increases, the other co-variable increases.

Negative correlation: as one co-variable increases, the other co-variable decreases.

Case study: a study of a single person, group or event.

- A **positive correlation** or relationship is found when a co-variable increases as the other co-variable increases. For example, we would expect the co-variable 'time spent revising' and the co-variable 'percentage grade achieved on a test' to show a positive correlation. This would mean that those who spend less time revising achieve a lower test score and those who spend a lot of time revising achieve a higher test score.
- A **negative correlation** or relationship is found when one co-variable increases as the other co-variable decreases. For example, we would expect that as the co-variable 'time spent on social media' increases, the co-variable 'percentage grade achieved on a test' would decrease. This would mean that the more time people spend on social media, the lower the test score, and the less time spent on social media the higher the test score.

Apply it

Identify what type of correlation has been found in the following studies:

- A study found that the more negative life events we have, the lower we tend to feel in mood.
- A study found that happiness increases as people get older.

Strengths and weaknesses of correlations

Correlations are useful for examining relationships between many variables; they are cheaper and less time-consuming than experimental research. They are also useful when investigating a topic that would be difficult to study experimentally for ethical reasons. Correlations compare co-variables rather than manipulate behaviour. Using co-variables rather than manipulation is less interventionist and therefore likely to be more ethical. For example, a correlation to examine the relationship between day care and aggression would be more ethical than placing children into different types of day care to study the outcomes.

A serious weakness of a correlation is that cause and effect cannot be established. We cannot say that one variable causes another to occur as it could be the other way around, or a third variable that has not been studied could be exerting an influence. For example, a person's test score could be due to a lack of understanding about what they are learning rather than social media use.

Link it up

In Topic 2 *Memory*, you learned about amnesia, which is a rare condition that can be caused by damage to the brain. Go back and remind yourself about the case study of Henry Molaison.

Case study

A **case study** is an in-depth investigation into one person or a group of people. It typically involves the use of a range of research methods, such as interviews, experiments and observations. They are generally suitable for the study of unique or rare individuals, such as brain-damaged patients, or people with unique circumstances that a psychologist could not have staged for ethical or practical reasons.

Develop it

Case studies have been useful when studying the impact of isolation on young children. Use the internet to find out the unique cases studied by Susan Curtiss (1977) and Jarmila Koluchová (1976). Consider why the case study was the most appropriate research method to use in these cases.

Strengths and weaknesses of a case study

A case study can be used in situations that would be unethical to set up experimentally, and it provides the most in-depth information about a particular individual. They can stimulate research into new areas of psychology that would not have been found unless rare individuals had been studied.

Case studies cannot be repeated to check the reliability of the findings, as every individual studied is unique. The findings from case studies may not be applicable to other people, so lack generalisability. Because the researcher may be intensely involved in gathering data from the case study, they may lose their objectivity and interpret the findings differently from others. This is known as researcher bias, but it can be avoided if triangulation is used – a researcher uses different methods to validate their findings. For example, they could conduct an intelligence test on a child and cross-reference this outcome with observations of the child in the classroom and interviews with teachers.

Observation

An **observation** is a research method designed to simply observe and watch what people do in certain situations or environments. There are several different types of observation that are chosen according to the topic of investigation.

- A **naturalistic observation** is conducted in an everyday environment where the behaviour being studied would normally be seen. People in a naturalistic observation would be expected to behave normally and spontaneously, and a researcher will record what they see. Naturalistic observations are suitable when studying everyday behaviour.

Link it up

Gunderson et al. (2013) used a naturalistic observation to investigate parental praise. Find out more about this study in Topic 1 *Development*.

- A **controlled or structured observation** tends to be conducted in a laboratory or controlled environment, where a researcher may stage a situation or set up the environment to encourage the behaviour they are trying to investigate. This type of observation is suitable when it may not be practical for an observer to wait for a behaviour to occur naturally.
- **Overt observations** are conducted with the participant's knowledge that they are being observed and form part of an investigation. **Covert observations** are conducted without the participants being aware that they are being watched. Structured observations tend to be overt because participants are invited to the controlled environment, and naturalistic observations can be either covert or overt.
- When an observer becomes involved in the group that they are observing, it is known as a **participant observation**. When the observer simply stands back, watches and records without being actively involved, it is known as a **non-participant observation**.

Key terms

Observation: a research method that involves watching and recording behaviour.

Naturalistic observation: an observation conducted in an everyday environment where the behaviour being studied is normally seen.

Controlled or structured observation: an observation carried out in a laboratory or controlled environment.

Overt observation: participants know they are being observed as part of an investigation.

Covert observation: participants are unaware that they are being observed.

Participant observation: when an observer is involved in the group they are observing.

Non-participant observation: the observer watches and records people without being actively involved.

Research methods – How do you carry out psychological research?

Develop it

Mary Ainsworth (1969) devised a procedure called the Strange Situation to investigate attachment behaviour in children. This was a structured observation involving a child being placed in a room with a stranger and the reactions of the child were observed. More information about the Strange Situation Procedure can be found on the internet. See if you can identify features of a structured, non-participant observation from your research.

Strengths and weaknesses of an observation

Observations can be unreliable if certain measures are not in place. It could be that observers do not detect behaviours, or that observers' interpretation of what is meant by a particular behaviour differs. Each coded behaviour needs to be clearly operationalised and the observers need to be well trained in how to conduct an observation in order to correctly record coded behaviours.

Key terms

Inter-rater reliability: when more than one observer codes behaviour and their results are compared to check for agreement.

Observer bias: when an observer interprets the observed behaviour according to their own view.

The reliability of observations can be checked using **inter-rater reliability**. This is when more than one trained observer codes the observation, and these results are compared to check for agreement. This requires the observation to be recorded so that it can be replayed to different observers.

Observations can lack validity for a number of reasons. If the coded behaviours are not a good measure of the concept being tested, this can result in a lack of (internal) validity. Observations can also lack validity because of **observer bias**. This is more likely in a participant observation because the observer becomes involved in the group being studied and may lose objectivity.

There may be ethical issues associated with observational research. Covert observations can raise the issue of lack of consent. Participant covert observations raise particular ethical concerns because the researcher, who may be acting as a group member, deceives participants.

Exam-style question

Explain **one** strength and **one** weakness of an observation. **(4 marks)**

Exam tip

It is important to specify which observation technique you are referring to in your answer. If you are criticising observations for ethical reasons, these may not apply to all observational techniques, so you need to say which technique is associated with the ethical issue.

Data analysis

What you will learn

- The use of arithmetic and numerical computation, including using standard and decimal form, estimates and significant figures.
- The use of maths skills (percentages, ratios, fractions), descriptive statistics (range, mean, median and mode) and how to calculate them.

Data analysis involves summarising data in order to draw conclusions from psychological research, which often produces a great deal of data.

Arithmetic and numerical computation

Standard and decimal form

Standard form is a way of writing down large numbers without including all the digits. For example, $10^3 = 10$ to the power of 3 = $10 \times 10 \times 10 = 1000$. So:

$$5 \times 10^2 = 5 \times 10 \times 10 = 500$$

Decimal form refers to any number in the base-ten system. Put more simply, numbers are thought of as 'over' 10 or in terms of tenths. For example, the fraction $\frac{1}{2}$ written as a number 'over' 10 would be 5 over 10 (multiply the top and bottom of the fraction by 5). There are 5 'tenths' and the decimal point goes in front of the 'tenths' to be written as 0.5.

Decimals can be more accurate, more helpful and easier to use to present data than fractions. For example, $\frac{5}{100}$ presented in decimal form is 0.05 and $\frac{243}{1000}$ in decimal form is 0.243.

Decimal places and rounding

In this course, you are likely to be asked to use decimal form to 2 **decimal places**. For example, if a score for reaction time is given as 56.782 milliseconds, showing 3 decimal places, you will need to convert this to 2 decimal places:

$$56.782 = 56.78 \text{ to 2 decimal places}$$

The rules for **rounding** to 2 decimal places are as follows.

- If the third digit is less than 5, the figure is rounded down. This means the third digit is lost.
- If the third digit is 5 or more, the second digit is rounded up ($45.336 = 45.34$; $48.498 = 48.50$).

Exam-style question

A study was carried out by Smith (1938) to see whether reaction time to a flash of light would inform understanding of the functions of the two hemispheres of the brain. The mean (average) reaction times for left- and right-hand responses were recorded as 0.248 and 0.251 milliseconds.

- Give each of these reaction times to 2 decimal places. **(2 marks)**
- Using your answer to part a, explain **one** problem with using 2 decimal places. **(2 marks)**

Key terms

Data analysis: transforming and summarising data to find and show useful information.

Standard form: a way of writing large numbers in an abbreviated form, such as 10^4 instead of 10,000

Decimal form: to the number 10 or 'tenths'.

Decimal places: the number of digits after the decimal point.

Rounding: a way of simplifying a number by reducing it to a specified number of decimal places.

Exam tip

Be ready to do calculations using decimal form, such as 'reducing' numbers to 2 decimal places. Practise doing this in your revision and be prepared to comment on results.

Research methods – How do you carry out psychological research?

Key terms

Significant figures: digits that have meaning in a number and signify a level of accuracy.

Estimate: do a quick, rough calculation of what the results are showing.

Significant figures

Numbers can also be rounded up or down using **significant figures**.

'Significant' here means 'having meaning'. In any number, the first digit (starting from the left) is the most significant. For example, in the number 1243, the '1' is the most significant digit because it tells us that the number is one thousand and something. If you were asked to write this number to 1 significant figure, you would round it as 1000. The same 'rules' for rounding apply here.

Zeros are placeholders – they are important but they are not always significant figures. For example, with the number 0.00378, the '3' is the most significant digit because it tells us that the number is three thousandths and something. If you were asked to write this number to 1 significant figure, you would round it up to 0.004. If you were asked to write it to 2 significant figures, your answer would be 0.0038. Zeros are significant figures when they sit between two non-zero digits. For example, in the number 3807, the '0' is the third significant figure.

Estimation of results

It is useful to be able to **estimate** what the results of a study might mean. This indicates early on what any future analysis of the results is likely to come up with.

For example, Table 11.3 shows some data from a study that is looking at whether the more extravert someone is, the more likely they are to be self-declared risk-takers. An estimation of these results would look to see whether it is likely that a correlation exists, and in what direction.

Participant	Score on extraversion–introversion scale (out of 40, extraversion is scored 'high')	Score on perceived acceptance of risk (out of 40, risk is scored 'high')
1	20	15
2	35	28
3	12	10
4	16	34
5	30	25
6	24	20

Table 11.3 An extract of results from a made-up study into extraversion and risk-taking

It can be seen that Participant 3 has a low extraversion score (12) and a low risk-taker score (10). Participants 1 and 6 have a mid score for both. These three participants' scores suggest that the two variables link and there is a positive relationship between them, in that a higher extraversion score means a higher risk-taker score. Participants 2 and 5 have higher but similar scores for 'extraversion' and 'risk', again suggesting a relationship. However, participant 4 has a low extraversion score (16) and a very high risk-taking score (34), suggesting there is no relationship. Overall it looks as if there is a positive correlation between the two variables, which is what was expected.

Maths skills

Ratios

Ratios are used to compare quantities. A ratio shows how much of one thing compares to another. For example, if girls are twice as likely as boys to have a specific mental disorder, the ratio of girls to boys is 2 to 1. This can be shown as 2:1.

Apply it

Ati's mum has been diagnosed as having depression and Ati wants to know the likelihood of her father having a similar diagnosis. She found that out of a sample of 100, for every six females diagnosed with depression, three men (also from a sample of 100) were diagnosed with depression.

State in two different ways the ratio of females to males that Ati found when looking at gender and depression.

Key terms

Ratios: compare one thing against another to show proportions.

Fractions: a way of cutting something up to show proportions.

Percentage: a fraction of 100, found by multiplying a fraction by 100.

Fractions

Fractions can also be used to show proportions. If you have a total (or whole) number of something, then you can work out fractions to show differences within the whole. In a survey about happiness, for example, 60 participants claimed to be happy. These participants fell into four age bands (Table 11.4).

Band 1: 21–30 years	Band 2: 31–40 years	Band 3: 41–50 years	Band 4: 51+ years
Number: 25 out of 60 Fraction: $\frac{25}{60} = \frac{5}{12}$	Number: 15 out of 60 Fraction: $\frac{15}{60} = \frac{3}{12}$	Number: 10 out of 60 Fraction: $\frac{10}{60} = \frac{2}{12}$	Number: 10 out of 60 Fraction: $\frac{10}{60} = \frac{2}{12}$

Table 11.4 The fraction of happy people in each age band in a fictionalised study

Usually, you reduce the fraction by dividing the top and the bottom numbers as far as you can. In this case, however, sticking to twelfths allows you to compare across the age bands. Note that if your calculations are correct, the fractions should add up to a whole number:

$$\frac{5}{12} + \frac{3}{12} + \frac{2}{12} + \frac{2}{12} = \frac{12}{12} = \text{the whole number}$$

Percentages

A **percentage** is a fraction of 100. To find a percentage of something, work out the fraction and then multiply by 100 ('of' means multiply). For example, 200 people were surveyed to find out how many thought practice, genetic make-up or good schooling were the main reason for someone having a good memory. A fourth option, 'do not know', was also provided. To find the percentage for each option, divide the number who chose that option by the total (200) and multiply by 100. The results are shown in Table 11.5.

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Practice = 58	Genes = 89	Schooling = 42	Do not know = 11
$\frac{58}{200} \times 100 = 29.00\%$	$\frac{89}{200} \times 100 = 44.50\%$	$\frac{42}{200} \times 100 = 21.00\%$	$\frac{11}{200} \times 100 = 5.50\%$

Table 11.5 Percentage of people choosing a reason for someone having a good memory in a fictionalised study

The total percentage must always add up to 100 per cent. The percentages in Table 11.5 are written in decimal form, using 2 decimal places.

Apply it

Koko carried out a survey to find out what proportion of people said they became anxious when taking an exam. He asked 80 people: 35 said they strongly agreed to feeling anxious, 14 said they agreed, 12 said they disagreed and 19 said they strongly disagreed.

Calculate the proportions for Koko, using a) fractions, b) decimal form and c) percentages. Show your workings, using 2 decimal places as appropriate.

Key terms

Descriptive statistics: ways of summarising data to make raw data easier to understand. Descriptive statistics include the mean, median, mode, range and also graphs.

Raw data: the results themselves, without analysis.

Range: the difference between the highest and lowest score in a set of data, to show the spread of scores.

Measure of dispersion: a way of showing the spread of scores and variability.

Descriptive statistics

Descriptive statistics are used to summarise **raw data** – the whole set of scores from a study – before any analysis takes place.

The range

The **range** is a **measure of dispersion**. It is the difference between the smallest and largest score in a set of data, and indicates the spread of the data. In a class test, for example, the highest score out of 28 students was 58 per cent and the lowest was 50 per cent. The spread of scores here is small at just 8 per cent. A different class took the test, the highest score was 78 per cent and the lowest score was 40 per cent, a range of 38 per cent. This shows the variability in the performance in the second class was much greater.

The range is useful when comparing two sets of data. Table 11.6 shows the results for males and females in a made-up study. The ranges show that they have a similar spread of scores.

Males	Females
Scores: 10, 8, 5, 12, 6, 7, 11, 5, 15, 11	Scores: 15, 12, 11, 16, 14, 12, 9, 10, 17, 15
Range = highest score–lowest score = 15–5 = 10	Range = 17–9 = 8

Table 11.6 Scores showing the time taken to complete a jigsaw, in minutes

Mode, median and mean (arithmetic mean)

The **mode** is the number that appears most often in a set of numbers. If there are two modes, the data are **bi-modal**. More than two modes is called **multi-modal**. The mode can be applied to all numbers in a dataset (Figure 11.3), whatever the numbers represent, including time, ranked numbers and categories.

The number of words recalled by 10 participants from a list of 20

Scores: 6, 9, 3, 5, 12, 17, 8, 9, 6, 19

Scores put into order: 3, 5, 6, 6, 8, 9, 9, 12, 17, 19

Mode: 6 and 9

Figure 11.3 Working out bi-modal scores

The **median** is the middle score of a set of numbers and is applied to data that are ranked. Figure 11.4 uses the previously ranked scores (for mode).

The number of words recalled by 10 participants from a list of 20

Scores put into order: 3, 5, 6, 6, 8, 9, 9, 12, 17, 19

The median is between the 5th and 6th score: 8 and 9 respectively.

$$\text{Median} = \frac{8 + 9}{2} = 8.5$$

Figure 11.4 Working out the median

The **mean** is the average and is found by adding up all the numbers in the dataset and then dividing by the number of data points (Figure 11.5). Data points are items of data that contribute to a dataset. The mean is also called the **arithmetic mean**. The mean/arithmetic mean can only be applied to data that are actual measures, such as time, temperature and age.

Using the times taken to complete a jigsaw, in minutes

Scores for males: 10, 8, 5, 12, 6, 7, 11, 5, 15, 11

Mean for males = $10 + 8 + 5 + 12 + 6 + 7 + 11 + 5 + 15 + 11$

$$= \frac{90}{10} = 9$$

Scores for females: 15, 12, 11, 16, 14, 12, 9, 10, 17, 15

Figure 11.5 Working out the mean

Exam-style question

- Using Figure 11.5, calculate the mean score for females to 2 decimal places. **(1 mark)**
- Give a conclusion from the means for male and female scores in Figure 11.5. **(1 mark)**

Key terms

Mode: in a set of numbers, the most common one (the one found most often).

Bi-modal: when there are two modes in a set of numbers.

Multi-modal: when there is more than two modes in a set of numbers.

Median: the middle score in a set of numbers.

Mean/arithmetic mean: the average of a set of numbers, found by adding them all up and dividing the result by how many original numbers there were.

Exam tip

When answering questions about a set of numbers, take the time to see what they represent and make estimations about them. When comparing two datasets, for example, look to see if one set has higher numbers than the other. This will give you an idea of what answer you would expect when doing calculations, so you can see if your answer 'seems right'.

Representing and interpreting data

Key terms

Normal distribution: when mean, median and mode are very similar or the same.

Skewed distribution: when median and/or mode differ from the mean.

Frequency scores: the number of times each score is found in a dataset.

Frequency table: shows how often each score in a dataset is found using tallying.

Tally: a way of recording each instance of something using a vertical mark for each instance.

What you will learn

- The characteristics of normal distributions.
- How to construct and interpret tables, diagrams, charts and graphs.
- How to identify a correlation between two variables.
- How to translate information between graphical and numerical forms, plot variables and interpret graphs.

Normal distributions

The way data are spread (distributed) is important when it comes to drawing conclusions about data.

A **normal distribution** is found if the mean, median and mode for a set of data are very similar or exactly the same. When data are normally distributed, 50 per cent of the values are below the mean and 50 per cent above the mean. The majority of scores (around 68 per cent) are equally spread close to the mean, on either side of it (Figure 11.7). The further the scores are from the mean, the less often they occur in a set of data. If the mean, median and mode are not similar, then a **skewed distribution** is produced. Many mathematical statistical tests can only be carried out if data are normally distributed.

Number of colours correctly picked out	Tally	Frequency
0		0
1		0
2	I	1
3	I	1
4	II	2
5	III	3
6	III I	6
7	IIII	4
8	II	2
9	I	1
10	I	1

Table 11.7 Frequency table for the number of times colours were identified correctly

Representing distribution of scores

Here is an example to help explain normal distribution. In a made-up study, 21 participants were asked to describe 10 colours presented on a sheet. They were then given another sheet showing many more colours, including the original 10. They were asked to pick out the 10 colours they had described. **Frequency scores** show how often a particular score was found in a set of numbers. In this study, the frequency score was the number of times the original colours were correctly picked out. The frequency scores are shown in a **frequency table** (Table 11.7). This shows the **tally** for each of the scores to show the number of times that score occurs. The tally totals are the frequencies.

From the frequency table (Table 11.7), you can see that the mean (6.05), median (6) and mode (6) are virtually the same (Figure 11.6), so a normal distribution is expected. This can be shown on a **frequency diagram** or **histogram** (Figure 11.7). A histogram uses touching bars to display the frequency of continuous data, and the shape produced by a normal distribution is called a **bell curve**.

Scores in order: 2, 3, 4, 4, 5, 5, 5, 6, 6, 6, **6**, 6, 6, 7, 7, 7, 7, 8, 8, 9, 10

Mean = $127/21 = 6.05$ to 2 decimal places

Median = **6** **Mode** = 6

Figure 11.6 Descriptive statistics for a study looking at colour identification

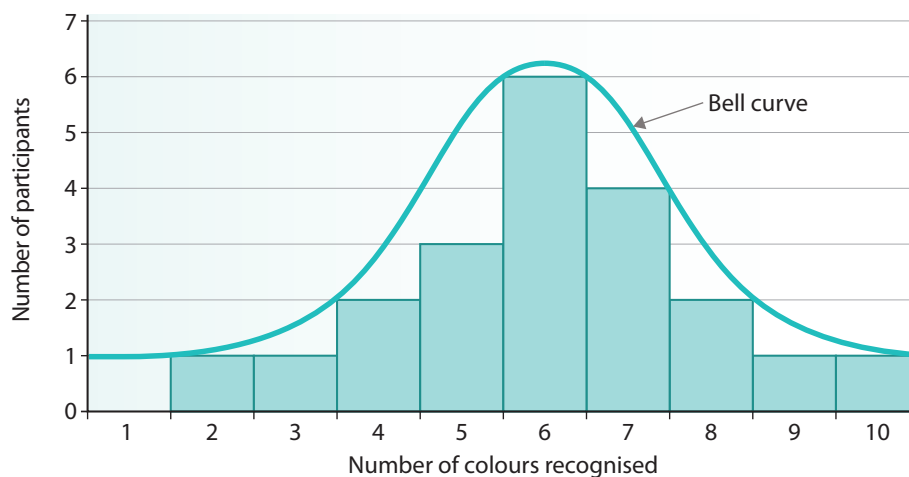


Figure 11.7 A frequency diagram/histogram to show a normal distribution of scores in a study looking at colour identification

Try it

Draw a frequency table and frequency diagram (histogram) for the following data (number of words recalled out of 20 by 30 participants):
2, 6, 6, 8, 8, 8, 8, 10, 10, 10, 11, 11, 11, 11, 11, 12, 13, 13, 13, 13, 13, 14, 14, 14, 14, 15, 16, 16, 18, 18

Maths tip

Take time when doing calculations and drawing up tables and charts. For this Try it, you are given the data in order, but be ready to do this yourself if it is not already done for you. The frequency is how often a number occurs, so that is the place to start. In the exam, you will be provided with graph paper. Use a ruler and pencil to draw the axes and graph, and use your calculator when you need to. Give your graph a title and label the two axes – be sure to make it clear what the numbers represent.

Key terms

Frequency diagram/histogram: illustrates frequency to show the distribution of continuous data.

Bell curve: the shape of a normal distribution curve.

Research methods – How do you carry out psychological research?

Key terms

Bar chart/graph: a graph to show categories of data; a way of summarising data, which can then be compared.

x-axis: horizontal line along the base of a chart/graph.

y-axis: vertical line at the side of a chart/graph.

Scatter diagram: a graph used to illustrate a relationship or correlation between two variables to see if they co-vary.

Histogram	Bar chart
Bars show frequency	Bars show numbers in categories or summarise data such as means, to compare them
Uses continuous scores rather than categories or discrete data	Uses numbers in categories or discrete data, such as means, rather than scores
No spaces between bars	Spaces between bars
Bars can show distribution	Bars show separate categories/things/summary scores

Table 11.8 Histograms and bar charts

Bar charts

A **bar chart/bar graph** uses bars to describe categorical data. As the data are discrete (not continuous), there are gaps between the bars. The categories of data are shown on the **x-axis** (horizontal line along the base) and the scores are shown on the **y-axis** (vertical line at the side). Table 11.8 summarises the differences between histograms and bar charts.

The scores from the earlier study, which looked at the time taken in minutes for males and females to complete a jigsaw (Figure 11.5), can be used as an example of categorical/discrete data. The mean for the males (9 minutes) can be compared with the mean for the females (13.1 minutes) using a bar chart (Figure 11.8). The chart shows that the females on average took longer than the males.

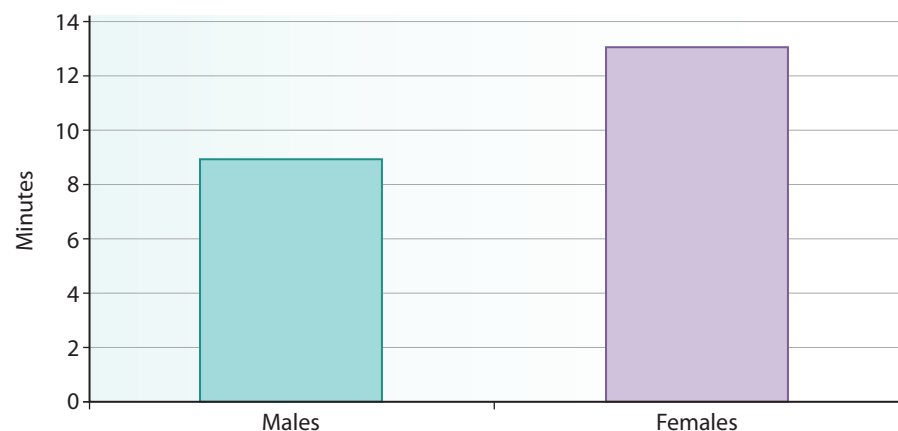


Figure 11.8 Bar chart comparing mean times in minutes for males and females to complete a jigsaw

Scatter diagrams and correlations

A **scatter diagram** is only used for correlation data, to show the relationship between two variables. One variable is plotted on the x-axis and the other variable on the y-axis; the line through the cluster of points indicates whether there is a relationship (connection) or not.

Here is an example to help show how to use scatter diagrams. Keon West et al. (2014) looked at prejudice towards, and contact with, people with schizophrenia. Having contact with someone with schizophrenia meant less avoidance of them. West et al. suggested that if people had more contact with or knowledge of those with schizophrenia, then prejudice might be reduced. Table 11.9 gives some made-up scores relating to this idea.

Link it up

Types of correlations are discussed earlier, in the section *Understanding research methods*.

Participant	Prejudice score (out of 20)	Contact with/knowledge of schizophrenia (out of 20)	Scores ranked (to see if there is a relationship)	
1	5	15	1	12
2	18	2	11.5	3
3	10	8	5	7
4	15	6	8	5
5	8	12	2.5	11
6	10	10	5	9.5
7	18	0	11.5	1
8	16	2	9	3
9	8	2	2.5	3
10	10	10	5	9.5
11	17	8	10	7
12	12	8	7	7

To rank a set of data, start with the smallest number which will be given the lowest rank of 1. Work through the data giving each successive number the next numbered rank. If there is more than one participant with the same score they need to share the ranks out equally. Do this by calculating the average rank for the participants. So when the second and third ranks have the same score they each get 2.5. (If the ranking is done correctly the total of the ranks will be the same as if there were no shared scores, so with 12 participants the ranks should equal a total of 78).

Table 11.9 Data relating contact with/knowledge of people with schizophrenia to prejudice towards those with schizophrenia

Estimation of results and scatter diagram

To see if there is a correlation between two variables, first look at the data to see if it looks likely. Use the ranked scores in Table 11.9. Overall, there seems to be a relationship and as the ranks show differences rather than similarities (for the most part), the relationship seems to be a negative one.

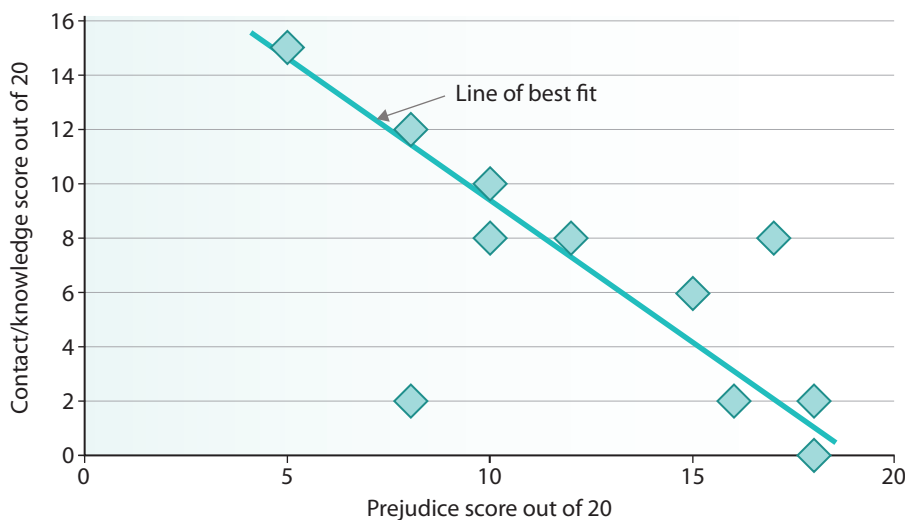


Figure 11.9 Scatter diagram showing a negative correlation between prejudice and contact with/knowledge of those with schizophrenia

Research methods – How do you carry out psychological research?

Key term

Line of best fit: a line on a scatter diagram through the centre of a cluster of points to see if there is a correlation and in which direction (negative or positive) it is.

The **line of best fit** in Figure 11.9 confirms that there is a negative relationship: the less contact people have with someone with schizophrenia, the more likely they are to rate themselves as prejudiced towards people with schizophrenia. This was the finding of West et al.'s (2014) study.

Plotting variables and interpreting graphs

You need to be able to translate information from a table into graphical form (plot variables) and translate graphical information to show it numerically (interpret graphs). Use this Apply it task to practise these skills.

Apply it

Isabella carried out a study on 10 people to see whether the amount of stress they said they were under related to how often they had visited their doctor in the last 12 months. She thought that the more stress they admitted to, the more often they would have visited their doctor. Her data are shown in Table 11.10.

- Draw a scatter diagram to show whether stress levels relate to number of doctor visits.
- Explain whether the scatter diagram shows Isabella found a relationship in her data, and if so, if it was positive or negative.
- Do her findings seem to support her aim? Explain your answer.

Participant	Rating of stress out of 10	Number of Dr visits	Rank: stress rating	Rank: Dr visits
1	2	2	2.5	5.5
2	10	8	10	10
3	1	0	1	2
4	5	0	4.5	2
5	7	3	7.5	7
6	8	5	9	9
7	5	1	4.5	4
8	2	0	2.5	2
9	6	4	6	8
10	7	2	7.5	5.5

Table 11.10 Isabella's data

Types of data

What you will learn

- The difference between primary and secondary data.
- The difference between qualitative and quantitative data.

Primary and secondary data

Primary data is data the researcher has gathered for a specific piece of research. Stanley Milgram (1963) gathered primary data when he recorded voltages in his 'electric shock experiments'. Primary data is gathered for a specific aim, to suit the purpose it is required for. However, this can be expensive, which is a disadvantage.

Secondary data is data a researcher uses data that was gathered previously for a different purpose. In a **meta-analysis**, the data being analysed is secondary data because such research involves collating the results of different studies that ask similar questions and have already been carried out by other researchers. A problem with secondary data is that the original purpose of the data may not quite suit the study that is reusing the data (Table 11.11). It can, however, be cheaper to existing data. For some studies, using secondary data can mean larger sample sizes, such as using a longitudinal study. Caspi et al. (2003), for example, used the Dunedin Multidisciplinary Health and Development Study to find information about genotypes so that they could look at why stress led to depression in some people and not others.

Link it up

Find out more about Milgram's (1963) electric shock experiments in Topic 5 *Social influence*.

Link it up

Find out more about Caspi et al.'s (2003) study in Topic 3 *Psychological problems*.

Similarities	Differences
Both primary and secondary data can be either qualitative or quantitative with associated strengths and weaknesses.	Primary data can be more expensive and time-consuming to gather secondary data are already gathered so are cheaper.
Both primary and secondary data can yield numbers which can be analysed in a similar way.	Secondary data are not gathered for the researcher's purpose whereas primary data are gathered directly for that purpose. This means secondary data might not completely suit the purpose, so there might be a lack of validity.
Studies using primary and/or secondary data must adhere to ethical guidelines.	There might be ethical difficulties in using secondary data from a study that had permission from the participants originally but not for the 'second' study.

Key terms

Primary data: data collected directly for a specific research purpose.

Secondary data: data used in a study that have already been collected, often for a different purpose.

Meta-analysis: a procedure used to merge and analyse findings from studies focusing on a similar issue in order to draw overall conclusions.

Table 11.11 Similarities and differences between primary and secondary data

Research methods – How do you carry out psychological research?

Qualitative and quantitative data

Qualitative data are data in the form of words, pictures or some other format where a story is being told and where the data give detail. Qualitative data is descriptive and gives information that cannot be measured so effectively quantitatively (Table 11.12), such as someone's feelings about their friends. Qualitative data can be gathered through focus groups, observations or case studies. Sigmund Freud's (1909) study of Little Hans and Michel Siffre's (1975) cave study both used qualitative data to explain a situation in detail.

Quantitative data is data in the form of numbers, such as the percentage of people conforming when someone wrongly identifies what line matches another line (Asch, 1951). Studies in psychology often use quantitative data because measurements can be subjected to descriptive statistics and testing. Methods can include experiments or questionnaires. Studies using quantitative data often use large samples and look for patterns in behaviour. Lloyd Peterson and Margaret Peterson (1959) collected quantitative data in their study to test the duration of short-term memory.

Link it up

For more information about Freud (1909) and Siffre's (1975) case studies, see Topic 9 *Sleep and Dreaming*. Peterson and Peterson's (1959) study is explained in Topic 2 *Memory*.

Key terms

Qualitative data: data that are descriptive, not numbers, such as words or pictures

Quantitative data: numerical data.

Exam-style question

Explain **two** differences between qualitative and quantitative data. **(4 marks)**

Similarities	Differences
Both qualitative and quantitative data must be gathered with care to avoid bias and misinterpretation.	Qualitative data tends to come from small samples because of the depth required, whereas quantitative data can have larger samples.
Qualitative and quantitative data can come from the same method at the same time, such as using a questionnaire with both open and closed questions. They both answer the same research aim, in this case, and can back one another up to show validity (and reliability).	Qualitative data tends to come from individuals or small groups and focus on exploring a topic. Quantitative data look for patterns and focus more on differences between individuals rather than sticking to exploration.
Usually qualitative data is said to be less scientific and quantitative data are considered scientific. However, both have to be justified to the reader, such as someone gathering qualitative data by keeping a reflective journal.	Qualitative data gives an insight that quantitative data cannot provide. However, quantitative data can be displayed using descriptive statistics for ease of comparability. Qualitative data can be turned into quantitative data, such as by using numbers in categories. However, quantitative data cannot be turned into qualitative data as the detail is missing.

Exam tip

If there are 4 marks and two 'differences', assume you have 2 marks for each. For each difference, say what it is and then justify your answer. Although an example does not give a difference, it can sometimes help when explaining something.

Table 11.12 Similarities and differences between qualitative and quantitative data

Issues and debates

Ethical issues

What you will learn

- Understand what is meant by 'ethical issues'.
- Use content, theories and research from Topics 1 to 5 to explain ethical issues in psychological research.

Earlier in this topic you looked at five ethical issues: informed consent, deception, confidentiality, the right to withdraw and the protection of participants. Morality is also an ethical issue.

Ethical issues are issues that cover working and living with other people. Ethical principles come from a society's moral stance. They are about what is considered right or wrong. Researchers in psychology must adhere to ethical principles and do what is right. The British Psychological Society (BPS) sets out clear ethical principles both for researchers and for practitioners.

Ethical issues in psychological research

Although Topics 6–10 are also relevant, this section focuses on Topics 1–5 to explain ethical issues in psychological research. These are not the only ethical issues in psychological research, but they will help you with your discussions.

Topic 1 Development

The study of development includes work done by Piaget, Dweck and Willingham, none of whom have been associated with unethical practices. However, there are special ethical issues to consider when children are involved in research. Children should be researched 'with' rather than researched 'on'; Piaget, Dweck and Willingham tended to focus on doing research 'on' children. The children's 'voices', meaning their views and ideas, are not included. To an extent, Piaget and Inhelder (1956) worked 'with' children in their study as their actual responses are noted. However, the children were not asked to contribute to the design of the research or to help with the analysis. Current research in the field of children and young people tends to be more **participatory**, which means it involves the children in the research process.

The United Nations Convention on the Rights of the Child (UNCRC)

According to the UNCRC (1989), children have the right to participate in decisions about themselves (**participation rights**), and it is this right that has led to involving children in research about them. Children also have the right to be protected (**protection rights**), which can be difficult when it comes to doing research, but they must be given that right. The BPS code to minimise harm and the ethical issue of protecting participants are key in this situation.

Link it up

For a discussion of morality issues in psychology and the individual, see Topic 1 *Development*.

Key terms

Participatory: research that involves children and young people from the start, including the design and data-gathering phases, as well as in the analysis.

Participation rights: the rights of people, including children, to participate in decisions about them.

Protection rights: the rights of a child to be protected at all times.

Research methods – How do you carry out psychological research?

Topic 2 Memory

Memory experiments can involve deceit, which is an ethical issue. However, deceit can be involved ethically in a study if there is a thorough debrief. A study that involves deceit will not obtain informed consent prior to the start of the study. However, consent can be given after the debrief, which can help. If Peterson and Peterson (1959), for example, had told participants that the longer the interference task the lower the recall, participants might have acted according to what was said and results might have been affected. If Bartlett (1932) had explained that he expected poorer recall of the story over time and alterations of the story so it made more sense, this also could have affected the results. However, memory experiments do not seem to affect participants strongly with regard to physical or psychological harm, and with a careful debrief they might be seen as ethical.

Ethics committees

Research tends to be carried out in universities, and currently no study can be carried out until there has been a thorough research proposal submitted and approved by an appropriate ethics committee. Most research proposals, where there are no contentious issues, are dealt with at departmental level. If there are any concerns then the proposal is escalated to the University Ethics Committee for consideration. Psychological research can also be carried out within the NHS once the NHS Research Ethics Committee has approved it. While 'older' research, such as Bartlett's (1932) study and Peterson and Peterson's (1959) study, did not go through such stringent ethical scrutiny, current research must. There were, however, ethical guidelines for psychological research early in the 20th Century.

Topic 3 Psychological problems

Research into psychological problems has ethical issues because of the nature of the topic and the participants being studied. However, such research can help people, improving the ethics of studies.

Research into effectiveness of treatments

Young (2007), for example, found that online CBT (cognitive behavioural therapy) helped people with internet addiction – symptoms of internet addiction

improved. It could be said that some research, from an ethical viewpoint, must be done. An issue, however, is that it cannot be known at the start whether a therapy will help, so the rule must be to 'do no harm', which relates to the principle of protection of participants. Also, studies of therapies or treatments tend to have a control group or what is called a 'waiting list' group. These participants do not get the therapy, which could be seen as an ethical problem. However, those on a waiting list will get the treatment if it is found to be successful, countering this issue. There are special ethics when it comes to using a waiting list or a control group.

Research into the effects of genes

Caspi et al. (2003) looked at stress and depression and linked these to genetic make-up. This can raise ethical issues because people cannot help or change their genetic make-up. Further to this, discovering problems with one's genes can be very stressful and upsetting. However, such research can lead to treatment: Caspi et al.'s study helped to shed light on the use of serotonin for depression. The ethics of research into genes is covered by ethics in behavioural genetics research and ethics discussed by the National Human Genome Research Institute. Psychological research that involves genes as an explanation for behaviour has ethical guidelines to adhere to.

Develop it

To find out more, look up ethical considerations in research into genetic influences on behaviour.

Topic 4 The brain and neuropsychology

Research into brain function and how the brain works can raise ethical issues. Ethical issues can arise from the use of case studies where the individual is vulnerable from the brain damage that is being researched. In addition, showing that something results from someone's nature can bring ethical responsibilities, such as responsibility for our actions. Participants must be protected from stress and distress. Informed consent needs to be obtained carefully from someone with damage to the brain.

Case studies of brain-damaged patients

While some studies, such as Damasio et al.'s (1994) study of Phineas Gage, take place after the person's death, other studies into brain damage are carried out during the person's lifetime. This can mix therapy with research, which is an ethical issue. Henry Molaison (HM) was studied for a long time to see what effects his brain damage 'caused' (the case study is briefly outlined in Topic 2 *Memory*). HM was studied to further knowledge in the area of amnesia, but treatment was also sought. There should not be a conflict of interest – treatment should always be the main focus. There are no claims that this did not happen with HM, but the point is still important. Confidentiality, another ethical issue, was given. HM's name was not used until after his death.

Responsibility of researchers looking at the brain and neuropsychology

There are other ethical issues when looking at brain issues to explain behaviour. For example, Raine et al. (1997) studied the brains of people pleading not guilty to murder by reason of insanity and compared PET scans of their brains with a control group. It was found that the 'murderers' did have differences in brain areas such as the pre-frontal cortex. This could be taken to show they were not responsible – it was their 'nature' and their brain differences that were responsible. This shows that researchers who look at the brain and neuropsychology have a responsibility to participants and to society regarding their findings, and this responsibility is an ethical issue.

Topic 5 Social influence

Studies into social influence have led to criticisms of psychological researchers regarding ethics. The very idea of putting someone 'under' social influence itself carries ethical questions.

Protecting participants

Participants must be protected from brutality and from knowing how far they themselves might go. Milgram (1963) got people to give what they thought were dangerous electric shocks to someone else. Beforehand, he asked people whether they thought anyone would go so far as to seriously 'shock' someone they did not know. Nobody thought a participant would go to the maximum shock level. However, that is what happened.

The participants were very stressed and one suffered a seizure. This study was criticised for its ethics, but it should be noted that Milgram did not expect those findings. Haney et al.'s (1973) study has also been criticised. The simulation of a prison had to be stopped because of guard brutality. Psychological studies should not show someone a side of themselves that is scary for them and they should not harm participants.

The ends justify the means

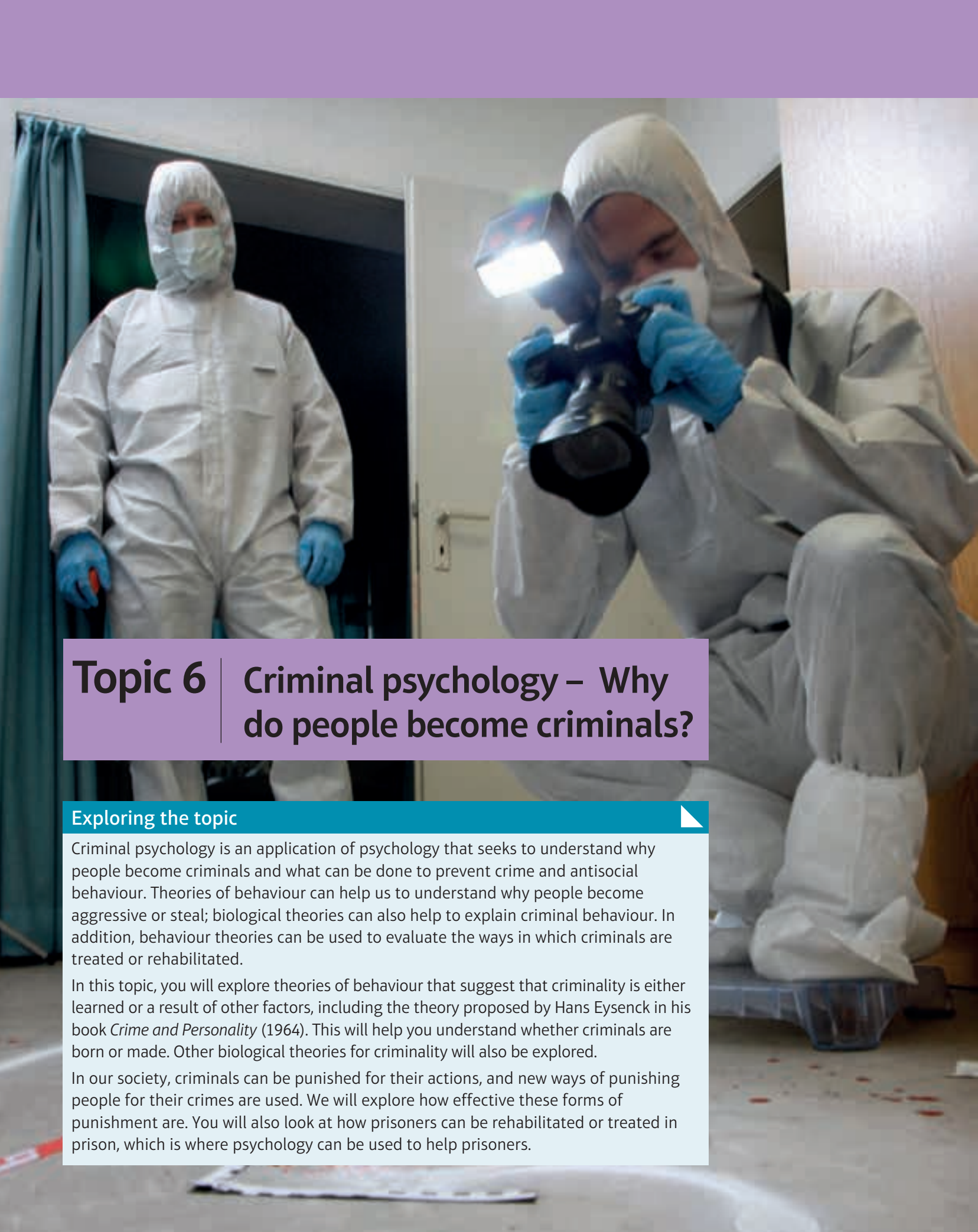
There is an argument that the ends of research justify the means of research. Research is done to improve what is known about people and the interactions between people. Sometimes, therefore, deception and other issues are tolerated. This is a **risk-benefit** view, where the costs of research (financial and other) are weighed against the benefits of the research (Elms, 1994). If there is the right to withdraw at any time, a full debrief, a conclusion that the benefits will outweigh any harm and that any harm is temporary, then deception can be justified in ethical terms.

Key term

Risk-benefit: comparing a study's risks and benefits to ensure the benefits outweigh the risks.

Psychology in action

Research in psychology has benefitted both individuals and society, from using experiments to find out about when people will obey, to asking people to rate the success of the therapy they are undergoing. Research is carefully designed so that the chosen method suits the aims of a study and any weaknesses in a design are balanced by strengths so that findings have value. The way research is carried out has to be controlled, clarified and justified. Analysis of results is also important, and bias must be avoided with careful use of mathematical techniques and means of presentation, as appropriate. Psychology, which is about understanding the brain and behaviour, is only as good as the way information is gathered, which means there must be a careful look at research methods and all they entail.



Topic 6 | Criminal psychology – Why do people become criminals?

Exploring the topic

Criminal psychology is an application of psychology that seeks to understand why people become criminals and what can be done to prevent crime and antisocial behaviour. Theories of behaviour can help us to understand why people become aggressive or steal; biological theories can also help to explain criminal behaviour. In addition, behaviour theories can be used to evaluate the ways in which criminals are treated or rehabilitated.

In this topic, you will explore theories of behaviour that suggest that criminality is either learned or a result of other factors, including the theory proposed by Hans Eysenck in his book *Crime and Personality* (1964). This will help you understand whether criminals are born or made. Other biological theories for criminality will also be explored.

In our society, criminals can be punished for their actions, and new ways of punishing people for their crimes are used. We will explore how effective these forms of punishment are. You will also look at how prisoners can be rehabilitated or treated in prison, which is where psychology can be used to help prisoners.

Your learning

In this topic you will learn about:

- how learning theories can be used to explain criminality
- how biological explanations can be used to explain criminality, including Eysenck's (1964) personality types
- the effects of punishment on whether criminals reoffend
- two ways in which criminals are rehabilitated to encourage prosocial behaviour in prisons: token economy and anger management programmes
- studies investigating criminality by Bandura, Ross and Ross (1961) and Charlton et al. (2000).

Getting started

Think about films you have watched that have depicted a criminal character, or watch an age-certificate appropriate film that has a criminal character. Perhaps the criminal character was aggressive, a fraudster or a thief. How was the cause of the character's behaviour depicted in the film? Were they driven to crime? Did they have an experience during their upbringing, or were they portrayed as evil? Write a list of possible causes of criminality and discuss them with a partner. Consider whether one cause is a better explanation than the others.



Harold Shipman was one of Britain's most prolific serial killers. On 31 January 2000, a jury found Shipman guilty of 15 murders. However, an inquiry commission by a High Court Judge concluded it was likely that he had murdered at least 218 of his patients. What motivated him to commit murder?

Criminal psychology – Why do people become criminals?

Understanding learning theories as an explanation of criminality

What you will learn

- How criminality can be explained by operant conditioning.
- How criminality can be explained through social learning.
- The strengths and weaknesses of these explanations.

Learning theories explain behaviour as a result of the experiences that we have. These theories suggest that criminal behaviour can be explained as a result of learning, like any other behaviour we display. For example, we can learn to behave well in school because we see older peers behaving well or we are rewarded for good behaviour. Similarly, criminal behaviour can be a result of being rewarded or can come from modelling the criminal behaviour we see in others. You will explore these ideas in detail.



Behaviour can be shaped by how we are treated by others. This begins at a young age, but can it be an explanation of adult criminal behaviour?

Link it up

Learning theories can also explain addiction. See Topic 3 *Psychological problems* to find out more.

Operant conditioning as an explanation of criminality

Burrhus Frederic Skinner (1948) developed a theory of learning called **operant conditioning**. He believed that behaviours we display are likely to be repeated if they are reinforced, or extinguished and not repeated again if we are punished.

Operant conditioning explains that there are two types of reinforcement – positive and negative – the consequences of which encourage us to repeat a behaviour we have displayed. In operant conditioning there is reinforcement (which achieves desired behaviour) and punishment (which prevents undesired behaviour). Reinforcements work well when given when the behaviour has been displayed.

- **Positive reinforcement** – we receive a pleasurable or rewarding consequence for our behaviour. We are then likely to repeat the behaviour to get something nice again. In terms of criminal behaviour, if someone receives praise from their family for fighting or for vandalism, or financial reward from committing fraud, then they are likely to commit the crime again.
- **Negative reinforcement** – when a behaviour we display is strengthened by the avoidance of an aversive or unpleasant experience. We are likely to repeat a behaviour that gets rid of something unpleasant. In terms of criminal behaviour, if someone is able to stop a bully by punching them, it is likely that they will use their fists to solve problems in the future.

Key terms

Operant conditioning: learning from the consequences of actions.

Positive reinforcement: receiving something pleasant for a behaviour, so we repeat it.

Negative reinforcement: the avoidance of something unpleasant, so we do it again.

Operant conditioning also explains that punishment is a consequence of behaviour, which means we are less likely to repeat the behaviour again. There are two types of punishment.

- **Positive punishment** – receiving a negative consequence for a behaviour, such as a child being told off by a parent for not keeping their bedroom tidy. This is often the way that we treat criminal behaviour. If someone does a criminal act and is fined or imprisoned, they are being positively punished.
- **Negative punishment** – taking away something pleasant as a consequence of a behaviour that is not desired. For example, if a child is disruptive at a birthday party, which they are really enjoying, a parent can remove them from the party to sit in the corner. In terms of criminal behaviour a person may enjoy being part of a gang. The gang may start to vandalise public property but because the person does not want to join in, they are told to leave the gang. The undesired behaviour of not vandalising property is punished.

The state uses both positive punishment and negative reinforcement. For example, if someone commits fraud and is put into prison, they are receiving positive punishment for their actions. When they are released from prison, they should avoid committing fraud because they do not want to be imprisoned again: this would be negative reinforcement.

Operant conditioning explains that there are two types of positive reinforcers that can be used as a consequence for behaviour to strengthen behaviour.

- **Primary reinforcers** – these satisfy a basic biological need, such as food and water. A parent may reward a child with food treats for behaving well, for example. Although it is unlikely that most criminals commit crime for primary reinforcers, people who are in extreme poverty or are starving may resort to committing a crime, such as theft, in order to satisfy a basic need.
- **Secondary reinforcers** – these are common reinforcers, such as school grades and tokens. These reinforcers often have no survival value, but we have learned to associate them with a primary reinforcer. A good example of a secondary reinforcer is a credit card. The card itself has no intrinsic value but it can be used to buy goods, which are rewarding or satisfy a basic need such as food and warmth.

Key terms

Positive punishment: receiving something unpleasant for a behaviour, so we do not do it again.

Negative punishment: removing something pleasant so we do not repeat the behaviour again.

Primary reinforcer: a reinforcer that satisfies a biological need.

Secondary reinforcer: a reinforcer of no survival value, but we have learned to associate it with a primary reinforcer.

Apply it

Two siblings enjoy watching their favourite television programmes. They begin to fight over the remote control, so their parents send them to their bedroom.

Explain what kind of reinforcement is shown in this example.

Exam-style question

A school tutor group is collecting money for charity. The collection box is kept at the back of the room. One day, Richard notices the tutor room is empty and takes a pound coin from the box. Each day Richard returns and takes another pound coin.

Explain what type of reinforcer is shown in this example.

(2 marks)

Exam tip

Take care to read the question carefully and distinguish between the type of reinforcer and type of reinforcement.

Criminal psychology – Why do people become criminals?

Strengths and weaknesses of operant conditioning

A strength of operant conditioning is that the theory can be used to explain a wide range of crimes. For example, it explains theft and how social approval can be a strong reinforcer in peer groups that encourage deviant behaviour through positive reinforcement. It can also explain some murders. For example, a man may find out that his friend is stealing from him; he attacks him, and the friend dies. This is negative reinforcement as it removes the aversive situation.

Operant conditioning also explains that punishment can remove an undesirable behaviour. This is used in our criminal justice system – offenders are punished through the removal of their civil liberties. It has also contributed to the development of behaviour management techniques, such as token economies. These systems reward good behaviour in prison with tokens that prisoners can exchange for goods or treats.

Link it up

Token economy programmes are discussed later, as a form of treatment to rehabilitate and reduce criminal behaviour and increase prosocial behaviour. Read ahead to find out more.

A weakness of the operant conditioning explanation is that not all crimes are committed because of receiving reinforcement or punishment; it is often more complicated than that. The theory of operant conditioning neglects other factors that can cause criminal behaviour, such as the type of personality someone has or their genetics.

Another weakness is that behaviour can be reproduced in the absence of reinforcement or punishment. A big part of whether someone chooses to commit a criminal act can be due to the way they think or a different form of motivation than reward. If an employee feels as though they are not valued in their job, they may choose to steal stationery to get back at their employer. Operant conditioning, in this example, does not consider an alternative motivation for crimes.

Social learning theory as an explanation of criminality

Social learning theory is a social theory because it explains that we learn from one another, rather than directly from reinforcement or punishment. Albert Bandura (1977) explains behaviour as a consequence of observing and **modelling** others around us. This is known as **observational learning**. We do not just copy anyone; we are motivated to copy those with whom we share similar characteristics. This person becomes a **role model**. From observing a role model, we can learn how new behaviours are performed; this is known as modelling. This may or may not lead to a change in behaviour.

Key terms

Social learning theory:

behaviour is learned through the observation and imitation of role models.

Modelling:

learning a new behaviour through paying attention to, retaining and reproducing the behaviour of a role model.

Observational learning:

learning new behaviours through watching and modelling a role model.

Role model: a person who we admire or with whom we share similar characteristics.

The identification and modelling process

- **Attention** – in order to learn something new, you must be able to, and want to pay attention to it.
- **Retention** – for learning to take place, you must be able to store or retain the new behaviour in your memory.
- **Reproduction** – to be able to model the new behaviour that you observed, you need to be able to reproduce it. So you may watch a gymnast do a backflip, and you could have paid attention and retained the way in which the move was performed, but you will not be able to reproduce it without agility and practice.
- **Motivation** – you are more likely to model a behaviour you have observed someone do if you are motivated to reproduce it. This motivation can be intrinsic, in that you gain pleasure from copying it. It could also be that you see the role model receiving a reward for this behaviour so you copy it in order to receive the same reward. This is known as **vicarious reinforcement**.
- **Identification** occurs when you adopt the behaviour, beliefs and values of the role model or group.

Social learning theory can be used to explain criminal behaviour. If a person is exposed to criminality, such as a child living in a violent household, then they are more likely to pay attention and retain this. Parents and television characters can be strong role models. If a child is exposed to criminality, they are more likely to model the behaviour, particularly if the role model appears to be rewarded for their activities.

Strengths and weakness of social learning theory

There is a lot of evidence to support the social learning of aggressive behaviour. Bandura (1960s) conducted a series of experiments that exposed nursery-aged children to an aggressive role model. He found that aggression was copied, especially if the role model was the same sex as the child and if the role model was rewarded for their aggression.

Observational learning is one of the main ways that children learn new behaviour and can explain this behaviour in the absence of reinforcement, which is another strength. Some behaviour does not become

learned through consequences; we can simply watch and imitate.

A further strength is that the theory can explain why some people exposed to criminality become criminals and others do not. It does this by explaining that although a behaviour may have been observed, the motivation to model the behaviour by committing a crime may be absent, so they will not copy it.

Link it up

Bandura's (1961) research is discussed in the *Studies* section. Read ahead to find out more.

Although experimental evidence, such as the studies conducted by Bandura, shows how children learn aggressive behaviour from a role model, such studies can only measure the short-term effect. We cannot ethically test whether exposure to aggression can have long-term effects. This is a weakness of the theory because it cannot be tested in real-life situations.

Some criminal behaviour cannot be explained by observational learning. Murder, for example, is rarely witnessed in real life. It cannot explain opportunistic crime that has not been observed by the criminal. Similarly, it is unlikely that fraud is learned through observation as it is typically driven by financial gain.

Apply it

A group of friends are shopping in town. One of the friends shoplifts some clothes and shares the stolen goods among them. The others think the shoplifter is 'cool'.

Using your knowledge of social learning theory, explain what might happen the next time the friends are out shopping.

Key terms

Vicarious reinforcement: motivation to model the behaviours of others who we see being rewarded for their behaviour.

Identification: temporarily adopting the behaviour of a role model or group.

Criminal psychology – Why do people become criminals?

Link it up

For more information about the biological basis of behaviour, the human brain and the nervous system, see Topic 4 *The brain and neuropsychology*.

Key terms

Monozygotic twins: twins developed from one fertilised egg that has split into two; monozygotic twins are genetically identical.

Dizygotic twins: twins developed from two different eggs fertilised during the same pregnancy; dizygotic twins are not genetically identical.

Biological explanations of criminality

What you will learn

- How criminality can be explained by biological explanations.
- The personality types: extraversion, introversion, neuroticism and psychoticism.
- The strengths and weaknesses of personality theory as an explanation of criminality.

Biological explanations of criminality do not take learning experiences into account. Instead, they explain criminality as a result of our biological systems, such as our brain and nervous system, genes and hormones.

Biological explanations have been used to explain criminality throughout the history of psychology. Early theories believed that criminals had certain body types and facial characteristics that indicated whether they were criminal and what type of crime they would be likely to commit. Although these theories have largely been discredited, there are still explanations for criminal behaviour that examine whether crime runs in families. There are also theories that link certain genes to aggression.

Genetic explanations for criminality

Studies have found that criminality runs in families. However, such evidence is undermined by the possibility that upbringing might account for these findings or that a social factor, such as poverty, may explain the tendency for criminality to run in families. More reliable evidence has been found using twin studies. If identical twins (**monozygotic**) are both more likely to be criminals compared to non-identical twins (**dizygotic**), then there could be some evidence that criminality has a genetic basis. Karl Christiansen (1977) found that 35 per cent of identical male twins recorded in Denmark were both criminals compared to 13 per cent of non-identical male twins. For female twins, the figures were 21 per cent of identical twins and 8 per cent of non-identical twins. However, identical twins are likely to be raised in a more similar way than non-identical twins (who may be a different sex). This shared upbringing could explain the slightly higher percentage of identical twins who are both criminals compared to non-identical twins.

One way to rule out the potential influence of upbringing is to use evidence from adoption studies. Here, the biological and adoptive parents are compared to the child in terms of whether they have criminal records. Assuming that the child has been adopted at an early age, we can then assume that any similarity between the biological parent and child is inherited. Barry Hutchings and Sarnoff Mednick (1975) found that 21 per cent of adopted children who went on to commit a crime had a biological father who was convicted of a crime. This was compared to 10 per cent of children whose biological father was not convicted of a criminal offence but the adoptive father had a criminal record. However, we should be wary of interpreting this as a biological basis for criminality. It could be some other tendency or attribute that has been inherited, which may explain why some adopted children turn to crime.



Cesare Lombroso (1890) explained that criminals could be distinguished from non-criminals by their prominent facial characteristics. Do you agree with Lombroso that criminals are born and not made?

Develop it

Conduct an internet search to find out about other biological theories of criminality. You may find that genetics, the MAOA 'warrior' gene and testosterone have been linked with criminality and aggression. Is there any solid evidence that criminals are born and not made?

Personality theory

Our **personality** is the set of characteristics that determine what we are like. Some personality theories believe that our personality is a **temperament**, which has a biological basis. These theories can explain how some personalities are associated with being a criminal, while others are not. They suggest that a criminal personality trait is caused by internal, biological factors.

One such theory was proposed by Hans Eysenck (1964). Eysenck studied different personality traits and suggested that certain characteristics could be more prone to criminality.

Link it up

Personality theory, temperament and trait theory are discussed in more detail in Topic 7 *The self*.

Personality traits

- **Extraversion/introversion** – two extreme ends of one dimension of personality; extraversion is being outgoing and sociable and is at one end of the dimension, whereas introversion is at the other end, being reserved and quiet.
- **Neuroticism** – this refers to the nervous disposition of someone. If they are stable, then they are calm and do not over-react in situations. If they are unstable, they tend to be highly emotional and quick to over-react.
- **Psychoticism** – this is a personality trait that shows a lack of empathy towards others.

Measuring personality

Each personality trait can be measured using a questionnaire devised by Eysenck, called the **Eysenck Personality Questionnaire (EPQ)**. Each question in the EPQ measures the specific traits of extraversion/introversion (E), neuroticism: stable/unstable (N) and psychoticism (P), and gives them a PEN score.

Key terms

Personality: characteristics and qualities that make up someone's individual character.

Temperament: the nature someone is born with, which affects their behaviour.

Extraversion: behaviour that is outgoing, sensation-seeking and sociable.

Introversion: behaviour that is reserved, calm and quiet.

Unstable neuroticism: a personality trait associated with being over-reactive in stressful situations, over-emotional and anxious.

Stable neuroticism: a personality trait associated with being unreactive in stressful situations and emotionally unaffected.

Psychoticism: a personality trait that is cold, lacks empathy, is antisocial and can be aggressive.

Eysenck's personality questionnaire (EPQ): a questionnaire to measure extraversion, introversion, stable and unstable neuroticism, and psychoticism.

Try it

You can find out your own personality traits using online questionnaires based on the EPQ.

The biological basis of personality

People with a high E score on the EPQ are believed to have a nervous system that has a low arousal level, so they seek external stimulation to raise their biological arousal level. They do this by being outgoing and sensation-seeking. People with low E scores are believed to have a nervous system characterised by high arousal, so they avoid thrill and excitement in order to dampen their biological arousal level.

Unstable neurotics have a high N score and are believed to have a nervous system that responds very quickly under stressful conditions; they tend to over-react quickly. In contrast, people with low N scores have an unreactive nervous system, meaning they are calm under stressful conditions.

Although Eysenck was less clear about the biological basis for psychoticism, he believed it was also linked to our biological make-up. Having a high P score means that a person is cold, lacks compassion and can be antisocial.

Criminal psychology – Why do people become criminals?

Key terms

Socialisation: the way you are raised and taught how to behave.

Holism: the theory of explaining something as a whole.

Sociologist: a type of researcher interested in the effects of social conditions on behaviour and societies.

The criminal personality

Most people have moderate PEN scores. This means that they score moderately on psychoticism, extraversion and neuroticism. High PEN scores are relatively uncommon and have been used to explain criminality. However, this theory is not completely about our biological make-up. It also explains how the PEN personality traits interact with how we are raised. This is called the process of **socialisation**. As we grow up, we are punished for antisocial behaviour. We learn to associate misbehaving with the anxiety of being punished.

The theory explains that people with a high PEN score have a biological nervous system that is more difficult to socialise because they do not associate their antisocial behaviour with the anxiety of being punished. Remember that these personalities are quick to react, sensation-seeking and lack empathy for others. This means that antisocial behaviour is exciting and they do not consider other people's feelings. Punishment for antisocial behaviour is therefore not very effective in controlling their behaviour.

Strengths and weaknesses of Eysenck's theory

One strength of this theory is that there is evidence that people with these personality traits are associated with criminal behaviour. If we compare the PEN scores of convicted criminals to non-criminals, we should find that criminals have higher PEN scores. David Farrington et al. (1982) reviewed lots of studies that compared offenders with non-offenders. They found that there was a relationship between high P and N scores and criminal behaviour, but there was no relationship found between high E scores and criminality. This provides some support for personality theory as an explanation for criminal behaviour.

Another strength of Eysenck's personality theory of criminality is that it combines biological (genetics and the nervous system), psychological (traits) and social (upbringing) factors into one theory. So, rather than focusing on one explanation, it integrates all levels of explanation. It is therefore more **holistic** in its approach to explaining criminal behaviour.

A problem with personality theory as an explanation of criminality is that it tends to assume that personality traits are fixed and stable. Traits that have a biological basis within our nervous system are viewed as unchanging throughout life. However, it is possible that we change our behaviour according to the situation we are in. Criminality can therefore be considered to be more about environmental conditions than personality traits. **Sociologists** would agree that social conditions, such as poverty, are more likely to cause criminal behaviour than the type of nervous system we possess.

Much of the evidence used to support the personality theory of crime is based on self-report questionnaires. This evidence may be flawed because people tend to answer questions about themselves in a way that best reflects desirable characteristics rather than undesirable ones. Furthermore, the evidence that comes from offenders only represents offenders who have been caught and convicted for their crimes, not the successful ones. Questionnaire evidence for this theory can be seen to be unreliable for these reasons.

Link it up

For more about the reductionism and holism debate, see Topic 2 *Memory*.

Apply it

Jerome was calm and quiet as a child and was not known for misbehaving, while his friend Kiran was outgoing, took risks and did not like being told how to behave. Using your knowledge of Eysenck's personality theory, explain which child is more likely to turn out to be a criminal when they grow up.

Link it up

For more information about questionnaires, see Topic 11 *Research methods*.

Understanding the effects of punishment on recidivism

What you will learn

- The types of punishment used to deal with offenders.
- The strengths and weaknesses of each form of punishment.

Recidivism refers to the rate criminals reoffend. An offender who has been caught and punished for a crime and then goes on to commit another offence after being released is known as a recidivist. Recidivism has been linked to the way in which offenders are punished for their crimes. In particular, whether or not their punishment encourages recidivism or if it is in some way **rehabilitative**, so is likely to decrease rates of recidivism.

Prison

Offenders can be punished for their crimes in various ways. A typical sentence for a serious criminal act is imprisonment. This is when an offender is placed in a prison and denied civil liberties, such as freedom and privileges, for a period of time determined by the court. The period of **detention** (or **custody**) is usually dictated by the type of crime committed, for which a sentence is received. The more serious the crime is, the longer the period of custodial sentence.

Punishment can be said to be effective because it is based on the principles of operant conditioning, which demonstrates that positive punishment can be used to stop a behaviour occurring again. Prison is a form of positive punishment given to an offender that should prevent them from reoffending. Prison also acts as a deterrent for potential offenders so is a form of negative reinforcement: people will avoid prison by abiding by the law. However, some people may commit a crime in order to be put into prison because they find stability, routine and friendship there. Prison could be a positive reinforcement for these people.

Key terms

Recidivism: when an offender is punished for their crime but commits another crime when released (rate of reoffending).

Rehabilitative: a programme designed to help offenders rather than punish them.

Detention/custody: a prison sentence.



Offenders can receive a prison sentence as punishment for their crimes. How effective do you believe prison is for preventing crime and reoffending?

Criminal psychology – Why do people become criminals?

Strengths and weaknesses of prison as a deterrent to reoffending

Prison can be said to be effective because it removes a criminal from public life, so they do not have the opportunity to commit a crime as they are highly regulated within the prison walls. However, it does not totally prevent reoffending after the sentence has been served. Recidivism rates in the UK show that within the first year of release, around 25 per cent of people reoffend. The figures differ between age groups and for different types of crime. Young offenders and criminals who commit crimes of theft are more likely to reoffend. With such high recidivism rates, we must question whether prison is an effective form of punishment.

A strength of prison as a punishment for criminal behaviour is that it keeps the public safe while the offender is locked away. This can be reassuring for the public and reinforces the moral view that crimes will be punished to ensure civil order. It is also based on the learning theory of operant conditioning, which predicts that behaviour that is punished will not be repeated.

Imprisonment may be seen as an ineffective form of punishment for crime because prisoners are exposed to criminal role models while serving their sentence. These role models may commit crimes within prison and may reward other inmates for breaking prison rules. The reinforcement for committing crime within prison may outweigh the punishment that prison serves for crime. Once released, prisoners often find it difficult to get a job because of their criminal record, so are more likely to turn to crime as a way to financially support themselves. For this reason, prison may be seen as an ineffective form of punishment.

As a punishment for crime, prison raises ethical issues because civil liberties are removed from prisoners. This is a moral issue; some people believe that it is immoral to lock someone up for many hours a day and remove their basic rights and privileges. **Humanitarian** views would argue that rehabilitation is better than imprisonment.

Apply it

Tom committed fraud and was given a custodial sentence. He spent 2 years in prison and, when he was released, he committed theft. Tom was sentenced to a further prison sentence.

Using your knowledge of the effectiveness of prison, suggest why Tom may have reoffended after he was released from prison.

Key terms

Humanitarian: a concern with the welfare of humans.

Community sentencing: when an offender serves a sentence in the community rather than in prison; they have to pay back the community by doing jobs such as removing graffiti.

Curfew: having to be home at certain times, such as between 7 a.m. and 7 p.m.

Community sentencing

A **community sentence** is when you are convicted of a crime and have to do community service rather than go to prison. Community sentencing is more common for minor offences, first offences or if a court does not think a custodial sentence is appropriate. Community service can involve voluntary work or unpaid work in the community, such as litter picking or painting community buildings. Sometimes this is referred to as community payback.

In addition to community service, an offender may be given a **curfew**, be restricted from certain areas and have to report to a community offender manager. If an offender does not meet the requirements of the community service order, they may have to serve a custodial sentence in prison.

Strengths and weaknesses of community sentencing as a way to reduce reoffending

The strengths of community sentencing are that offenders can be given a second chance to make up for their crime by giving something back to their community. It can also prevent a new offender going to prison, where they may make criminal connections and get involved with more serious crimes. The theory is that they will be less likely to reoffend if they are not exposed to criminal influences.

Another strength is that, because community sentences are only given in appropriate circumstances, they may be more suitable punishments than imprisonment. This may result in the offender being less likely to reoffend because they have avoided prison, which is a form of negative reinforcement.

However, a weakness is that some view community sentencing as a soft option. With a recidivism rate of over 30 per cent, it is not seen as an effective form of punishment and cannot be used as an alternative to imprisonment. Despite curfews and restrictions, an offender may still be able to engage in criminal activity as they are not locked away from society. This means the likelihood of reoffending is high both during and after the community sentence.

One reason for the low success rate of community sentencing is that over 10 per cent of offenders fail to complete their community sentence. This may be because they break their curfew, fail to show up for community service or are convicted for further offences.

Restorative justice

Restorative justice is a practice that involves an offender meeting up or communicating with the victim or people they have harmed by their crime. This could mean a burglar would meet residents from whom they have stolen. This can help both the offender and the people harmed by crime. The offender can realise that their actions had a negative effect on others, which may help them accept responsibility. Those harmed by crime may have their chance to let the offender know how they feel or ask them questions, which can be a relief. Clearly, this process can cause distress to both an offender and the person harmed by a crime, so it is conducted in an informal and neutral environment where the people involved can feel safe.

Key term

Restorative justice: when a victim and offender meet; it is a process used to help a victim recover and make an offender understand the impact of their crime.



Do you believe that an offender should meet the victim? Think of strengths and weaknesses of this.

Criminal psychology – Why do people become criminals?

Develop it

The Restorative Justice Council (RJC) have real-life examples of restorative justice in action. These case studies can help you understand how it can be useful for individuals. First, find the principles of restorative practice on the RJC website and then see how the case studies adhere to the principles.

Strengths and weaknesses of restorative justice as a way to reduce reoffending

According to government research, restorative justice has a high victim satisfaction rate of around 85 per cent. This is a strength because it shows that victims are able to ask questions and communicate their point of view to an offender, which may make them feel empowered and more able to move on with their lives. However, it does not take away the fact that they have been a victim of crime. This shows that restorative justice may be more beneficial for the victim rather than a way of reducing recidivism.

Although restorative justice is not a form of punishment, government research has shown that there is a 14 per cent reduction in recidivism, compared to not using restorative justice. However, as the offender has to undertake restorative justice voluntarily, the reduction in reoffending may just reflect that the offender was already contemplating a crimeless life.

A weakness is that the process of restorative justice can cause distress to both offender and victim as it involves personal contact via a face-to-face meeting or by letter. However, the mediator of restorative justice will decide whether the process will be helpful and safe, and which form of contact takes place to ensure the least amount of distress is felt. This safe environment means that an offender can contemplate their crimes and may lead to a reduction in reoffending.

The process of mediation involved in restorative justice can be time-consuming and costly. However, a recent review by the Ministry of Justice found that the cost involved in using restorative justice is less than the cost involved in dealing with reoffending.

Apply it

Benjamina was a victim of burglary and did not feel safe in her house afterwards. She was contacted to see whether she would be willing to take part in a restorative justice programme and communicate with the offender who burgled her home.

Using your knowledge of restorative justice, explain what experiences Benjamina and the burglar might have in this process.

Treatments to rehabilitate and reduce criminal and antisocial behaviour and increase prosocial behaviour

What you will learn

- Two treatments used to rehabilitate and reduce criminal and antisocial behaviour and increase prosocial behaviour.
- The strengths and weaknesses of these treatments.

Offenders who serve time in prison or carry out a community sentence may also receive treatments designed to rehabilitate them, reduce their antisocial behaviour and/or encourage prosocial behaviour.

Token economy programmes

Token economy programmes are designed to reduce antisocial behaviour and increase prosocial behaviour within a prison. Token economy programmes are based on the principles of operant conditioning, as prisoners are given tokens for prosocial behaviour as a form of reward/reinforcement. Prosocial behaviour is when a prisoner is cooperative or compliant with prison staff.

Tokens are secondary reinforcers. Once a prisoner has collected a certain amount, they can exchange them for rewards such as telephone calls, television time, visits and food privileges. For a token economy programme to work, the rewards must be genuinely valued by the prisoner and the tokens should be given as soon as a prosocial behaviour has been displayed.



How effective do you think rewards for prisoners are in managing their behaviour?

Develop it

Conduct your own research to find out what would be involved in setting up a token economy programme within a prison.

Strengths and weaknesses of token economy programmes

Token economy programmes are designed to control and manage prisoner behaviour, not to reduce recidivism. They are unlikely to prevent reoffending because similar tokens are not found in everyday life beyond the confines of the prison walls, so prosocial behaviour is likely to be limited to the prison setting. This means that they have limited rehabilitative value.

However, there has been evidence of a short-term increase in prosocial behaviour within a prison. Tom Hobbs and Michael Holt (1976) introduced token economies to three prisons for young offenders. Compared to a control prison, which did not use tokens, they found that targeted prosocial behaviour, such as queuing for dinner correctly, cooperating and doing chores, significantly increased.

Compared to other forms of rehabilitation, which can involve the use of counsellors and criminal psychologists, token economies are fairly economical and can be administered by prison staff. However, they do need commitment from prison staff and prisons for them to work. Failure of staff to give out tokens can result in antisocial behaviour, particularly as there are other sources of reinforcement from other inmates, who may encourage antisocial behaviour. These may be stronger sources of influence than tokens.

Apply it

Greenlink Prison is considering using a token economy programme to manage the behaviour of inmates.

Using your knowledge of token economy programmes, explain what Greenlink Prison will need to consider when setting up this programme.

Key term

Token economy programme: a programme designed to reward prisoners for prosocial behaviour; prisoners collect tokens that can be exchanged for privileges.

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Anger management programmes

Anger management programmes are designed as a form of rehabilitation for offenders who have committed violent crimes because of their anger. The treatment involves offenders working with a therapist in small groups. During the treatment, offenders are encouraged to identify triggers to angry outbursts, to find ways of coping with their feelings and to gain the ability to resolve conflict situations in a better way than becoming angry. This is a three-stage process:

- 1 Cognitive preparation – where an offender has to reflect on their own anger: what makes them angry, why they feel angry and how feeling angry may be counter-productive.
- 2 Skills acquisition – an offender learns new skills to help them control their anger. They can learn relaxation techniques or assertiveness training (so they can assert their point without resorting to anger).
- 3 Application practice – this stage involves role playing anger-triggering situations, so that an offender can practise their new skills.

Develop it

H.M. Prison Service uses a range of Offender Behaviour Programmes (OBPs) that include treatments to help regulate emotions. These are commonly called cognitive behavioural techniques because they help identify and modify thinking patterns that influence behaviour. Many of these OBPs can be found on the H.M. Prison Service website. See if you can identify anger management programmes on their list.

Strengths and weaknesses of anger management programmes

The treatment assumes that there is a link between anger and violent crimes, but not all violent crimes are committed due to anger – some violent criminals can be cold and calculating. However, offenders are carefully selected to receive anger management, which is a strength, so this problem should not really affect the success of the treatment.

One weakness of anger management is that offenders can abuse the programme. The programme teaches offenders to control and manage their anger, a skill that may be used to commit crimes more effectively than before. Marnie Rice (1997) suggested that **psychopaths**

were more likely to reoffend and become more dangerous after anger management because they had acquired new skills on the programme that helped them manipulate others more effectively.

In terms of the effectiveness of anger management in reducing recidivism, the findings are mixed and limited. Craig Dowden, Kelley Blanchette and Ralph Serin (1999) found that high-risk offenders who received anger management treatment were less likely to re-offend compared to high-risk offenders who did not undergo intensive anger management treatment. However, Kevin Howells et al. (2005) did not find any improvement other than the treated offenders having a greater understanding of anger, suggesting an educational benefit. This is a serious weakness of anger management programmes.

These mixed outcomes are probably because anger management programmes need offenders to be highly motivated, have good insight and understanding of themselves, and be able to practise their anger management skills. Limitations in these factors may result in programme failure.

Key terms

Anger management programme: cognitive behavioural treatment for violent offenders to help them control their anger.

Psychopath: a person who is characterised by a lack of guilt and emotion, antisocial behaviour and selfishness.

Exam-style question

Joe had trouble controlling his emotions. One night he was out with his friends when a group of people started taunting them. Joe became very angry and violent, which resulted in him attacking some of the people in the group. Joe was convicted of assault and recommended for anger management treatment.

Explain how the treatment might be described to Joe before he begins rehabilitation, using your knowledge of anger management programmes. **(4 marks)**

Exam tip

It is important to engage with these application-style questions, so in this case do not just describe anger management. Instead, detail how it would be explained to Joe in the context of his anger in this situation.

Studies

Bandura, Ross and Ross (1961) Transmission of Aggression through Imitation of Aggressive Models

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Albert Bandura, Dorothea Ross and Sheila Ross were influenced by previous research that demonstrated that children could learn incidentally through the mere observation of another. They were also interested in sex-appropriate behaviour. Children tend to be rewarded for sex-appropriate behaviour and punished for sex-inappropriate behaviour. For example, girls would be rewarded for role-playing housework, but punished for rough-and-tumble play. These sex-appropriate behaviours would have been reinforced throughout childhood and therefore children would be more likely to be in the habit of imitating same-sex role model behaviour.

Aims

To see if children would imitate aggression that was role-played by an observed adult. The researchers were specifically interested in whether the sex of the role model and sex of the child would be an important factor in whether a child would imitate aggression or not. As aggression is considered to be a male behaviour rather than a female one, they were interested to see whether sex influenced the likelihood of aggression being imitated.

Procedure

There were 36 girls and 36 boys, aged between 37 and 69 months, recruited from Stanford University Nursery School for the study. They were divided into 8 groups of 6 children and a control group of 24 children. The control group did not observe a model. Four of the experimental groups were exposed to an aggressive model and four were exposed to a non-aggressive model. These were further divided into male and female children who observed either a male or female model.

All the children were allocated to conditions to ensure each group was equally matched regarding aggression (see Table 6.1). They were rated for aggression from observations of their behaviour by an experimenter and their teacher in the nursery school.

A female experimenter brought each child individually to an experimental room at the nursery and placed them at a table in the corner to play with potato prints and toys. The experimenter then invited the role model into the room to play with the toys in the opposite corner. This corner of the room contained various toys, including an inflatable Bobo doll (Figure 6.1).



Figure 6.1 Was the Bobo doll designed to be knocked over?

Male participants ($n = 6$)	Observed aggressive male model	Female participants ($n = 6$)
Male participants ($n = 6$)	Observed aggressive female model	Female participants ($n = 6$)
Male participants ($n = 6$)	Observed non-aggressive male model	Female participants ($n = 6$)
Male participants ($n = 6$)	Observed non-aggressive female model	Female participants ($n = 6$)
Control group ($n = 24$)	Did not observe any model	

Table 6.1 Conditions of the experiment

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The experimenter left the experimental room and the model began playing with the toys. In the aggressive condition, after about 1 minute, the model played aggressively with the inflatable Bobo doll. The model punched the doll on the nose, tossed and kicked the doll, and used a mallet to strike it. During the assault, the model repeated aggressive phrases, such as 'Kick him' and 'Pow'. After 10 minutes, the model left the room. Each child was taken to a different room and allowed to play with more toys. These toys were highly attractive, but the child was told after 2 minutes that they were not to play with them anymore. This was to ensure that the initial exposure to aggression did not prevent the children from displaying aggression because of the tendency to control our aggression after witnessing it.

Each child was then taken into an adjacent room which contained toys that they were permitted to play with. The room contained mostly non-aggressive toys and the Bobo doll. Each child remained in the room for 20 minutes, during which their behaviour was observed and recorded through a one-way mirror. The recordings were analysed at 5-second intervals and any behaviour, physical and verbal, aggressive or non-aggressive, was recorded. The behaviours were also classified as 'imitative', for any behaviour that the child copied directly from the role model, or 'non-imitative', for any novel/non-observed behaviour the child displayed.

Results

Children who were exposed to the aggressive role model, whether male or female, displayed more aggression than the control group or children exposed to the non-aggressive role model (Table 6.2). This suggests that children imitate aggression. This was true for both physical and verbal aggression. Children also displayed non-imitative aggression, suggesting that they were devising new ways of being aggressive.

It was also found that boys were far more likely to copy the same-sex aggressive role model in terms of imitating physical aggression than girls. However, girls were equally as likely as boys to imitate verbal aggression of a same-sex role model.

In terms of the non-aggressive behaviour that the researchers scored, they found that girls spent significantly more time playing with dolls and the tea set, while boys spent more time with a toy gun.

Mean number of aggressive acts		Aggressive role model		Non-aggressive role model		Control group
		Female model	Male model	Female model	Male model	
Imitative physical aggression	Female child	5.5	7.2	2.5	0.0	1.2
	Male child	12.4	25.8	0.2	1.5	2.0
Imitative verbal aggression	Female child	13.7	2.0	0.3	0.0	0.7
	Male child	4.3	12.7	1.1	0.0	1.7
Non-imitative aggression	Female child	21.3	8.4	7.2	1.4	6.1
	Male child	16.2	36.7	26.1	22.3	24.6

Table 6.2 Mean number of aggressive acts

Conclusions

This research demonstrated that children learn through observation in the absence of reinforcement, and provided experimental evidence for social learning theory. It also showed that children learn aggression from adult role models, particularly if the model was of the same sex as the child. This process of imitation occurred with a model unknown to the child, showing that aggression could be easily imitated from any aggressor.

Strengths and weaknesses of the study

One weakness of this experiment is that the children were tested in an unfamiliar environment and may have guessed the aims of the research. One child was said to have remarked to their mother: 'That was the adult we were supposed to copy.' This indicates that the children may have believed that they were expected to copy the aggressive role model rather than spontaneously imitate them. This is known as responding to **demand characteristics**.

A further weakness is that the researchers deliberately exposed small children to aggression and could not predict the long-term effects on behaviour for the child. They can therefore be accused of not protecting the participants involved, presenting ethical issues.

However, the researchers were able to control the environments and use a standardised procedure to ensure that all children experienced exactly the same conditions of the experiment. This means that the procedure was replicable and should have resulted in reliable findings, which are strengths of the study.

Another strength of the study was that the children were matched in groups according to their normal levels of aggression. This was to ensure that one group was not naturally more or less aggressive than another group. The researchers compared the ratings of the experimenter and the children's teacher and found a high level of agreement.

Sum it up

This classic research clearly shows that children imitate aggression in the absence of reinforcement. It has important implications for the types of role models that children are exposed to, particularly on television. The research has informed broadcasting regulations concerning age ratings and certification of programmes and films. It has also led to the advent of the watershed, an age-appropriate boundary of 9 p.m., before which violent films cannot be shown as children could be watching.

Apply it

Dmitri frequently dressed up as a superhero and ran around the house with a stick that he used as a sword. He pretended to use toys as a gun and was often in trouble for hitting or pretending to shoot his younger brother. Explain Dmitri's behaviour using Bandura, Ross and Ross's (1961) study.

Key term

Demand characteristics: when the behaviour of participants changes because they derive cues from the experimenter about the nature of the study and conform to those expectations.

Link it up

Find out more about demand characteristics, replicability and reliability in Topic 11 *Research methods*.

Charlton et al. (2000) Children's Playground Behaviour Across Five Years of Broadcast Television: A Naturalistic Study in a Remote Community

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

This research was conducted on the island of St Helena, a small British colony in the South Atlantic Ocean. The island did not have access to mainland television channels but there were plans to introduce it via satellite. Tony Charlton and other researchers were interested to see what influence television would have on the children of the island.

Aims

To investigate the effects of television on children's behaviour. The researchers were particularly interested to see whether television would cause the children to become more aggressive.

Procedure

The study was a natural experiment because the researchers did not directly manipulate the **independent variable** – the introduction of television. The **dependent variable** was the behaviour of the children before and after television was introduced. This was measured in terms of prosocial and antisocial acts that were displayed in the playground.

The researchers went to the island in 1994 and recorded the behaviour of children 4 months before satellite television was introduced. They set up video cameras in two primary schools to observe the playground behaviour of the children, aged between 3 and 8 years old, over a 2-week period. The researchers recorded 256 minutes of children's free play and used the Playground Behaviour Observation Schedule (PBOS) to code prosocial and antisocial acts (see Table 6.3).

Link it up

Find out more about natural experiments and variables in Topic 11 *Research methods*.

Key terms

Independent variable: what a researcher changes to see the effects of such a change.

Dependent variable: what a researcher measures to see what effects come from their changes to the independent variable.

Five years after television was introduced, the researchers returned to the island and filmed similar-aged children at the primary schools once more. Over a 2-week period, the researchers gathered 344 minutes of footage that they coded using the same PBOS. The researchers also noted whether the act was displayed by a single girl/boy, pairs of girls/boys, groups of more than three girls/boys or mixed groupings.

Antisocial acts	Prosocial acts
gesture, verbal	gesture, verbal
contact, kicking, pushing, hitting	sharing, turn-taking, helping
seizing, damaging property	consoling, affection
non-compliant holding, forcing	hand-holding, arm in arm

Table 6.3 Antisocial and prosocial acts recorded in the PBOS

The researchers analysed the recordings using the PBOS and made a tally of the acts displayed by the children in 60-second intervals. They then averaged the mean number of acts displayed by children in every 30-minute period.

Results

Of the 64 pre- and post-television comparisons made, only nine significant differences were found (see Table 6.4).

Overall, the researchers found five declines in prosocial behaviour of both boys and girls in single gender pairs/groups and mixed groups/pairs. They also found two increases in prosocial behaviour of boys playing alone, and two decreases in antisocial behaviour of boys and girls.

Interestingly, there was no change in antisocial behaviour observed in children's playgrounds, such as fighting, hitting, kicking and pushing, after television was introduced.

Further analysis revealed that boys had a tendency to display more antisocial acts than girls (around four times more), and girls were slightly more likely to show prosocial behaviour, although this was not significant. Both boys and girls displayed twice as much prosocial behaviour compared to antisocial behaviour, and this changed very little between the observations.

		Mean number of recorded acts (30 min)			
	Type of act	Pre-TV	Post-TV	Gender	Change
1	Prosocial acts	13.67	5.75	Girl pair	Decline
2	Prosocial acts	5.22	1.58	Girl group	Decline
3	Prosocial acts	2.44	0.58	Boy group	Decline
4	Prosocial acts	0.22	1.67	Boy	Increase
5	Prosocial acts	0.00	0.58	Boy	Increase
6	Antisocial acts	1.11	0.83	Girl	Decline
7	Prosocial acts	2.00	0.58	Mixed pair	Decline
8	Prosocial acts	1.89	0.58	Mixed group	Decline
9	Antisocial acts	0.78	0.00	Mixed pair	Decline

Table 6.4 Significant differences in pre- and post-television results

Conclusions

The researchers concluded that television had little influence on the behaviour of the children studied, and that the children were not copying the aggression that they had witnessed on television. The researchers pointed out that there might be environmental conditions specific to the island that could explain why the children did not imitate television aggression. In particular, the close-knit nature of the community and the high levels of adult surveillance over the children may have explained why television had little effect on the children's behaviour.

Strengths and weaknesses of the study

One strength of the study was that the same primary schools were used in both the before and after television observations. Although different children were observed, the fact that the same environments were studied minimised differences that could have occurred if different schools had been used.

A significant strength of the study was that it was a natural experiment, which means that it was conducted under naturally occurring circumstances, rather than a situation staged by researchers. It was also conducted in real school playgrounds and the children were unaware of being studied because they were young. This means that the behaviour of the children would have been natural and unaffected by the presence of strange observers.

However, the findings of the study may be limited to this particular community. Research carried out in different locations have not been able to replicate these findings. Tannis Williams (1981) conducted a similar study on three communities in Canada and found that television did increase aggression in children.

Other researchers have pointed out that the television programmes watched on the island were not the same as on mainland television, and could have contained less violence. For example, the popular children's television programme *Teenage Mutant Ninja Turtles*, which has a high level of violence, was not broadcast on the island.

Sum it up

This study is an insight into a unique community and importantly demonstrates that close-knit communities may buffer against the influence of violent television programmes. However, because it is a unique community, we cannot generalise the findings to most other communities where there is urbanisation and greater exposure to the effects of media on children's behaviour.

Exam-style question


Describe one way that Charlton et al.'s (2000) study on the introduction of television to the island of St Helena could be improved. **(2 marks)**

Exam tip

To improve a study, look at its weaknesses and consider how you would go about changing the procedure using the acronym **GRAVE**: **G**eneralisability, **R**eliability, **A**pplication of findings, **V**alidity, **E**thical issues.

Psychology in action

Understanding the influence of the media on prosocial and antisocial behaviour has never been more important than now. We live in a society where media and technology are central to our lives. The development of mobile devices means that we carry around access to media influences in our pockets, and improvements in digital imaging and cinematography make these media influences ever more realistic and consuming. More importantly, young children have access to many forms of media and games consoles. The impact of this rapid rise and development in technology has to be studied in order to understand whether it is having a positive or negative influence on the behaviour of children. Recent research has examined the impact of realistic simulations in video games, finding that the more blood we see in violent games, the more aggressive we become.

A close-up photograph of two babies. On the left, the back of a baby's head and ear are visible. On the right, a baby with light skin and blue eyes is looking towards the first baby with a wide, open-mouthed smile. The background is a soft, out-of-focus light color.

Topic 7 | The self – What makes you who you are?

Exploring the topic

This topic focuses on how our 'self' develops and what makes us who we are, including how we see ourselves. You might have a high opinion of your 'self' in one area of your life, such as in your school work, and a low opinion of your 'self' in terms of how good you are at sport.

Most of us experience low self-esteem at some point in our lives and people may then seek counselling. Low self-esteem can come from loss, for example, not being as good at something as you used to be. Knowing about such issues can help people overcome the fear and sadness linked with low self-esteem.

Your 'self' includes the temperament you are born with and your experiences with others, which you incorporate into your idea of your 'self'. We also seem to have personality types or traits.

There is a lot that makes you who you are. In this topic, you will also see that there are questions yet unanswered in this area of psychology.

Your learning

In this topic you will learn about:

- concepts of the self and self-concept
- the role of identity and free will in the development of self
- the humanistic explanation of the self
- internal and external influences on the self and self esteem
- how personality can be measured
- the use of trait theory as a measure of personality
- studies investigating 'the self' by Vohs and Schooler (2008) and Van Houtte and Jarvis (1995).

Getting started

To start off your investigation into 'what makes you who you are', make three lists about yourself. List your physical description, what you are good at and what you would like to improve about yourself.

How did you describe yourself physically? Have you used categories such as gender, hair and eye colour? You probably have not referred to your ankle size or the shape of your ears. This shows that our view of 'self' is, at least to some extent, guided by social and cultural customs.

Now find an online personality test to take. You are not doing this to find out about your own personality, but to see how personality is tested. Did you notice that some statements appear twice but in a different format? This is used to check that someone is answering in a cohesive (reliable) way. Also, did you find it hard to give some of the answers? This can be a problem with using a scale such as from 1 to 10. Did you agree with the personality you 'got'? It is important to note that there are no right or wrong personalities.



Taking a selfie might be about our identity but is probably more about communication and capturing the moment

The self – What makes you who you are?

Concepts of the self and self-concept

What you will learn

- Lewis's (1990) ideas about two parts to the self: existential and categorical.
- Rogers' (1959) ideas about the way our self is divided and the key terms he used.

Key terms

Self: our thoughts and emotions about who we are.

Self-concept: how we see ourselves, based on how others see us and our own beliefs.

Existential self: awareness that we have an existence that is separate from others.

Categorical self: awareness that we are seen by others by means of categories, such as age.

Link it up

Piaget's views of how babies develop schemas is discussed in Topic 1 *Development*.

Apply it

As a young adult, Lu saw herself as tall and of average size. However, as a grandmother in a society where average height and waist size had risen during her lifetime, she saw herself as a short person with a light frame.

Explain Lu's changing view of self using Lewis's ideas.

Our '**self**' is what we are that separates us from others: it is the 'thing' we think about as being 'us'. **Self-concept** refers to our view of our 'self' that we get from how others react to us and our beliefs about ourselves.

Existential and categorical self

Michael Lewis, an American psychologist, says the idea of self develops with age and is affected by our experiences in the world. Lewis (1990) separates the self into two parts: the **existential self** and the **categorical self**.

Existential self

The term 'existential' refers to our existence – we are aware that we have a self that is distinct from others. There is coherence in our idea of 'who we are' and we see our self as constant. This 'constant self' is, according to Lewis, our existential self (Figure 7.1). Lewis sees this self as starting at around 2 months old. It arises from our interactions with the world, giving us the idea of self as a separate being. For example, a baby touches a rattle and hears a sound, and so relates its own touching of the rattle to the sound made. Having control over their world helps babies to develop this schema or idea of a distinct self.

We are unique.

We are separate from others.

We have a core that gives us continuity.

Figure 7.1 Our existential self is our sense of being individual, separate and whole

Categorical self

The child realises that he or she can be categorised by others in specific ways, such as by gender or size. Lewis calls this idea the categorical self. The categorical self has categories such as an age, a gender, a height, different roles such as son or daughter, abilities, and so on. We see ourselves in the world by means of categories such as these. The categorical self changes as someone's values change and develops from around 18 months. Cultural changes can also change how someone sees themselves.

Evidence for Lewis's concepts of self

Lewis and Jeanne Brooks-Gunn (1979) used the red-nose test to study self. Babies are placed so that they are looking into a mirror. The babies are then shown their noses smudged with red make-up. If they reach up for their own nose, they show a sense of self; if they do not reach for their own nose, they have no sense of self. Lewis and Brooks-Gunn found that at about 18 months old, children reach for their own nose.

The self and mental health

Carl Rogers (1959), an American psychologist, split self-concept into three parts: **self-image** is how we see ourselves, **self-esteem** is how we value ourselves and the **ideal self** is what we think we 'should' be like (Figure 7.2).

Self-image	Self-esteem	Ideal self
<ul style="list-style-type: none"> How we see ourselves Might not reflect reality Comes from family, the media, friends etc. Can include social roles, e.g. I am a daughter Can include personal traits, e.g. I am a worrier Can be about physical characteristics, e.g. I am tall 	<ul style="list-style-type: none"> How far we value ourselves Includes evaluation ideas, for example: high self-esteem, including confidence in an ability; low self-esteem, including wanting to be like someone else 	<ul style="list-style-type: none"> What we would like to be Comes from society Someone gets an idea of what they 'should' be like or what they 'ought' to do If the ideal self matches the self-image then there is balance in someone's self-concept Issues of congruence and incongruence apply

Figure 7.2 The three parts of self; a poor match between self-image and the ideal self can lead to mental health difficulties

Congruence and incongruence

Our ideal self might not match our self-image. If what we think we should be, from cultural and social views, does not match how we see ourselves, then this gives a state of **incongruence**, which affects our mental health negatively. If our idea of our ideal self matches our self-image, our picture of ourselves matches what we feel we ought to be like, so we are in a state of **congruence**.

Self-actualisation

Self-actualisation refers to achieving one's potential. When the parts of the self match, and a person experiences congruence, there can be self-actualisation. When parts of the self do not match well, self-actualisation is difficult. According to Rogers, the goal of the individual is to self-actualise.

Key terms

Self-image: how we see ourselves.

Self-esteem: how we value ourselves.

Ideal self: how we would like to be.

Incongruence: ideal self and self-image are often different and self-actualisation is difficult.

Congruence: ideal self and self-image are mostly similar and self-actualisation is possible.

Self-actualisation: what we can become; achieving one's potential in life.

Link it up

Self-actualisation is discussed in a later section, *The humanistic explanation of the self*. Read ahead to find out more.

Develop it

Carl Rogers was a psychotherapist. Find out more about person-centred or client-centred therapy. If someone's ideal self and self-image do not fit, what can be done to help?

Exam tip

When two theories are covered in your course, draw up a table with comparison points so you are ready for exam questions like this one. For example:

	Lewis's (1990) view of self	Rogers' (1959) view of self
Self is split into parts	existential and categorical	self-image, self-esteem, ideal self

Exam-style question

Lewis's and Rogers' theories about the self both rely on the effects of others.

Explain the influence of others on the self for both theories.

(4 marks)

The self – What makes you who you are?

The role of identity and free will in the development of the self

Link it up

Some of Freud's ideas are discussed in Topic 9 *Sleep and dreaming*.

What you will learn

- Erikson's (1959) theory of the eight stages of identity development.
- Baumeister's (2008) views about free will and the consequence of a belief in free will.
- The strengths and weaknesses of both.

Develop it

The phrase 'identity crisis' comes from Erikson. Research identity crisis, including role confusion in adolescence. Note how Erikson's approach was positive – if development goes 'wrong', we can go back and 'put it right'.

Key terms

Psychodynamic: Freud's theory about psychological forces that drive human behaviour and emotions and their interaction with early experiences.

Identity: who or what someone or something is.

Eight stages of identity development

Erik Erikson built on Sigmund Freud's **psychodynamic** idea that we develop through stages. Erikson (1959) focused on mental and social development and looked at our whole lifespan, from birth to old age, and how we build our **identity** through 'crises'.

We develop through eight challenges or opportunities, each of which occurs at a particular age. His theory, known as the 'eight stages of man', is 'biopsychosocial': **biology** (we go through stages as we age), **psychology** (it is about mental development) and **social** factors (how our interactions with others help to shape us).

Development through a sequence

According to Erikson, psychological problems can arise if we do not develop through 'normal' stages (Table 7.1). Erikson recognised the importance of other people in development. For example, a strong identity comes from other people recognising a child's achievements. In each stage, there can be confusion if the challenge of that stage is not achieved. Each crisis has two opposite alternatives, for example, trust or mistrust. The individual needs to resolve each crisis to successfully complete a stage.

Strengths and weaknesses of Erikson's theory

A strength of Erikson's theory is that it can be applied to people throughout their life (a lifespan theory). Freud's theory looked at development up to

Stage 1 (0–18 months)	Stage 2 (1.5–3 years)	Stage 3 (3–5 years)	Stage 4 (5–12 years)	Stage 5 (12–18 years)	Stage 6 (18–40 years)	Stage 7 (40–65 years)	Stage 8 (65+ years)
Trust or Mistrust	Autonomy or Shame and doubt	Initiative or Guilt	Industry or Inferiority	Identity or Identity confusion	Intimacy or Isolation	Generativity or Stagnation	Integrity or Despair
Gets care and security from caregivers or does not.	Has self-certainty or is self-conscious.	Role experimentation or fixation on a role.	Learning about effort or stuck regarding effort.	Finding out about identity.	Understands own sexuality or has confusion.	Gives back to the next generation or does not.	Sees self as successful with a philosophy for life or is dissatisfied.

Table 7.1 Erikson's 'eight stages of man' and identity issues at each stage

adulthood, and then supposed that early experiences predicted later development. Erikson can account for development throughout our lives.

Erikson's ideas have practical applications. For example, Goodcase and Love (2016) suggest using Erikson's ideas about integrity and despair with therapists working with those over 65, showing that older people are still developing and can benefit from examining their own beliefs.

One weakness of Erikson's theory is that cultures have wide differences in the age a developmental stage might occur. For example, marriage in one culture can happen at the age of 13. In another, it can be 30. Therefore, intimacy or isolation can be experienced differently between cultures, and Erikson's theory may not be as universal as first thought.

Erikson's theory has also been criticised (Gilligan, 1982) for using gender stereotyping, such as intimacy or isolation being about women more than men.

The consequence of belief in free will

Roy Baumeister (2008) looks at **free will**, which is about self-control and making rational choices.

There are different views about free will:

- If things happen because of our biology, influences from growing up or other outside forces, it is hard to say that people act in a completely free way. As such, they should not be held responsible for their actions. This is **deterministic**.
- Jean Paul Sartre, according to Baumeister, claimed that there is always a choice about any action, and so people are always responsible for their actions and always free.
- Immanuel Kant, according to Baumeister, felt that freedom was about morality and sound reasoning, but that only some actions are decided on in this way. Free will is about self-control and reasoned choices.

Baumeister argued that psychology must investigate free will, which impacts on our social and moral judgements. Free will can be studied scientifically by looking at how we control our behaviour and make rational choices. According to Baumeister, self-control and making choices is biologically 'expensive' – it can deplete our resources by using up a lot of glucose in the brain. For example, it was found that after blood glucose depletion, drinking lemonade with sugar improved people's self-control on tasks.

A belief in free will has many consequences.

- **A belief in free will leads to our justice system.** If nobody is responsible for their behaviour, then punishment will not prevent a repeat of that behaviour. In 'heat of passion' crimes, according to Baumeister, a judge might give a reduced sentence because free will was affected by biology. This underlines how the justice system does believe in free will (and that it can be affected by biology).

Key terms

Free will: the ability to choose exactly what type of behaviour we want to show; the opposite of being 'determined'.

Deterministic: our actions come from what we are born with and what we experience; this is the opposite of having 'free will' or free choice.

The self – What makes you who you are?

Link it up

Prosocial behaviour is discussed in Topic 5 *Social Influence*.

- **A belief in free will improves prosocial behaviour in someone.** Belief in free will can help with self-control. People who feel empowered and in control of their actions and emotions are more likely to acknowledge responsibility for themselves. This can make someone more likely to help others in society (prosocial behaviour).
- **A belief in free will improves someone's control over their emotions and impulses.** It takes energy to make choices and use rational decision-making. Being less impulsive can help to manage that energy.
- **A belief in free will helps someone to learn from the challenges they encounter.** Someone who believes they have free will is more likely to reflect on any guilt or problems associated with negative events. This can help them to avoid similar events in the future.

Strengths and weaknesses of Baumeister's (2008) views

Baumeister's views focus on our everyday understanding of what it means to act from free will, rather than on philosophical discussions. People understand free will as thinking about what they are doing and making decisions based on their own judgements and ideas. This is a more useful approach than suggesting, philosophically, that none of our actions are free.

Baumeister and Munroe (2014) suggested that once social psychology can measure free will in terms of making choices and decisions, 'scientific' experiments can be carried out to advance understanding of free will and decision making. Vohs and Schooler (2008) is one such experiment.

However, there are weaknesses to Baumeister's views on free will. When free will is tested using experiments, it becomes specific decision-making rather than a wider description of why we act. Reducing free will to specific measurable behaviours (reductionism) can be said to not take the 'whole' of a person's decision-making into account (holism), missing important aspects of human intention.

There are other explanations for what we might see as free will. Actions may be randomly displayed rather than coming from free will. Ebert and Wegner (2011) carried out an experiment to see if randomness could be mistaken for free will and found that it could.

Link it up

Reductionism and holism is an issue and debate in Topic 2 *Memory*.

Link it up

Vohs and Schooler's study is discussed later in this topic.

Apply it

Simon did not want to rob the old woman but the man was holding an iron bar menacingly and motioning for Simon to rob her. Simon even said 'sorry' as he grabbed the old woman's bag and threw it at the man, who immediately ran off with it. The police were not sure whether to believe Simon's story. The old woman pointed Simon out as the thief, so he was arrested.

Use ideas about the consequences of a belief in free will to explain issues around Simon's arrest.

The humanistic explanation of the self

What you will learn

- Humanistic explanations of the development of self-esteem – Rogers' (1951) theory.
- Humanistic explanations of the development of personality – Maslow's (1943) hierarchy of needs
- Strengths and weaknesses of Rogers' (1951) and Maslow's (1943) humanistic explanations.

The humanistic approach

In the **humanistic approach** to looking at humans, the individual's own experiences and interpretation about what is going on around them are seen as important. It sees people as having free will and being able to change. It sees people as inherently good with an inbuilt need to make things better, making this an optimistic approach. In the humanistic approach, self-actualisation is seen as the goal for each individual (Figure 7.3).

Rogers' humanistic theory: the development of self and self-esteem

Carl Rogers (1951) took a humanistic view in his explanation of self-esteem and the self. He thought that humans are good by nature and that all individuals naturally aim for personal growth in order to reach fulfilment or self-actualisation. To become the best we can be, we must have a positive sense of self-concept and be in a state of congruence, which enables self-actualisation. Rogers also thought that childhood is an important time in our development and that self-esteem reflects our idea of self-worth, which comes from other people's judgements.

Unconditional and conditional positive regard

Rogers aimed to help individuals raise their **self-worth** and self-esteem, to achieve a state of congruence and move towards self-actualisation.

- **Unconditional positive regard** from others is necessary for this to happen. This means valuing someone for who they are with no 'conditions' attached. Unconditional positive regard is the way to improve someone's self-esteem and self-image. People can make mistakes and still be valued.
- **Conditional positive regard** is being valued but only according to certain conditions, which lowers someone's overall self-esteem. For example, some parents might love a child only if they behave well.

Congruence and incongruence

Rogers felt that someone cannot work towards self-actualisation if they are in a state of incongruence because their self-image and ideal self do not match. A counsellor would work with someone to help change their self-image to something more realistic, and to improve their self-image if their self-esteem is low. One way to achieve congruence is to tackle their **conditions of worth**.

Self-actualisation

- Trusting oneself
- Being socially effective
- Dealing well with change
- Being open to experiences
- Living in the here and now
- Being aware of surroundings

Figure 7.3 The humanistic view is positive about people, focusing on them reaching their full potential, which is self-actualisation

Key terms

Humanistic approach: an approach that studies the whole person. It looks at an individual's own experiences and interpretations about what is going on around them.

Self-worth: evaluation of own worth, giving judgement of self-esteem.

Unconditional positive regard: accepting and supporting someone no matter what they say or do.

Conditional positive regard: there are conditions for someone to be accepted or loved.

Conditions of worth: conditions people feel they must meet to be worthy of being loved.

The self – What makes you who you are?

Conditions of worth

Someone may have learned that to be worthy, they must fulfil certain conditions placed on them by others. In someone's early experience, for example, they may have been praised only when showing intelligence so now they have to see themselves as intelligent to feel worthwhile. People can feel like they are 'never good enough', which would lead to a state of incongruence and not being able to achieve self-actualisation. To achieve congruence, they need to have their 'worth' shown to them so that they believe in it. 'Should haves' and 'ought tos' can be taken apart so that their view of their ideal self is more achievable.

Apply it

Bruno, diagnosed with depression, had an appointment with a person-centred counsellor. He explained to the counsellor that his father had only praised him when he got good grades, which he mainly did not, and Bruno had felt unloved as a boy. Bruno's father thought boys should not cry and Bruno should 'be a man'. Bruno's boss criticised him a lot, making him feel anxious. Consequently, Bruno's work was affected.

Describe, using Rogers' ideas about the self, how the counsellor is likely to explain Bruno's depression.

Strengths and weaknesses of Rogers' personality theory

A strength of Rogers' personality theory is that it is positive and focuses on the individual, and so can be used to help someone to move towards better mental health. If an individual's mental health is improved this can save on a society's health costs and build a stronger work force.

There is a practical application of Rogers' ideas. Counsellors using different approaches, such as using cognitive behavioural therapy (CBT), still focus on giving unconditional positive regard and using empathy. It has a wide application in therapy.

However, Rogers' concepts are hard to measure, making studies less scientific and evidence harder to gather. Unconditional positive regard can appeal to us but we can only speculate about its effect, though Rogers did gather a lot of case notes to support his ideas.

Another weakness is that it only suits certain situations, such as low self-esteem, and does not suit all medical conditions. For example, Eysen et al. (2013) found client-centred therapy did not help those with multiple sclerosis compared with occupational therapy.

Hierarchy of needs

Abraham Maslow's (1943) explanation of personality includes biological aspects of people and sees them as whole individuals, making this a humanistic theory.

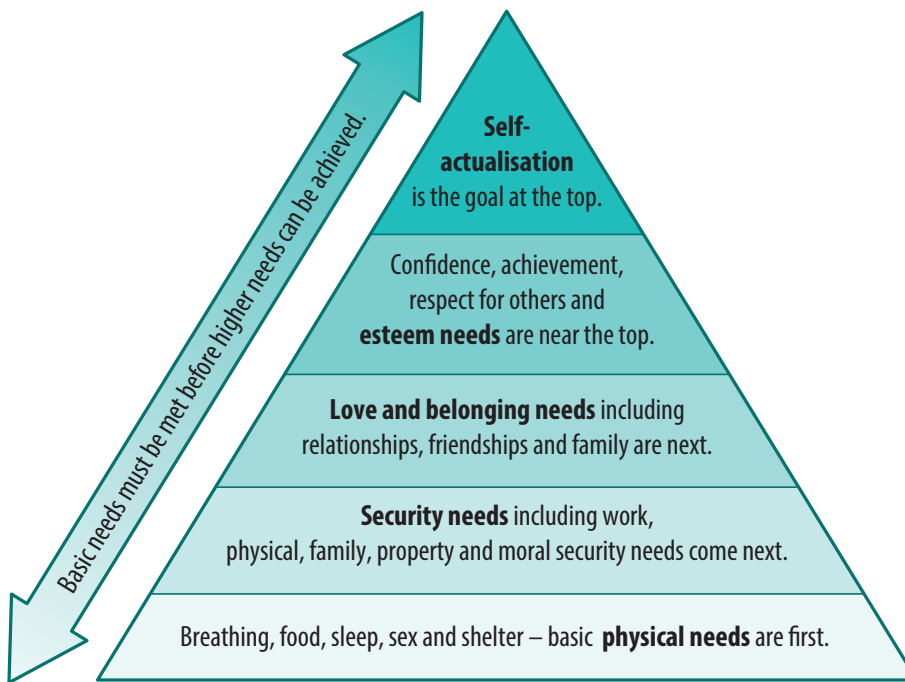


Figure 7.4 Maslow's hierarchy of needs shows that people's physical and safety needs must be met before they can get near to fulfilling their potential

Maslow's point is that underlying needs generally have to be met before the next need can be achieved. He called the first four needs 'deficiency' needs – if they are not met, the person will be anxious and tense. Needs can be focused on at any time so the individual might look for a relationship and also aim to achieve other needs. Saying this, there are some needs that dominate, such as physical needs.

Develop it

Find out more about Maslow's hierarchy of needs and how it is used in different fields, for example in business.

Strengths and weaknesses of Maslow's humanistic theory

Maslow's humanistic theory is positive psychology – that people are basically good and can reach their full potential. As such, it helps a society to build a positive culture and helps with health and business needs. It can help managers to understand workers' needs for friendship and security.

In underlining that people's basic needs must be fulfilled before they can achieve their potential it helps people to achieve their potential, which is a worthy aim in itself.

A weakness of this theory is that Maslow's ideas tend to focus on Western culture. For example, the needs of the USA in peacetime in the 1900s were not the same as those found in the Middle East over the same period. This limits the explanatory power of the humanistic approach and of Maslow's explanation of personality.

As with Rogers' ideas, Maslow's theory states that concepts are not measurable in a general sense. They vary between individuals and needs are subjective, so the theory cannot be tested scientifically to show universality.

A further weakness of the humanistic approach is its claim that humans are basically good, which needs evidence. For example, van IJzendoorn et al. (2010) found 7-year-old children did not show moral behaviour because of inborn temperament, but it was situation that led to their donating to charity or not.

Link it up

For a discussion on holism, see Topic 2 *Memory*.

The self – What makes you who you are?

Internal and external influences on the self and self-esteem

Key terms

Internal factors: about the individual, such as their character.

External factors: about what is outside of the individual; a situation.

Temperament: the nature someone is born with, which affects their behaviour.

Introvert: someone tending to be shy and not likely to seek social interaction.

Effortful control: using reasoned effort to control actions and thoughts.

What you will learn

- The influence of temperament, an internal influence, on the self and self-esteem.
- The influence of experience, an external influence, on the self and self-esteem.

Our self and self-esteem can be influenced by **internal factors**, which are features of us as individuals, and by **external factors**, which come from outside us – such as a situation or experience.

Internal influence on the self and self-esteem: temperament

Temperament is a biological aspect of a person. It is different for each individual and relates to emotions and controlling oneself. Temperament can affect self-concept. For example, someone with low self-esteem who has a shy temperament might become more of an **introvert** and so more likely to fall into depression.

Kati Heinonen et al. (2002) found that children judged by their mothers to have difficult temperaments at 12 years old reported that they had low self-esteem at the age of 18, giving some evidence of a link between our innate (inborn) temperament and our later self-esteem. Types of temperament that seem to relate to self-esteem include **effortful control**, a tendency toward negative emotions and persistence (maintaining effort).

Effortful control

Effortful control is an aspect of temperament referring to self-regulation. Effortful control means making decisions about what to attend to and what to prioritise. An example might be paying attention in class when there are distractions. A child who can self-regulate does better in their life because they interact well with others, so higher self-esteem might go with a temperament that includes self-regulation. Richard Robins et al. (2010) showed that young adolescents who had high self-esteem also had high levels of effortful control. They also found a relationship between low self-esteem and both depression and aggression; this was the case for both boys and girls.

Negative emotions

Robins et al. (2010) found that another aspect of temperament is a tendency to have negative feelings. Someone with negative feelings is more likely to suffer from anxiety, giving them low self-esteem.

Persistence

Persistence (how task-oriented someone is) is another aspect of temperament. There is some evidence from Windle et al. (1986) that persistence goes hand-in-hand with high self-esteem. The same can be said for not being distracted, which is another temperament trait.

Link it up

Self-regulation and its link with interacting with others is discussed in Topic 1 *Development*.

Exam-style question

Describe **two** ways in which temperament is an internal influence on the self and self-esteem. **(4 marks)**

Exam tip

Use the 'What you will learn' points at the start of each section in this book to check that you have notes on everything you need to cover. You can then generate your own exam-style questions to help your revision and exam preparation.

External influence on the self and self esteem: experience

Our external experiences influence our sense of self and self-esteem. These experiences include the influence of parents and how others see us.

Self-efficacy

Self-efficacy is how strongly we believe we can succeed in a certain situation or achieve a task. We can have high self-efficacy related to one type of goal and low self-efficacy regarding another, and this can depend on the reactions of others to us. Self-efficacy comes from our experiences and interactions with the world. We decide our level of self-efficacy depending on the situation we are in, which underlines the external aspect and the role of experience.

Factors affecting self-image

Michael Argyle (2008) suggested that an important influence on self-esteem comes from the reactions of others. A positive self-image comes from praise and attention, and a negative self-image comes from criticism. We also compare ourselves with others. If we compare ourselves with others who have done better than us, our self-image would be negative. On the other hand, our self-image is positive if those we compare with have not done as well as us. Experiences in the world give us an understanding of what is acceptable in our society, including how we see the different social roles. It can improve our self-image if we see ourselves as having a worthwhile social role, but the opposite can also be the case.

The perceptions of others

How others perceive us can change, which affects our self-esteem. For example, if someone unexpectedly does well in a maths test at school and is then seen as 'good at maths', this affects their self-image in a positive way. Negative examples can also occur. Rina Bajaj (2008) discussed the effects of the London bombings of 2005 on young Asian men in London. She found that the young men had the same internal beliefs as before, but the way others perceived them had changed. This seemed to affect their identity and their sense of self. It is well documented that bullying in school can have a serious negative effect on someone's self-esteem.

Try it

Find some willing participants around your own age and informally interview them. Ask them to talk about what they are good at and what makes them good at it, and what they are not so good at and why they think that is the case. Analyse your findings. See if you can find examples of internal influences, such as temperament, and external influences, including experience, on their self-concept. Remember to tell them afterwards what the interviews were about.



We can feel 'on top of the world' when praised by others for an achievement, giving us high self-efficacy. Does this mean we feel good at everything we do?

Key term

Self-efficacy: the strength of our belief that we can achieve a certain task.

Apply it

Sam, a presenter of natural history programmes, is very good at biology but did not do well in his maths A level. He is also an accomplished guitar player, well-known to many. It is assumed he would have high self-esteem. Explain how his experiences may have influenced his self-concept.

The self – What makes you who you are?

Key terms

Scales: classifying information using numbers that represent certain characteristics.

Items: statements or questions on a questionnaire, including those on a personality test.

Dimensions: things that can be measured, such as ‘openness’ in personality.

Conscientiousness: being organised, efficient and careful through wanting to do things well.

Neuroticism: tendency towards feeling depressed and having emotions such as anger and anxiety more than is average.

Likert-type scale: a scale where a person can rate their level of agreement to a statement.

How personality can be measured

What you will learn

- How personality can be measured using personality scales.
- How personality can be measured by personality types.

Personality is about someone’s way of behaving, feeling and thinking, and relates to their view of their ‘self’. Personality is measured so that differences between us with regard to our personality can be studied.

Personality scales

It is hard to compare descriptions of personality, but we can compare scores (quantitative data). Measuring personality often includes **scales** that give characteristics, such as ‘meanness’, a number (score). Scales can measure someone’s personality using a particular trait. An example might be producing a score along a line from ‘shy’ to ‘outgoing’. Scores from scales can be totalled to summarise personality and to give an overall score for a characteristic that has two extremes, like introversion–extraversion. Scales offer an objective way of measuring personality as those running the test do not interpret the results, reducing bias.

Personality tests involve questions or statements, called ‘**items**’, which are answered using a standard scoring system that predict a personality based on responses. Scales can include **dimensions**, which people judge themselves against. For example, ‘On a scale from happy to sad, where ‘happy’ is 10 and ‘sad’ is 1, what score would you give yourself?’

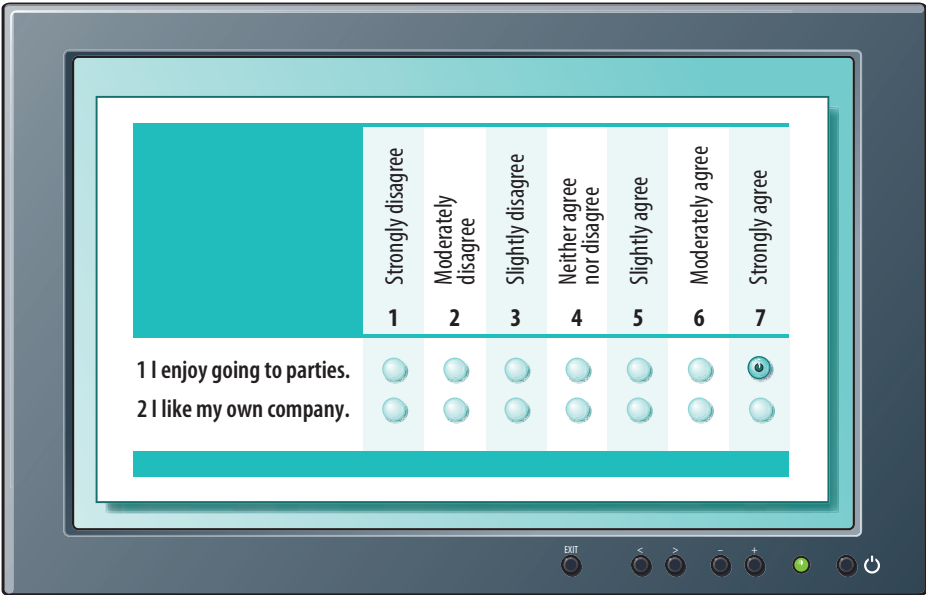
Items on a personality test often focus on what are called the ‘Big Five’ dimensions: openness, **conscientiousness**, extraversion, agreeableness and **neuroticism**.

Participants can be given a **Likert-type scale** (Figure 7.5).

Develop it

To find out more about measuring personality traits using a Likert-type scale, look at the Ten Item Personality Inventory (TIPI) online.

Figure 7.5 A 7-point Likert-type scale. These items are measuring degree of extraversion and use reversing. A very extraverted person would select ‘Strongly agree’ (score of 7) for item 1. For item 2, the extravert would select ‘Strongly disagree’ (score of 1).



Apply it

Amav wants to see if conscientiousness goes with agreeableness. He writes two questionnaires: one to measure conscientiousness, the other to measure agreeableness. Both use Likert-type scales. He uses statements like 'I like people' for agreeableness and 'I like things to be in order' for conscientiousness. Amav also reverses some items. He reverses 'I often forget tasks' and 'I ignore other people's problems'.

Explain what is meant by 'reversing' in this context, and why Amav does this.

Response bias

Someone carrying out a personality test (or any questionnaire) might get used to answering in the same way throughout the test. For example, once they reply 'agree', they might keep on selecting 'agree' to save them thinking or because they are unsure. To avoid this sort of **response bias**, some items in a personality test are reversed (see Figure 7.5).

Personality types

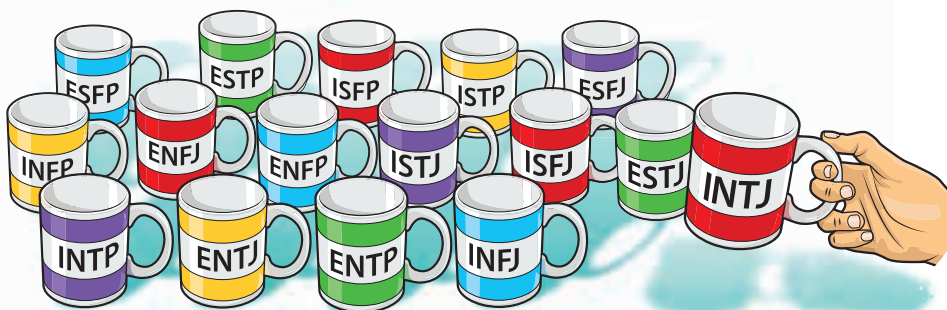
A theory of personality can be a **type theory** or a **trait theory**.

- Type theory sees someone's personality as fitting into a category (or type), such as introvert or **extravert**. Type theory is about giving someone a named characteristic.
- Trait theory is about personality having characteristics on a **continuum**, such as on a scale of extraversion. Trait theory looks at quality differences between people.

Personality types are limited to just some 'types', whereas traits cover wider aspects of behaviour.

Myers-Briggs Type Indicator

Isabel Myers and Katharine Briggs (1956) based their test of personality type on Carl Jung's idea that we experience the world in different ways. Jung suggested eight personality types made up from combinations of extraversion or introversion, and sensing, intuition, thinking and feeling. Myers and Briggs added judging and perceiving to this list. They turned these types into four overall ways that people experience the world: extravert (E) or introvert (I), sensing (S) or intuition (N), thinking (T) or feeling (F), and judging (J) or perceiving (P). Myers and Briggs wanted to enable people to discover their own way of dealing with the world. This was to help couples recognise their differences and work on them to smooth their path through life.



Link it up

The use of scales, and reversing when scoring scales, is discussed in more detail in the *Studies* section. Quantitative data, bias and objectivity are discussed in Topic 11 *Research methods*.

Link it up

Trait theory is discussed in the next section. Read ahead to find out more.

Key terms

Response bias: some way of answering questions or items in a misleading or set way.

Type theory: a theory suggesting a person's personality can fit into a category or type, such as introvert or extravert.

Trait theory: a theory suggesting that personalities have characteristics that are on a continuum.

Extravert: outgoing, confident and good at mixing in social situations; the opposite of introvert.

Continuum: two characteristics that are opposite extremes with a line between them on which someone can 'fit'; for example, somewhere between introversion and extraversion.

Develop it

Look up The Myers & Briggs Foundation to find out more. Although the tests are expensive and not easily accessed, you can find out about how they are used.

Figure 7.6 The Myers-Briggs Type Indicator, using self-assessment on a series of questions, has four dimensions to measure personality

The self – What makes you who you are?



An older woman can be helped by someone sitting down to talk with her for a while. Refugees can be helped by providing tents and support and by people spending time with them. Helping behaviour can be a central trait in someone, or a secondary trait if it is only done in a certain situation. Which picture shows helping as a cardinal trait and which as a central or secondary trait?

Key terms

Factor analysis: using statistical analysis to find overarching (larger) patterns.

Cardinal traits: rare traits that govern us strongly. They tend to dominate our lives.

Central traits: traits that are more common and less strong, such as friendliness.

Secondary traits: traits that we have but don't always show, such as anger.

The use of trait theory as a measure of personality

What you will learn

- Allport's (1936) theory of cardinal, central and secondary personality traits.
- Cattell's (1946) 16PF personality assessment.
- The strengths and weaknesses of trait theory as a measure of personality.

As already discussed, trait theory is about the measurement of personality traits, which can cover a broad spectrum of behavioural characteristics. When personality traits were first studied, a great many were found, but these have since been reduced to identify the overarching traits. For example, introvert can mean being shy and quiet. If we consider introversion as a trait rather than a type, the traits shy and quiet become covered by an overall trait: 'introvert'. Some ideas about traits, such as how there is a continuum in personality, underline the difference between traits and types. One example could be a continuum from quiet to loud – people can fall anywhere on this line. Types are more set – someone would be 'the quiet type' or 'a loud person'.

Factor analysis

Researchers use **factor analysis** to form underlying characteristics that predict behaviour from the outward characteristics that people show. For example, if someone enjoys parties, is interested in people and seeks out activities where there is danger, factor analysis will show that these outward characteristics often go together in people. Together, these outward characteristics are given a label – 'extraversion', for example. Finding that the opposite of this (someone preferring their own company and not looking for risk in activities) also goes together, leads to the extraversion–introversion dimension. Factor analysis is a statistical technique.

Cardinal, central and secondary personality traits

Traits are ways of putting someone's behaviour into a group or pattern. Gordon Allport (1936) came up with the first trait theory. He classified traits into three levels, which he called cardinal, central and secondary traits. He identified many traits (around 4,000) that characterise each personality, choosing observable features (such as 'shy') and those likely to be permanent in someone.

- **Cardinal traits** are rare traits that govern us very strongly, tending to dominate someone's life. For example, extreme altruism – helping someone at great risk to oneself, or living in a different country and take on a complete 'helping lifestyle'.
- **Central traits** are less strong and more common. They include loyalty and friendliness.
- **Secondary traits** are those we do not always show but still have, such as being angry when we are made late for something.

16PF personality factor assessment

Raymond Cattell (1946) aimed to reduce Allport's list of around 4,000 traits to something that would be easier to use to measure personality. Some of Allport's words were very similar to others, while some were rather uncommon. These were removed, leaving 171 traits. Cattell still wanted to measure personality in a more useful way. Instead of a list of 171 traits, he suggested someone's personality could be summarised more usefully by showing how far they displayed certain traits.

To measure personality he looked at:

- life data that covered someone's everyday behaviours
- data from experiments to assess people's reactions to standardised situations
- data from questionnaires to get people's **self-ratings** about their behaviour and feelings.

Cattell then used factor analysis on his data to see which traits went together so that he could reduce the list of 171 even further. By doing this, Cattell found 16 dimensions (Table 7.2). The 16 dimensions on the **16PF** measure personality using continuums. For example, if you score low on the dimension of warmth, you are categorised as 'cold'.

Strengths and weaknesses of trait theory as a measure of personality

A strength of trait theory is that Allport chose traits that were observable. Other trait theories, such as Cattell's, then evolved from Allport's traits. This means someone's traits can be measured, such as how they rate themselves on a friendly versus unfriendly dimension. People's scores can be compared and their personality labelled. Another strength is the use of

self-rating scales so that there is no interpretation from someone else, adding validity to the findings. Someone's personality is measured using their own criteria so there is an element of the data being 'real'. Both these strengths relate to the methods used to gather data for the theories.

Another strength is that different theorists have come up with similar traits even when working independently. This gives strength to the claims that these traits are what form someone's personality.

However, there are weaknesses to trait theory as a measure of personality. Starting from traits and summarising someone's personality is useful, but it is hard to predict someone's behaviour from their traits as they might behave differently in different situations. We can say to someone that a person is likely to be agreeable, for example, but that might not happen on every occasion.

Another weakness with trait theory is that people have to be self-aware in order to give self-ratings that represent their characteristics. We might think of ourselves as agreeable, but others might not see us in that way. Also, while trait theory tends to describe our personality and our characteristics, it does not explain *why* we have those characteristics. This is a weakness as it limits the theory. It does not help to explain personality development or help to address changes someone might want to make given their traits.

Key terms

Self-rating: our own ideas about our traits, rated by us on a personality scale, for example.

16PF: a personality test based on people's own judgement of themselves on 16 factors.

Emotional stability	Vigilance	Openness to change	Dominance
Privateness	Warmth	Intelligence	Perfectionism
Sensitivity	Tension	Apprehension	Abstractedness
Social boldness	Rule consciousness	Liveliness	Self-reliance

Table 7.2 Cattell's 16 personality factors

The self – What makes you who you are?

Studies

Vohs and Schooler (2008) The Value of Believing in Free Will: Encouraging a Belief in Determinism Increases Cheating

What you will learn

- Background to the study.
- The main aims, procedure, results and conclusion.
- The strengths and weaknesses of the study.

Background to the study

Kathleen Vohs and Jonathan Schooler (2008) looked at moral behaviour. We might think that behaviour is controlled by our genetic make-up, our brain structure or environmental influences, and might feel we are not free to choose our own actions. If people feel they do not choose what they do, they might not feel responsible for their actions, which could encourage a lack of morality.

If people think behaviour comes from their inherited characteristics or their experiences, they might feel they do not control their actions. Determinism is the idea that all behaviour is 'determined' or caused by forces such as genes or environment. Free will is the idea that despite the influence of genes and experiences, people can make choices. Vohs and Schooler suggest that taking away someone's feeling of being in control and increasing their belief that behaviour is determined, and so reducing their responsibility, is likely to lead to less moral behaviour.

Link it up

Morality and morals are discussed in Topic 1 *Development*. Free will and determinism are discussed earlier in this topic.

Aims

To see if encouraging a belief in determinism would encourage cheating. Vohs and Schooler wanted to see if someone in control of their actions, but believing all behaviour is determined, would use that control to be

less moral rather than having 'normal' self-control and behaving morally.

Procedure

In total, 13 female and 17 male university students took part in the study. They were tested individually after having been randomly allocated to either the experimental or the control group.

The experimental group read about Francis Crick's claim, in 1994, that we have no free will and what we do comes from the way our brain works ('anti-free will'). The control group read about consciousness but not about the issue of free will. The **independent variable** was which passage was read. All participants were then put in a position that would allow them to cheat by using a computer program to give answers to maths problems they were supposed to be solving themselves.

Develop it

To look further at the issue of determinism (and free will), find out about *The Astonishing Hypothesis*, Francis Crick's book explaining how our behaviour comes from our biology.

A measure of the participants' beliefs about free will and determinism was recorded before and after the study. To do this, they were given a questionnaire called the Free Will and Determinism Scale (FWD) to complete.

To measure cheating, the number of space bar presses on a computer (a space bar press avoided the answer being revealed, so avoided cheating) was recorded. This was the **dependent variable**.

Key terms

Independent variable: what a researcher changes to see the effects of such a change.

Dependent variable: what a researcher measures to see the effects of their changes to the independent variable.

Link it up

Variables are discussed in Topic 11 *Research methods*.

Results

Participants who read Crick's 'anti-free-will' passage showed lower belief in free will than those in the control condition. This showed that Crick's passage led some participants to believe more strongly in determinism.

Space bar presses for each participant were recorded. However, presses showed a *lack* of cheating and Vohs and Schooler wanted their results to show cheating. They therefore subtracted the number of space bar presses for each person from 20 to give a 'cheating score' (measuring how many times they had not pressed the space bar, so had seen the answer and cheated). Participants showed more cheating if they read the 'anti-free-will' passage than if they did not (Table 7.3).

	'Anti-free-will' passage	Control condition
Mean measure of cheating	14.0	9.67

Table 7.3 The measure of cheating according to the two conditions (high score was set to mean more cheating; the score is the mean average)

Relationship between free will and determinism score and cheating behaviour

There was more cheating the less someone believed in free will. This was a **negative correlation**: the higher the cheating score, the lower the free will and determinism score. The result of the negative correlation was $r = -0.53$, where -1 would mean more cheating always went with belief in determinism and 0 means no correlation at all (-0.53 is quite a high, negative correlation).

Exam-style question

- Give the difference between the mean 'cheating' scores of participants who read the passage about determinism and those who did not. **(1 mark)**
- Explain this difference according to Vohs and Schooler's study. **(3 marks)**

Conclusions

When determinism is put forward as a view and free-will beliefs are challenged, behaviour becomes less moral (measured by cheating). It was found that weakening someone's belief in free will leads to a higher likelihood of cheating. It was also found that people's belief in free will is easily challenged. The results were compatible with those of Fred Schab (1991), who found that self-reports of cheating have increased over time, with 34 per cent of students in 1969 saying they used a cheat-sheet and 68 per cent saying this in 1989. Schab also found that more people said they felt that control over their actions came from external factors, which supports the idea that cheating is linked to deterministic beliefs.

Try it

Write a short questionnaire that gives some statements about 'determinism'. Ask some people to complete the questionnaire and then do a word-search task with the answers on the reverse of the questionnaire, asking them not to look at the answers. At the end of the task, ask if they used the answers and explain what the idea of the study is.

Did your participants feel they 'cheated' or did not cheat because of the statements about behaviour being determined? You could gather some interesting qualitative data to go with Vohs and Schooler's quantitative data.

Key term

Negative correlation: a negative relationship; the more a score rises on one variable, the more it falls on another.

Link it up

Correlations are discussed in Topic 11 *Research methods*.

Maths tip

If asked for a difference between scores, expect to give a number and, if in doubt, give two decimal places. You should include the unit of measurement being used, if there is one. Here, the unit of measurement is the mean measure of cheating.

The self – What makes you who you are?

Strengths and weaknesses of the study

There were ethical strengths in that participants in the 'cheating' condition could shred their results to protect their anonymity and when some participants were identifiable their results were removed. There was also a debrief, which complies with ethical principles.

A further strength is the practical application of the idea that behaviour comes from both genes and the environment. The findings suggest that believing we have free will can lead us to behave morally, even if from a scientific point of view our behaviour is all determined. This has an implication for society.

However, there are several weaknesses. There were problems with the measures of cheating. When the experiment was first carried out, it was thought that not pressing the space bar meant not cheating, but it could have simply meant just doing nothing. Another experiment was done to control this, as the researchers recognised this as a weakness. This second part of Vohs and Schooler (2008) can be found on the accompanying website. Another possible weakness is the moral behaviour that was measured – the behaviour was mildly unethical. It is possible that pushing someone into believing they do not have free will would not affect 'real' immoral behaviour. A problem with experiments like this is that they are artificial, both in their setting and in the task being completed, so they lack validity. These are all weaknesses of the methodology.

Apply it

Agata was studying philosophy at school, learning about what causes human behaviour. One reference said that our behaviour is determined by causes outside our control. Agata used to enjoy obeying rules. However, following her studies she stopped being so obedient and began breaking rules, such as pushing in rather than queuing up for the bus.

Using Vohs and Schooler's (2008) study, explain how Agata's studies might have been responsible for her less conscientious behaviour.

Sum it up

Vohs and Schooler (2008) showed that believing in free will is worth encouraging because it is more likely to lead to moral behaviour, which is important for society. They focused on a belief in determinism and how, if people do not believe they have free will regarding their actions, they might behave less morally than those who believe in their own free will. This is an important conclusion as it can help to explain not only cheating but also other immoral behaviour. However, there were validity problems in saying 'cheating' on a small task was the same as showing lack of morality. Even though Vohs and Schooler did another experiment to overcome the first criticism, the lack of validity still applies.

Van Houtte and Jarvis (1995) The Role of Pets in Preadolescent Psychosocial Development

What you will learn

- Background to the study.
- The main aims, procedure, results and conclusion.
- The strengths and weaknesses of the study.

Background to the study

Studies have shown that children see their pets as warm and empathetic, possibly because pets show unconditional positive regard for owners (they do not ask for anything in return). It would therefore seem that having a pet is advantageous.

When children are aged between 9 and 12, they form an identity and develop a sense of **autonomy**. These changes can affect their self-esteem and self-image. Beth Van Houtte and Patricia Jarvis (1995) focused on young adolescents, looking at pet ownership and children's well-being.

Link it up

Look back at Carl Rogers' work to remind yourself about some of the concepts mentioned here.

Van Houtte and Jarvis (1995) felt there was a need for a study controlling variables to see if pet ownership *causes* an improvement in wellbeing, as evidence had tended to come from questionnaires without controls. They chose to do a study using a control group of non-pet-owning children against which they compared the findings of the pet-owning children.

Aims

To find out how pets affect children's development. Specifically, to find out how having pets, or not having pets, affected children's self-esteem, self-concept, sense of autonomy and attachment to animals.

Mean age	8.7 years	9.5 years	10.7 years	11.6 years
Sample size	26	36	34	34

Table 7.4 Participants in Van Houtte and Jarvis's (1995) study

Procedure

In total, 130 children aged between 8 and 11 years old were used (Table 7.4). The children's school gave permission for the study. Participants had a brief explanation before the study started and were informed of their rights, such as their right to withdraw at any time.

Of the 130 children, 65 were pet owners and 65 were non-pet owners. Interviews were used to find out background information, such as whether parents were married or not, their family economic and social status, and how many brothers and sisters they had. The pet-owning children were then matched with non-pet-owning children based on this information.

- The independent variable was whether the child owned a pet or not.
- The dependent variables were autonomy, self-esteem, self-concept and attachment to animals, all measured by questionnaires.

Key term

Autonomy: being able to make one's own decisions; self-governing.

Exam-style question

Explain why participants were matched in the Van Houtte and Jarvis (1995) study. **(2 marks)**

Exam tip

In the exam, you may be asked about the methods used in one of the studies. When revising a study, it is helpful to draw up a table to show aspects of the methodology. For example:

Aspect	Explanation
Main research methods	Interviews and questionnaires
Experimental features	Experimental and control group

Link it up

Ethics and variables are discussed in Topic 11 *Research methods*.

The self – What makes you who you are?

Four measures were taken, matching the four dependent variables.

- **Measure of autonomy** – 20 questionnaire items, using Likert-type scales, asked about perception of parents as people, how much parents are idealised, how much parents are depended upon and how much the child sees themselves as a distinct individual.
- **Measure of self-concept** – the Self-Concept Scale for Children (Lipsitt, 1958) was used. It includes 22 descriptions that find out children's views of themselves, such as 'I am happy'.
- **Measure of self-esteem** – a standard self-esteem scale was used, asking how much the child agrees with statements such as 'I am satisfied with myself'.
- **Measure of attachment to animals** – a questionnaire was given to pet-owning participants with statements such as 'I consider my pet to be a friend'. Non-pet owners were given a different questionnaire to suit them.

Develop it

Look up the Self-Concept Scale for Children (Lipsitt, 1958) to find out more about it.

Results

Mean scores for pet owners and non-pet owners in the different age groups are shown in Table 7.5.

		Self-concept	Self-esteem
8.7 years	Pet owner	89.5	19.6
	Non-pet owner	89.1	20.6
9.5 years	Pet owner	83.8	19.0
	Non-pet owner	89.4	17.5
10.7 years	Pet owner	87.4	16.7
	Non-pet owner	90.4	20.0
11.6 years	Pet owner	94.2	17.2
	Non-pet owner	83.2	20.8

Table 7.5 Mean scores between pet and non-pet owners by age of children. For self-concept, a lower mean indicates *lower* self-concept; for self-esteem, a lower mean indicates *higher* self-esteem.

- **Self-concept** – 11-year-old pet owners had higher self-concept than non-pet owners of the same age (a mean of 94.2 compared with 83.2).
- **Self-esteem** – 9-year-old pet owners had lower self-esteem (19.0) than 11-year-old pet owners (17.2); 10- and 11-year-old pet owners had noticeably higher self-esteem than non-pet owners.
- **Attachment to animals** – the results for pet owners and non-pet owners were very similar so attachment to animals was taken as not relating to owning a pet.
- **Autonomy** – pet owners were more likely than non-pet owners to see their parents as people and pet owners could see their parents in roles other than the parental role – both suggest autonomy.

Conclusions

There was some support for the idea that pet owners showed higher autonomy, though this was only focusing on the aspect of how parents were perceived, not on all measures of autonomy. For 11 year olds, owning a pet was found to go with higher self-concept and self-esteem. Attachment to pets does not seem to relate to whether a pet is owned or not. The older age group of pet owners had higher self-esteem and so it was thought that just before the move into adolescence pet ownership had the most positive impact on development.

Strengths and weaknesses of the study

A strength is that the results can be applied to real life. Pets can be used as support when there is stress, especially for 11 year olds with low self-esteem. This is an example of psychology in action. Evidence from other studies supports Van Houtte and Jarvis. Judith Seigel (1990), for example, showed that pet support for the elderly helped to reduce stress.

A further strength is the control over possible extraneous variables (those that might affect the findings). These included number of siblings, parental marital status and social class, which helped to show that these variables did not contribute to the scores.

A possible weakness is that the measure of 'pet owner' was for a cat or a dog. Children classified as non-pet owners might have in fact owned a different kind of pet. This study also used a specific age range of children in one school. The results might not apply to children in special education or children with an illness, so generalising the results beyond the population represented by the sample might not be possible.

Link it up

Extraneous variables and generalisability are discussed in Topic 11 *Research methods*.

Develop it

Search for evidence of pets improving people's self-esteem to learn more about this.

Sum it up

Van Houtte and Jarvis (1995) used questionnaires and interviewed a sample of children in one school to find a link between pet owning and self-esteem and self-concept. They controlled for some variables, such as marital status, family and economic social status, and number of siblings. This meant that as these variables were in both groups evenly, they would not cause differences in findings about self-concept and self-esteem. Validity was limited – children could give their own answers but not all pets were considered. Their findings were useful as pets can be used to help children at an age when their self-esteem and self-concept might be low. The usefulness and controls in the study seem to outweigh the methodological difficulties. However, more data in this area would be useful.

Psychology in action

Knowing more about the self helps individuals. For example, person-centred therapy is about helping someone to move to a state where they have a balanced view of their 'self'. This can help someone with depression or anxiety tackle their fear and sadness. This approach to counselling, developed by Rogers in the 1950s, is still used and valued today.

A focus on understanding and helping people helps society as it leads to a more stable workforce and reduced absenteeism. More than that, knowing about our 'self' helps us to know ourselves and to deal with issues in our lives, hopefully helping us to live a happier life. How far we feel responsible for our actions can affect how 'moral' our behaviour is; we need to see actions as our own choice if punishment is to work. Helping children and young people to raise their self-concept by suggesting that pet ownership has value for children as they move into adolescence is important. Erikson's focus on identity crises in young people can help too.



Topic 8 | Perception – How do you interpret the world around you?

Exploring the topic

Have you ever wondered how you ‘know’ that a chair is a chair? Or that the person you can see is your friend and not a stranger? Our world is full of interesting things for us to look at, but seeing them is only half of the story. Once we have seen something, we need to interpret what it is so that we can understand what we see.

When we ‘see’ an object, our eyes are taking in light waves that give the brain information about the size, shape and colour of the object. It is up to our brain to make sense of this information so that we know what it is we are looking at. It might seem fairly straightforward – you see a chair and you just know it’s a chair – but think about all the different styles of chair you have seen in your life. These styles are different and yet you still know that each specific example is a chair. Think about a stool, for example. Stools are very similar to tables but you are still able to figure out that it’s a stool – a different kind of ‘chair’.

Now you can see just how difficult your brain’s job really is. There are lots of ways you can make the wrong interpretation and perceive things in the wrong way. This topic is going to explore how the brain is able to perceive this visual information and how we make sense of the world around us.

Your learning

In this topic you will learn about:

- how we use information from one eye (monocular) and both eyes (binocular) to understand the world around us, including visual cues, visual illusions and visual constancies
- the Direct Theory of Perception by Gibson (1966) as an explanation of sensation and perception
- the Constructivist Theory of Perception by Gregory (1970) as an explanation of sensation and perception
- the effects of motivation, expectation, emotion and culture on perceptual set
- studies investigating perception by Haber and Levin (2001) and Carmichael, Hogan and Walter (1932).

Getting started

Look around you now. What objects can you see? A chair? A table? A window? Another person? Have you ever wondered how you know what those objects in front of you are? Or how you can tell the difference between two very similar objects? This amazing ability that we all have is known as perception – our ability to make sense of the world around us. Our senses take in information and pass this to our brain, and somewhere along the way we work out exactly what that information means about the things in front of us.

To test this out, try confusing your friends with a visual illusion. Show them a picture, like Figure 8.1 below, and see if they can explain how and why it is so difficult to understand what is going on in the picture.

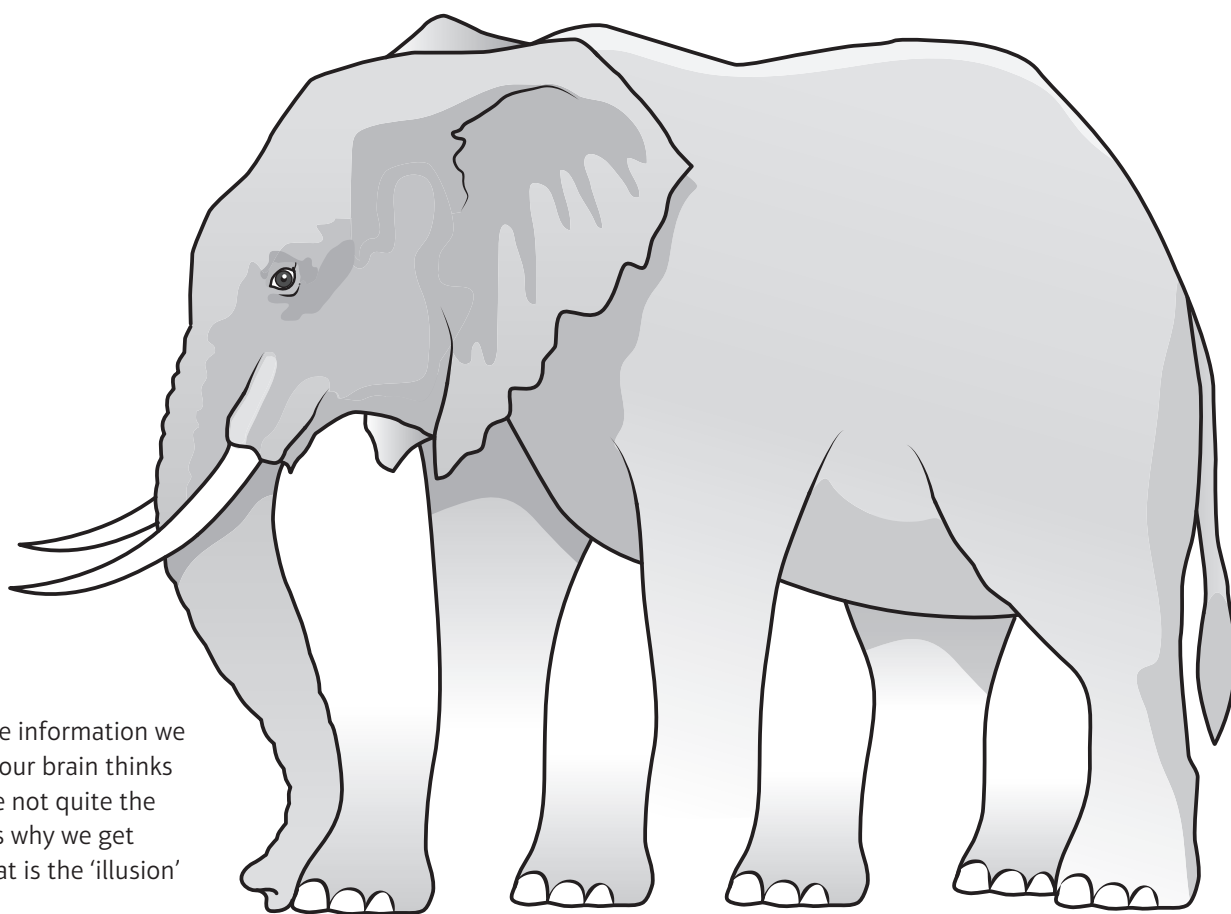


Figure 8.1 The information we see and what our brain thinks it is seeing are not quite the same, which is why we get confused. What is the 'illusion' in this image?

Perception – How do you interpret the world around you?

Monocular and binocular depth cues

What you will learn

- Examples of monocular and binocular depth cues.
- Reasons for monocular and binocular depth cues.

Key terms

Sensation: the information that enters our brain from our sense organs (in this topic, the visual information our eyes see).

Perception: the way our brain makes sense of the information from our senses (in this topic, how our brain understands what our eyes see).

Depth perception: the ability to judge how far away objects are from us.

Cue: information that gives a hint or clue about an item, object or situation.

Monocular: using one eye.

Binocular: using both eyes.

When we look at the world around us we take in lots of information through our eyes, including the size, shape, colour and texture of objects in our visual field. This information enters through both eyes and then travels to the brain through our optic nerve. This visual information represents our **sensation** of the world. The visual information is then processed and recorded by the brain. The brain helps us to make sense of the world around us and to understand what we are seeing. This is our **perception** of the world.

Visual depth cues

Our perceptual system helps us to judge the depth and distance of objects away from us. We possess **depth perception**, the ability to see the world in 3D (three dimensions: width, height and depth), which helps us to navigate around it. For example, when crossing a road we need to be able to accurately judge how far away cars are from us to work out when it is safe to cross. Depth perception uses lots of different types of information (**cues**) from our eyes. Some cues only need one working eye (**monocular**), while some need both eyes to be working (**binocular**). You need to know examples of different depth cues and the reasons for them.

Monocular depth cues

Monocular depth cues require only one eye to judge depth and distance with some accuracy.

- **Superimposition** – when an object is far away from us, items in front of it block out some of the distant object from our view. For example if you see a car parked on the street and a person walks past it, the person is closer to you than the car is if they block part of your view of the car while walking past.
- **Relative size** – objects look smaller the further away they are. So if you are looking at two objects that you know are similar sizes, but one of them looks smaller than the other, then you know that the smaller one is further away than the one that looks bigger.
- **Linear perspective** – parallel lines appear to get closer together the further away from you they get. When you look down a long, straight road or railway track, the two sides appear closer together as you look into the distance.
- **Texture gradient** – any texture on the surface of an object appears less defined the further away the object is. When you sit on the floor and look at the carpet next to you, you probably see lots of the fibres and patterns on the carpet. As you look further across the room you see less of the individual fibres and patterns, and more blocks of colour on the carpet instead.

Apply it

Tom and Tamsie are looking for somewhere to have a picnic but the grass where they are standing is patchy. They look up and see a lovely green area of grass towards the back of the field they are standing in. When they get there, though, the grass there is as patchy as it was where they had been standing before.

Using visual cues, explain Tom and Tamsie's mistake.

- Height in the plane – objects in the distance appear to be higher up in the visual plane than objects closer to us. So if you look out to sea when you are standing on the beach, the water in the distance looks as if it has risen up above the water close to the beach.

Binocular depth cues

Binocular depth cues require two eyes to be able to judge depth and distance accurately. Someone with one working eye would find it impossible to use this depth cue and may find judging depth quite challenging. Generally, depth perception is much more accurate when using both eyes.

- Stereopsis – because you have two eyes, one on each side of your face, each eye sends a slightly different image of what is in front of your face to your brain. This is called stereopsis. When the brain receives these two different images, it compares them and uses the difference between them to work out how far away different objects are from us. The bigger the difference between the images seen by the two eyes, the closer the object is to us.

Develop it

Look around you and use the internet to find other examples of these monocular depth cues.

Exam-style question

Figure 8.2 shows examples of depth cues.

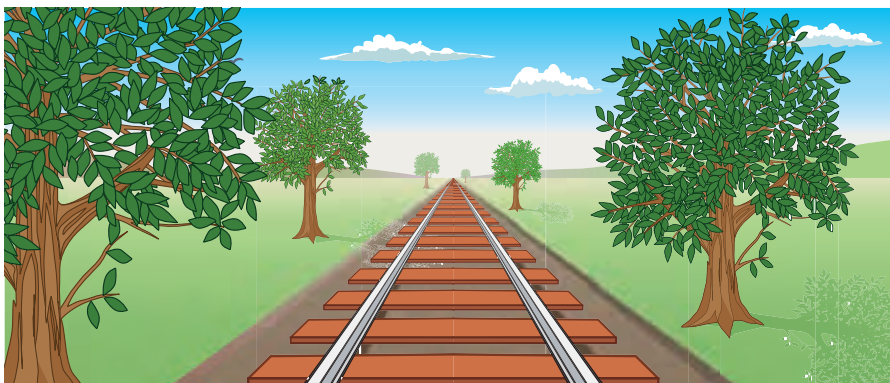


Figure 8.2

- Identify one example of a depth cue.
- Explain how this depth cue is shown.

(1 mark)

(1 mark)

Exam tip

Questions on visual depth cues may include a picture or a diagram that you will need to analyse in some way. Once you have identified the depth cue for part (a), state what the picture shows to make use of this depth cue for part (b).

Perception – How do you interpret the world around you?

Visual illusions

Sometimes the information that our eyes see is not that easy for our brain to understand. **Visual illusions** are pictures or objects that our brain struggles to perceive because they do not appear to 'make sense'.

- Fictions – visual illusions where we perceive an object that is not actually there. Our eyes send the information to our brain, and the brain thinks that it can see something, but it is not really there. For example, in a Kanizsa triangle illusion, it looks like there is a white triangle over the top of another triangle and three dark circles. In fact, there is no white triangle, it is just how we perceive the shapes seen by our eyes.

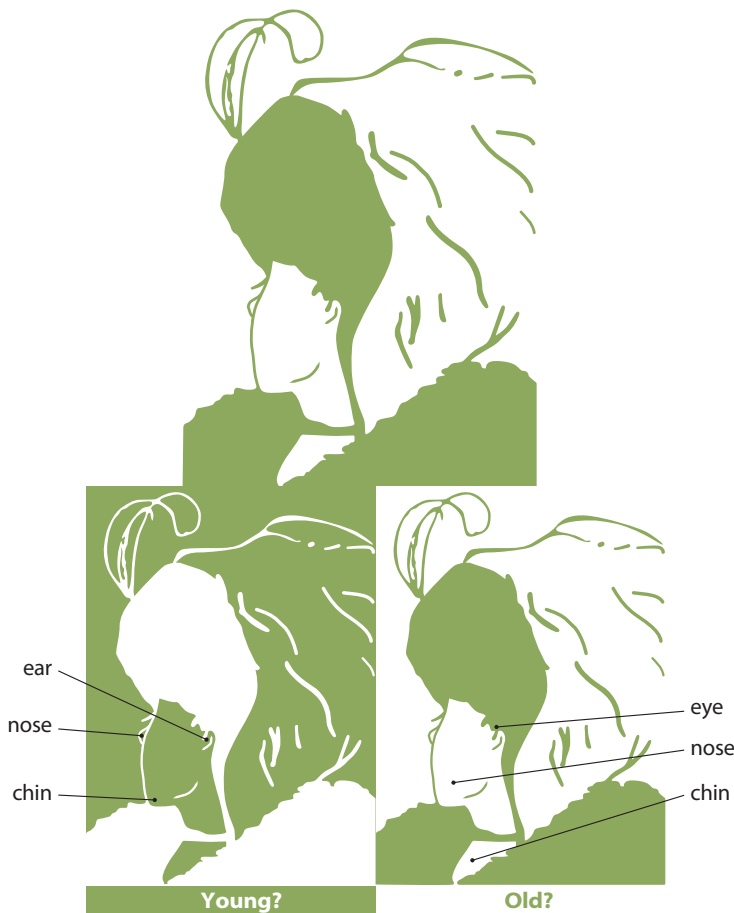


Figure 8.3 In the 'old woman/young woman' illusion (Leeper's lady), you can either see a young woman looking up and away or an old woman looking down and towards the left. Both of these images make sense, but they cannot be seen at the same time because each part of the picture means something different depending on whether you are looking at the old woman or the young woman.

- Ambiguous figures – visual illusions where an image can be perceived in more than one way, and all make sense. There are often two or more different images that can be seen depending on how you look at the picture (Figure 8.3).

Try it

We can try to influence which version of an ambiguous figure someone sees first by using **priming** – a way of getting people to think about something before they see it. Try talking to a friend about rabbits and then show them the illusion (Figure 8.4). Do they see the rabbit before the duck?

Try it again with a different person. Talk to them about ducks before showing them the illusion. Does this make them see the duck first?

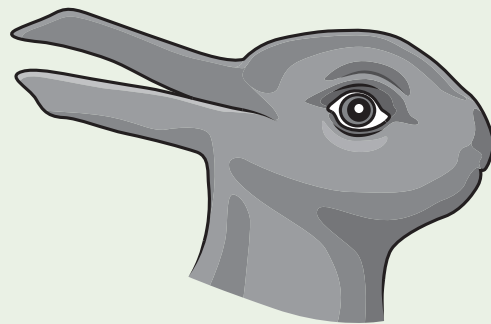


Figure 8.4 Ambiguous figure of rabbit/duck

- Distortions – visual illusions where the properties of an object appear to have changed or appear to be different from reality. This can include objects appearing to be different sizes when they are, in fact, the same size, or straight lines appearing to be curved. An example of a distortion illusion is the Müller-Lyer illusion – two horizontal lines of the same length have different 'arrow' shapes added to each end, making one appear shorter than the other.

Key terms

Visual illusions: a 'mistake' of perception, where what you think you are seeing is different to what you are actually seeing.

Priming: being exposed to a certain stimulus can influence the way you respond to a different stimulus later.

Visual constancies

Visual constancy is the ability of our perceptual system to hold a constant image of an object even when the actual image seen by our eye changes. Visual constancies include shape, colour and size of objects.

- Shape constancy – the ability to hold an object’s shape constant in your mind, even when the appearance of the image’s shape may change. When you look at a closed door, for example, it will appear to be a large, rectangular shape. If you gradually open the door, the varying angles of the door will make that rectangle look different. However, your brain will still perceive the door as a rectangle because the shape is held constant.
- Colour constancy – the ability of our perceptual system to hold a constant image of an object’s colour, even when the colour seen by our eye appears to alter. As light levels change, colours might seem to get darker, while in bright light some colours may seem faded. Our brain, however, can work this out and hold the colour as being the same (Figure 8.5).

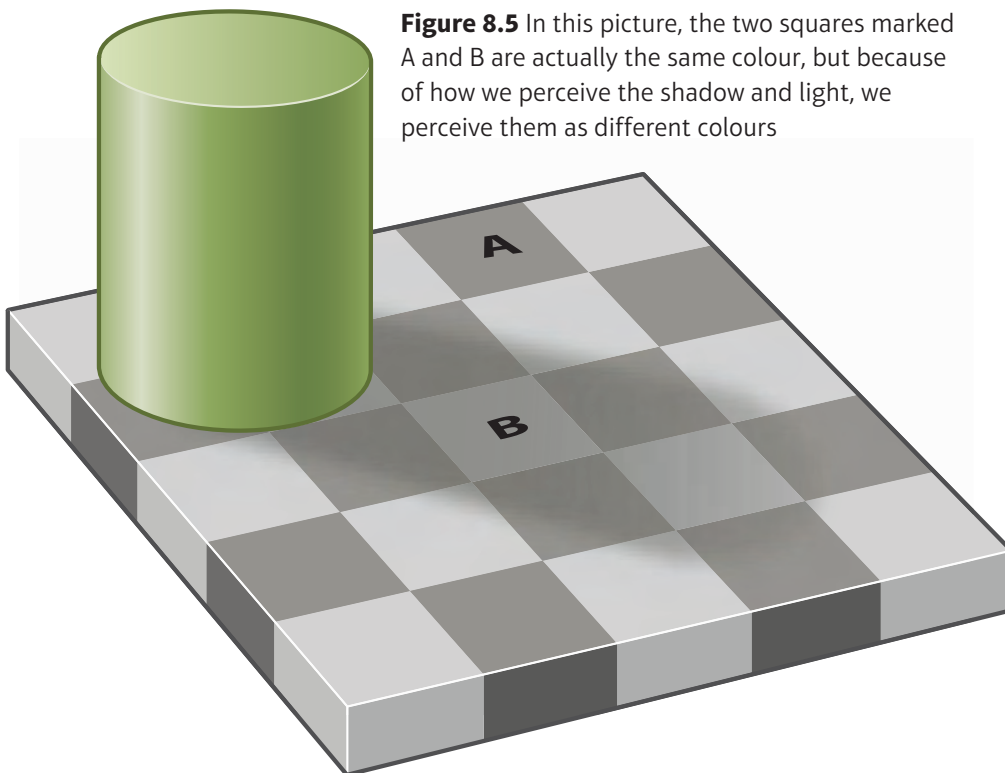


Figure 8.5 In this picture, the two squares marked A and B are actually the same colour, but because of how we perceive the shadow and light, we perceive them as different colours

- Size constancy – the ability of our brain to hold a constant image of an object’s size even when the object appears to be getting smaller. When objects get further away from us, the actual size they appear will seem to get smaller (see ‘relative size’, discussed earlier). However, we do not perceive the object to be shrinking because we hold an image of the object’s actual size. For example, if there were two people in a corridor – one close to you and another further away – the one furthest away would actually make a very small image in your eye. However, you would see them as a normal-sized person far away, rather than a tiny person.

Key term

Visual constancy: the ability to understand that the properties of an object stay the same even when the size, shape or colour of an object appears to change because of environmental conditions.

Develop it

Do some research and see if you can find examples of the visual illusions and constancies described here. Draw them for yourself and add them to your notes. Look for:

- a Kanizsa triangle
- the Müller-Lyer illusion
- examples of shape and size constancy.

Perception – How do you interpret the world around you?

Gibson (1966) The Direct Theory of Perception

What you will learn

- How the Direct Theory of Perception explains sensation and perception.
- The strengths and weaknesses of the theory.

James Gibson developed a theory of perception, referred to as the **Direct Theory of Perception** because of its emphasis on what we call **bottom-up processing**. Gibson said that we use our eyes to 'sense' the visual information in the world around us, and there is enough information in what we see to be able to make sense of what we are seeing. In other words, we sense all of the information about shape, size, colour and movement and send this to our brain. The brain can then put the information together to form an explanation that makes sense.

Sensory input

The first part of Gibson's theory is that information enters the eye from our environment. This information is the **sensory input** of visual information, which Gibson referred to as the **optic array**. Some of the visual information is static (or stays still), but some of it relates to the movement of light in front of us.

Optic flow

The patterns of moving light that we see when we, or objects, are moving around are known as **optic flow**

patterns. These patterns can tell us about the direction and the speed of movement. As you look into an optic flow, you can tell whether the flow is moving towards you or away from you by looking at a point in the distance in the direction of movement. For example, imagine you are travelling in a car and you look out of the front windscreen and focus on a point in the distance. If you are moving forward, towards the point you are looking at, then the optic flow will appear to come towards you from the point. However, if you look out of the rear windscreen as the car is moving forward, then the optic flow will appear to move into a point in the distance because you are moving away from that point (Figure 8.6).

Key terms

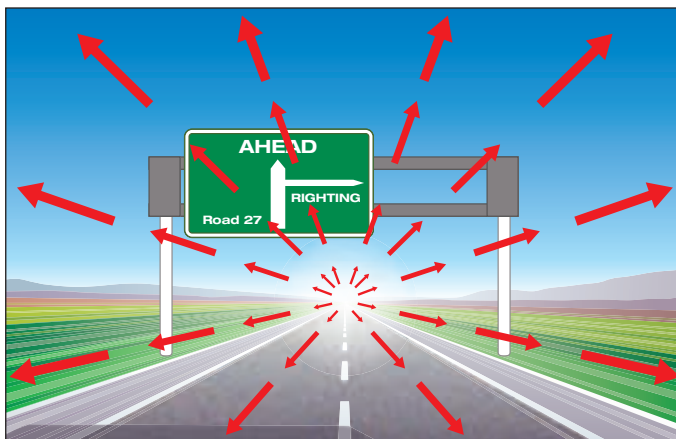
Direct Theory of Perception: an explanation that says we perceive the world around us by using the information taken directly from the world through our eyes.

Bottom-up processing: taking information in through our eyes and sending this to our brain to be processed; then the object in front of us can be perceived and understood.

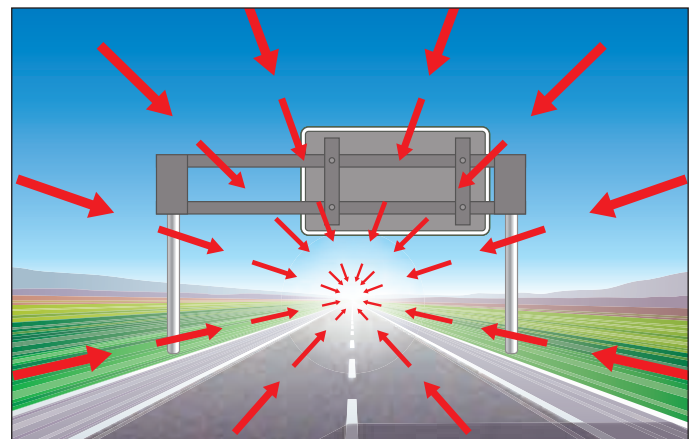
Sensory input: information that enters through the sense organs; in the case of perception, this is visual information entering through the eyes.

Optic array: the patterns of light that enter the eye to give a variety of visual information about the environment, such as colour, shape and size.

Optic flow: patterns of moving light in the optic array.



a) Optic flow as you are moving forward, toward an object



b) Optic flow as you are travelling backwards, away from an object

Figure 8.6 Optic flow patterns help us to understand the movements in our environment. Next time you are in a car, look out of the front and rear windscreens to see how the movement patterns differ.

Invariants

Invariants are examples of visual information that stay the same for us as we move around the environment. They help us to keep a constant picture of the objects around us even when the image entering our eyes changes. An example of an invariant is the ratio of the height of an object from its base to its top. When objects are in the distance, they look smaller to us than when they are close up, but the size they appear as will still be in the same ratio to their height.

Affordances

Affordances are visual clues that tell us information about what objects and items could and should be used for. We can use information such as the size, shape and angle of items in our environment to work out a sensible suggestion for what the item should be used for. For example, when looking at the structure of a chair, and the height of the seat in relation to where the back of the chair is, it looks as if it is an object that should be sat on. Therefore, it affords sitting.

Strengths and weaknesses of the theory

One strength of the theory is that it explains why we constantly fall for visual illusions even when we have seen them before. Because we perceive directly from the visual information in front of us, we would still see the illusion every time even when we know what to expect.

The theory has good application to real-life because it has been used to help train pilots. Runways have special markings on them to make it easier for the pilots to perceive the distance of the plane from the ground, and the speed that they are approaching the ground. By using these markings and being able to make perceptions accurately, pilots can ensure that their planes land safely.

There is research evidence that supports many of the claims of Gibson's theory. For example William Warren (1984) investigated affordances in stair climbing and found that people would judge a step to be unclimbable if the height was more than a quarter of their own leg length, regardless of how tall they were. This suggests that the affordances we apply to an object depend on how we perceive it in relation to our own body size.

A weakness of the theory is that the explanation is reductionist. Gibson felt that the ability to perceive was based on seeing information from the environment and did not take into account that previous experience might be important in perception. For example, Ralph Haber and Charles Levin (2001) found that when participants were asked to judge how far away different objects were from them, they were more accurate at judging the distance of the objects that were well known and had a fixed size. This suggests that they relied on using past information about the objects when they were perceiving the distance.

Link it up

For a discussion on reductionism, see Topic 2 *Memory*.

Some people have criticised Gibson's theory on the basis that it claims we only need to take in visual information (sensations) from the world and then we will understand what we are seeing. It is very difficult to ignore that previously stored information in the brain, and the brain itself, have any role in our perception of the world. For this reason, Gregory's (1970) theory (discussed next) may be a better explanation of how we see and perceive our world.

Try it

Our perception of affordances is influenced by how we perceive objects in relation to our own body, as stated by Warren (1984). Try this idea out yourself by selecting objects of different sizes that you can safely step up onto, such as a chair, table or textbook. Ask people to say whether or not they think they would be able to step up onto the object safely and record their answers, then take an accurate measurement of the length of their leg.

Can you replicate Warren's findings? If the step height is more than a quarter of the person's leg length, we might predict that they would think that the step is unclimbable.

Key terms

Invariants: visual information from the environment that stays the same.

Affordances: clues about what an object or item could be used for based on its visual appearance.

Perception – How do you interpret the world around you?

Key terms

Constructivist Theory of Perception:

a theory of perception that claims we perceive the world around us using information previously stored in our brain from past experiences.

Top-down processing: using information already stored in our brain to interpret sensory information that enters through our eyes.

Perceptual hypothesis/hypotheses: an estimate or guess of what is most likely to have been lost from the available visual information; this helps people to 'fill in the gaps' of what they can see so that it makes sense.

Inferences: conclusions drawn from the information that is available.

Gregory (1970) The Constructivist Theory of Perception

What you will learn

- How the Constructivist Theory of Perception explains sensation and perception.
- The strengths and weakness of the theory.

Richard Gregory developed the **Constructivist Theory of Perception**, so-called because it explains how our understanding of the world is built up through experience. The constructivist theory emphasises the use of **top-down processing** in our perception of the world around us. This theory claims that visual information enters through the eyes but the interpretation of this information relies on past experiences of similar visual information we have already stored in our brain.

Sensory input

Gregory believed that the majority of visual information that enters the eye is lost before it has had a chance to be sent to the brain to be processed. For example, if you look at the room in front of you, and then close your eyes, you will very quickly forget a lot of the visual information you saw. However, to make sense of the bits of information you can remember, your brain will start to 'fill in the gaps'.

Perceptual hypothesis

When the brain receives visual information with lots of 'gaps' in it – for example, you know there were some objects in the room, but you cannot remember what they all were – the brain starts to make **perceptual hypotheses**. These are the 'best guesses' that your brain can come up with to understand what the eyes are seeing. The brain fills in 'gaps' using past experiences of similar situations to estimate what is most likely to be in them. There are likely to be many possible right answers to what is missing in the 'gaps', so the brain will work through these possibilities until it finds the most likely conclusion. Sometimes these hypotheses will be wrong and this can mean that something can be perceived wrongly. This could account for why we sometimes experience visual illusions.

Inferences

The perceptual hypotheses that a person uses to make sense of the visual information that has been passed to the brain help the brain to infer, or make **inferences**, about what the eyes can see. The brain will decide which hypothesis makes the most sense based on past experiences of similar situations. Once this has been decided, the brain then makes an inference to conclude what the visual information tells it. This contrasts with Gibson's (1966) ideas of affordances. Gregory himself said that many modern objects, such as telephones, do not really **afford** their uses. But by looking at the features of an object we can **infer** what would be a sensible use for it.

Prior knowledge

The brain stores every piece of visual information we have seen and perceived in the past as an example of a past experience. This **prior knowledge** is then used to decide on the possible hypotheses that could be tested, helping us to make a suitable inference about what the visual information means. If we go into an office, for example, there are certain things we might expect to see, such as a printer, a desk and a stapler. So if we went into a room and saw these things, we might infer that it is an office because this hypothesis makes the most sense based on our prior knowledge gained from past experiences of offices.

Key term

Prior knowledge: information stored from past experiences of visual perception.

Link it up

Gregory is really talking about how prior knowledge is built from schemas. Find out more about schemas in Topic 1 *Development* and Topic 2 *Memory*.

Develop it

Do some additional research on Richard Gregory's work, including some of his famous experiments, by visiting his website.

Strengths and weaknesses of the theory

One strength of this explanation of perception is that it can help us to understand why we experience visual illusions. If a visual image could easily be perceived in more than one way, Gregory's theory would claim that there might be more than one hypothesis that would make sense from the visual information. The brain might therefore find itself switching between the two hypotheses, explaining why we can see the image in more than one way and why it still makes sense.

Another strength of this explanation is that there is research evidence to support the influence of prior knowledge on perception. Haber and Levin (2001), for example, found that participants were significantly better at estimating the size of objects when they were familiar with them and had prior knowledge about their actual size. When objects have a standard size with little variation between different examples of the same kind of object, such as a bowling ball or a beer bottle, the participants were able to use previous experience of these objects to perceive the visual information about their size.

Link it up

Size and distance perception are the focus of Haber and Levin's (2001) study, discussed in the *Studies* section. Read ahead to find out more.

Perception – How do you interpret the world around you?

One weakness of this explanation of perception is that it focuses too much on the role of prior knowledge and experience in our ability to understand the world around us. This does not explain why even young babies are able to perceive visual information with very little experience of the world. Goren, Sarty and Wu (1975) found, for example, that infants who were only 9 minutes old were more likely to visually 'follow' a moving image of a face than another object. This suggests that they had some kind of innate ability to perceive the difference between a face and other objects that could not have been learned from experience.

Another weakness is that most research evidence that supports the constructivist explanation has been conducted in controlled experiments, which may lack ecological validity. The perception of visual information in the real world might be more complicated than it is in an experiment. For example, there will be other sensory information alongside the visual information that might help with the perception of what a person can see. This means that visual perception in the real world happens differently to how it might in experimental conditions.

Link it up

Find out more about ecological validity in Topic 11 *Research methods*.

Apply it

Jade was enjoying studying Psychology, but she was struggling to fully understand Gregory's (1970) explanation of visual illusions. She was confused when looking at the Necker cube (Figure 8.7) because she could see two cubes and she saw each cube alternately.

Use Gregory's theory of perception to explain to Jade why she could keep seeing the two cubes.

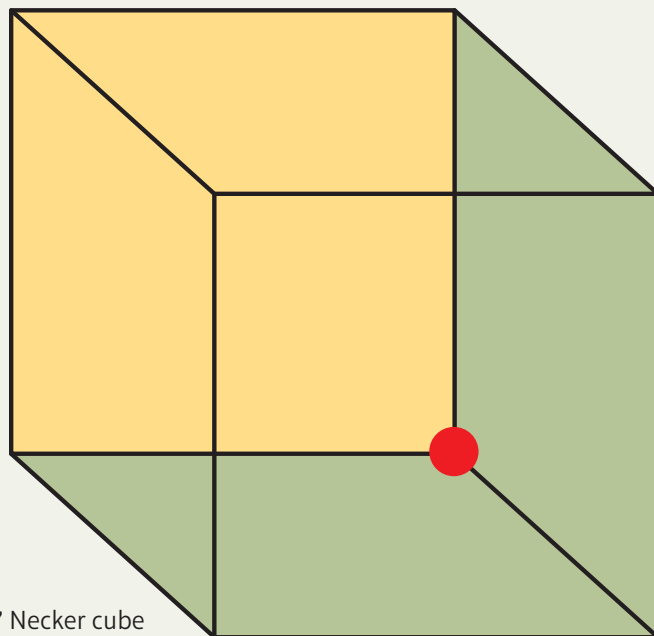


Figure 8.7 Necker cube

Perceptual set

What you will learn

- The meaning of perceptual set.
- How different factors influence perceptual set.

Perceptual set is a tendency to perceive some visual information in a particular way based on some other information we have available to us. When we are hungry, for example, we might notice adverts for food products much more quickly than if we are full. Perceptual set could explain how ambiguous figures might be perceived differently depending on how and where we see them (Figure 8.8).

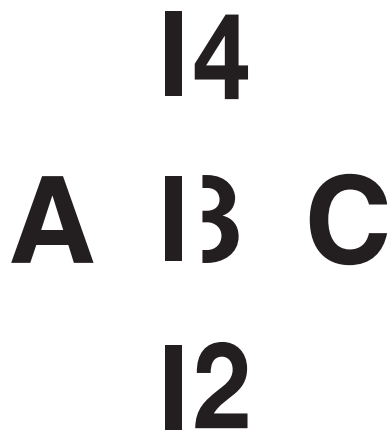


Figure 8.8 How does your perception of the centre figure change when you read horizontally or vertically?

When we see an item surrounded by other stimuli, such as in Figure 8.9, it can trigger a response from us based on a previous memory of what things usually 'go together'. This effect is known as priming and can influence our perceptual set.

Key term

Perceptual set: a tendency to interpret information in a particular way based on past experience or other information around us at the time.

Motivation

The way we perceive something will depend on the things we need or want (the motivation) at the time we encounter the object or situation. Charles Solley

and Gerard Haigh (1957), for example, found that if young children were asked to draw pictures of Santa Claus just before Christmas, they drew him bigger than children who were asked to do the same thing just after Christmas. This could be because they were looking forward to Christmas and, because they wanted it to come quickly, they perceived Santa as larger and drew him the same way.

Expectation

We will perceive something based on what we expect to be in the place where the item is perceived. Jerome Bruner and Leigh Minturn (1955), for example, used the figure '13' in Figure 8.9 and found that when participants saw the figure surrounded by numbers they perceived it as the number '13', but when they saw it surrounded by letters they perceived it as the letter 'B'. This shows how perception is influenced by what we expect to see in a given situation.

Exam-style question

A researcher decided to do a study into the effect of expectation on visual perception. They showed participants the visual illusion of the old woman/young woman (Figure 8.3) and asked them which they saw first – the old woman or the young woman.

Before they saw the picture, half of the participants were told a story about an old woman (Group 1) while the other half (Group 2) were told the same story but it was about a young woman.

Participants in Group 1 were more likely to report seeing the old woman first, while participants in Group 2 were more likely to see the young woman first.

Explain why the two groups perceived the picture differently, using your knowledge of expectation as a form of perceptual set. **(2 marks)**

Exam tip

Make sure you read questions like this thoroughly before you answer them. There is a lot of information in there but you do not need all of it to answer this question. You need to find and select the information that relates to expectation and how it affects perception.

Perception – How do you interpret the world around you?

Emotion

The mood we are in can affect how we perceive something. After watching a scary film, for example, you might be more likely to think you hear something in the house, or perceive a shadow as something frightening in the dark. Because you are already feeling afraid, you perceive other things as scary even if they are not. Wen-hua Liu et al. (2012) found that patients diagnosed with major depressive illness perceived negative facial expressions like sadness and anger much more quickly than positive facial expressions like happiness. This would suggest that feeling 'down' makes the patients more sensitive to faces showing negative emotions.

Culture

Your cultural background might influence how you perceive what you see. For example, people who live in environments that are very closely packed and dense, with very little open space, might not perceive depth cues in the same way as other people. Forest-dwelling tribes who are used to seeing objects surrounded by trees may have little experience of seeing objects in the distance. So, rather than seeing an object as far away, the reduced size of the far away object might be perceived as a very small object instead. William Hudson (1960) showed African Bantu participants images of animals being hunted by humans (Figure 8.9) and asked them questions, such as 'What is the man doing?'. Hudson found that both adult and child Bantu participants, who were not used to seeing pictures representing depth cues, tended to think that the man was trying to spear the elephant because it appeared to be closer to the spear in the 2-dimensional drawing. This would suggest that the cultural experience of exposure to 3-dimensional pictures depicting depth and distance (or a lack of such experience) might influence how supposed depth cues are interpreted.

Develop it

Many psychologists have suggested that the culture a person belongs to will influence the way they perceive visual information in front of them. One way that this can happen is in visual illusions. Some cultures do not seem to fall for visual illusions in the same way as others do. Do some research to find out how the experience of visual illusions differs depending on where you live.

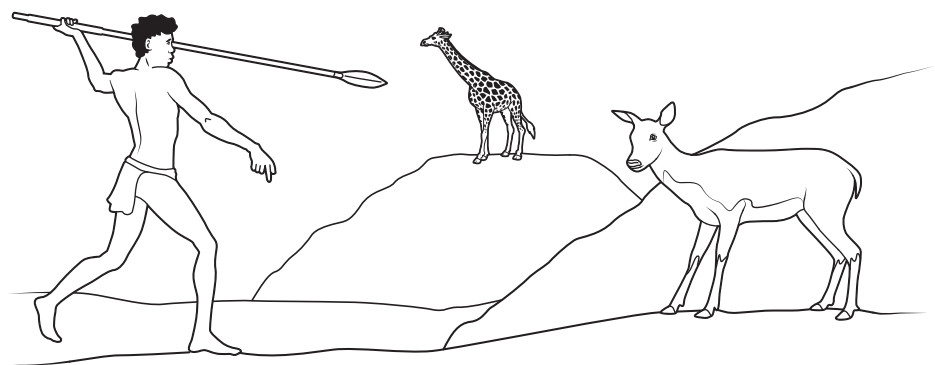


Figure 8.9 Why do you think the participants perceived the man to be hunting the giraffe rather than the antelope? What depth cues are being used in the picture?

Studies

Haber and Levin (2001) The Independence of Size Perception and Distance Perception

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Ralph Haber and Charles Levin report that early research on depth and distance perception seemed to assume that similar mental processes are involved in judging the size of an object and its distance. They argued that perceiving size and perceiving distance are two completely different processes that require different skills. They claim, for example, that when judging the size of an object we are familiar with, we make use of our memory of the previous times we have seen the object, rather than just making use of the visual information in front of us. To test out the idea that size and distance perception are two separate processes, Haber and Levin conducted two experiments (2001) to see whether participants use their memory of objects to perceive size or use the size of an object to help judge how far away it is.

Experiment 1

Aims

To see if objects could be separated into two categories: those that have very little variation in size between different examples of the same object (token invariant) and those that have a lot of variation between different examples of the same object (token variable).

To see whether participants were more able to accurately estimate the size of objects categorised as token invariant from memory compared to objects categorised as token variable.

Link it up

Earlier in this topic we looked at Gibson's (1966) ideas on invariants. Look back at this to remind yourself of the concept of an invariant.

Procedure

Haber and Levin began with a list of 50 items they thought would be very familiar to university students. They then looked for 10 different examples of each of these items that they could measure. This resulted in a list of 30 familiar items that they could find enough examples of to develop a list of measurements taken from different sources.

The participants – 109 male university students from Chicago, USA – were given a questionnaire to complete. It included the list of objects with space beside each one for participants to estimate how tall each object was in feet and inches (standard measures in the USA). The participants were asked to guess the size of all 50 of the original familiar objects, but the study focused mainly on the 30 that had been categorised as invariant or variable.

Results

Overall, 15 out of 30 of the objects in the list of familiar items showed a high degree of difference in measurements between the 10 samples they found – these were labelled as token variable items. Examples included Christmas trees, teddy bears and a television. The other 15 items on the list showed very little variation between the different samples – these were labelled as token invariant items. Examples included a basketball, a bowling ball and a beer bottle.

Perception – How do you interpret the world around you?

Key term

SD (standard deviation): a quantity showing the amount of variation of each score from the mean average.

Table 8.1 Measured heights and cognitive estimates of heights of some of the common objects

Object	Measured		Cognitive estimates	
	Height (feet)	SD	Height (feet)	SD
<i>Token invariant objects</i>				
Basketball	0.75	0.00	0.95	0.19
Beer bottle	0.63	0.04	0.63	0.16
Bowling ball	0.50	0.00	0.80	0.22
<i>Token variable objects</i>				
Christmas tree	5.58	1.18	6.82	1.25
Teddy bear	1.44	0.36	1.24	0.67
Television	2.02	0.69	2.18	0.73

Haber and Levin found that participants showed a good degree of accuracy in the size estimates they gave of all the familiar objects on the questionnaire. They also found that participants showed more variation in their estimates for the token variable than the token invariant items on the questionnaire. Most interestingly, they found that the participants were most accurate at estimating the size of objects that had little variation in size between different examples – those that were token invariant.

Conclusion

The results of the study seem to suggest that when people are familiar with objects that naturally vary very little in size from one example to another, they are able to accurately estimate the object's size even when they cannot see it. This suggests that our past experience of objects is important in judging the size of an object.

Experiment 2

Aims

Haber and Levin wanted to see whether this familiarity and size knowledge is used to judge distance. They wanted to see whether participants were able to judge the distance of familiar objects categorised as token invariant more accurately than familiar objects that were token variable or unfamiliar objects.

Procedure

Participants – nine male university students – were screened for normal vision before taking part. None of them had taken part in Experiment 1. The participants were taken to a large, open field with trees around three of its edges. The field was divided into four sections, three of which were in front of the position where the participants were made to stand, while the participants stood in the fourth section. Before the participants arrived, Haber and Levin had placed the 15 token invariant items from Experiment 1 in one section, at various distances from the participants' viewing location. They had placed the 15 token variable objects in another section at various distances, and 15 unfamiliar objects in the final section. The unfamiliar objects were coloured cardboard shapes in a variety of sizes.

When the participants arrived, they were driven onto the field in a van and kept their backs to the field until it was time for them to participate. All nine participants were tested at the same time, with three groups of three participants looking at each of the three sections at the same time and then rotating around. This makes the experiment a repeated measures design as each participant gave estimates for all three categories of objects. Each participant was given a clipboard and pen and a list of all 45 objects with space beside for two estimates of each object – the distance of the object from themselves, and the size of the object by recording the estimated height of each one.

Once the participants had finished their estimates, they were then taken back to the van and asked to fill out two questionnaires without looking at the field. One questionnaire asked them to rate on a scale of 1–10 how familiar they were with each of the objects (1 = not at all familiar, 10 = highly familiar). The other questionnaire asked the participants to estimate the size of each of the 30 familiar objects in the same way that Experiment 1 was carried out.

Results

Perception of size

Haber and Levin found that participants' estimations of the size of the objects were more accurate when they were categorised as token invariant. They also found that the accuracy of the size estimates in Experiment 2 was similar to Experiment 1, which suggests that size estimates are equally good whether they are done from memory or from seeing the objects. Participants in Experiment 2 even seemed to be quite good at estimating the size of the cardboard shapes, suggesting that their ability to estimate size for unfamiliar objects was also quite good.

Perception of distance

The results overall seem to show that participants were very accurate at judging how far away the three different categories of objects were when they were placed at a closer distance to the participants (0–50 metres). At this distance there was very little difference in accuracy for the three types of object – token invariant, token variable or unfamiliar. At farther distances (50–100 metres), accuracy of distance perception was poorer overall. However, participants were more accurate at judging the distance of the token invariant objects than the other two types from further away. The accuracy was poorest for the unfamiliar objects as participants had no prior experience of these objects to draw on.

To summarise, they found that in relation to distance perception:

- familiar invariant objects gave distance cues more than variant or unfamiliar objects
- previous knowledge that helped size perception also helped the estimation of distance, regardless of whether the objects were 'variable' or not in size
- there was some information from invariant objects that did help distance variation.

Try it

Try a mini replication of Haber and Levin's (2001) study for yourself. Gather together some objects. Use some items you could categorise as token invariant, some you could class as token variable and then create some cardboard shapes. Take them out to an open area and set up the three sections as Haber and Levin did. Try investigating if there is any difference between males and females on judging the size and distance of objects, or whether it is easier to judge the distance of familiar objects versus unfamiliar ones.

Perception – How do you interpret the world around you?

Conclusion

The results of Experiment 2 suggest that we use familiar size information to help us when judging distance. This means that size perception has an influence on depth perception, possibly because we draw on past experiences to estimate how far away objects are.

Overall conclusion

The results of the two experiments show that we use familiarity with objects to help us perceive the size and the distance of objects. When objects naturally have very little variation in size, we can use our past experiences of these objects to judge both size and distance more accurately. Haber and Levin suggested that the results of these two experiments indicate that more research should be done to understand the perception of size and how different processes control perception of size compared to perception of depth.

Apply it

Jan was waiting impatiently for the ferry to come and take her across to the island. She was not sure whether it would be a large car ferry or a smaller passenger ferry. She could see what might be a large boat in the distance on the horizon, but could not make out whether it was her ferry or just a container ship.

Use ideas from Haber and Levin's (2001) study to explain how Jan might be able to distinguish more easily between a container ship and her ferry if she knew more about it, such as it being a small passenger ferry.

Strengths and weaknesses of the study

One strength of this study is the use of a visual screening test to choose participants for Experiment 2. The male participants were given a screening test to check that they had good vision before they took part in the size and distance tasks on the field. This means that we know that all participants had the same minimum level of vision, which gives the gathered data more validity.

Another strength is that when Haber and Levin compiled the list of 30 familiar items, the level of 'familiarity' was judged independently before it was included on the list. By checking that people were likely to know these objects and would have seen them a lot before the study, we can be sure that the researchers were actually testing the influence of familiarity on size and distance perception.

One weakness of the study is that the sample used in Experiment 2 is small, making generalisation difficult. They only used nine participants, and all of them were male. We cannot be sure, therefore, that the participants represent the whole population and that females would perceive size and distance in the same way.

Link it up

For more information on validity and generalisability, see Topic 11 *Research methods*.

Another weakness is that we do not know how familiar each object was to the participants, despite the lengths the researchers went to in order to ensure familiarity. Some participants may have had more experience with some of the objects than others, and this could have affected the results. The more they had seen the objects before, the better they would be at judging both size and distance.

Sum it up

This research shows that when we are familiar with an object, we are quite accurate at estimating both its size and how far away it is. This could have implications for drivers because they have to use past experiences of different vehicles, buildings and objects to be able to accurately judge how far away other vehicles are from them, and how fast they are travelling. This research suggests that people are more accurate in these judgements when they are looking at objects they are familiar with. If they see a car they know from past experience, they are able to judge its size and distance more accurately and this helps them to work out how fast it is travelling. If, however, they are looking at a vehicle that they do not have past experience with, these judgements are more difficult.

Carmichael, Hogan and Walter (1932) An Experimental Study of the Effect of Language on the Reproduction of Visually Perceived Form

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to the study

Research has shown that when people try to recreate or draw an object they saw earlier, the object is often distorted in some way. Further to this, research suggests that items that had been seen would often be changed mentally, based on something that the object reminded the person of or something they were more familiar with. Some research has also found that when objects were shown visually and then described by the person, the way they were described affected how they were reproduced later on. For example, if a circular object was described as ‘looking a bit like a bicycle wheel’ and they were asked to draw the object at a later date, it is likely that they would draw something that resembles a bicycle wheel.

Aims

To see if the words used to describe an ambiguous object could affect the way participants would later redraw the image. Leonard Carmichael, Helena Hogan and A.A. Walter’s (1932) study aimed to focus specifically on the influence of language on how visual images were perceived, by controlling other possible influences wherever possible.

Procedure

There were 95 participants (60 females, 35 males) who were divided into three groups, all containing a fairly even mix of males and females. All three groups were shown a visual display of 12 stimulus figures, which were black line drawings on white card (Figure 8.10).

The pictures were shown on a white cardboard disc, 19 cm in diameter, divided into 30 sections. A picture













1	Curtains in a window		Diamond in a rectangle
2	Bottle		Stirrup
3	Crescent moon		Letter 'C'
4	Bee hive		Hat
5	Eye glasses		Dumbbells
6	Seven		Four
7	Ship's wheel		Sun
8	Hourglass		Table
9	Kidney bean		Canoe
10	Pine tree		Trowel
11	Gun		Broom
12	Two		Eight

Figure 8.10 The 12 stimulus figures

was placed on every other sector of the disc and then there was a gap of seven blank sectors between the last in the sequence and the first one being shown again. When the pictures were shown to two of the groups of participants, a word or phrase was heard just before the picture appeared. So when the blank sector of the circle appeared just before the image, they heard the words ‘The next picture resembles...’ and then the word or phrase. The first group (48 participants) heard the first version of the word list to accompany the pictures. The second group (38 participants) heard the second version of the word list alongside the pictures. For example, one of the pictures was of two circles joined by a straight line; Group 1 was told this looked like spectacles, while Group 2 was told this looks like dumb-bells. The third group was a control group of nine participants who saw the pictures but without hearing any words.

Perception – How do you interpret the world around you?

Try it

Get a set of ambiguous pen-and-ink line drawings like those used by Carmichael, Hogan and Walter and come up with a list of words that could describe what they look like. Show the pictures to one group and get them to redraw them. Then show the same pictures to another group, but this time tell them what you think they look like, then get them to redraw the pictures. Compare the drawings from your two groups to see if you notice any differences.

Figure	Percentage similarity	
	List 1	List 2
1	47	78
2	100	69
3	65	48
4	69	75
5	45	81
6	87	94
7	54	47
8	83	100
9	90	63
10	86	100
11	76	85
12	87	40
Total	74	73

Table 8.2 This table shows the ratings of how similar the participants' drawings were to the word they had heard to describe the image they had seen.

After the participants had seen all 12 pictures, they were asked to try to draw the pictures as clearly as they could in any order. If they could not draw any of the images, they were allowed to see the pictures again until they could draw them all clearly. For Groups 1 and 2, who heard the word lists, it took between two and eight showings, with an average of three. For the control group, the average number of viewings was four.

Once all the participants had drawn the pictures, two of the researchers independently rated each of them on a 5-point scale for accuracy (1 = an almost perfect replica of the original image; 5 = drawing had completely changed from the original picture).

Results

The researchers focused on the participants' drawings that were rated as 5 – those that were distorted most from the original picture. They compared the participants' drawings to the shape of the object from the word lists Group 1 and Group 2 had heard. In Group 1, 74 per cent of the pictures drawn by participants resembled the shape of the object the participants were told the image looked like. In Group 2, 73 per cent showed a strong resemblance to the descriptions they had heard (Table 8.2). In the control group, only 45 per cent of the drawings looked like either of the items named in the lists read to Groups 1 or 2.

Conclusion

The results of the study seem to show that the way a visual image is described to someone will affect how they reproduce that image when asked to draw it. This suggests that the words read to the participants affected the way the picture was perceived.

Link it up

See Topic 10 *Language, thought and communication* to find out more about how words, descriptions and images are linked.

Strengths and weaknesses of the study

One strength of the study is that the researchers used a control group to check that it was the word list that distorted the participants' drawings, not that the pictures they had seen were ambiguous. By comparing the groups who heard the word lists with another group who did not hear any description of the images, it was easier to identify whether it was the language that changed the way they perceived the images.

The researchers rated the accuracy and the similarity to the word list descriptions independently; they rated them separately and then compared their ratings. If they significantly disagreed on their ratings then they asked another researcher to rate them as well. This means that they were trying to make the ratings reliable.

One weakness of the procedure is that participants were able to see the pictures as many times as they needed until they could redraw the image clearly. This meant that there was a difference in how many times each participant saw the images. The more times the pictures were seen, the more accurate the drawings could have been, which makes the results unreliable because not everyone saw them the same number of times.

Another weakness is that the ratings of accuracy and the ratings of similarity to the words lists were both done by the researchers, who knew the aims of the study. This means there could have been bias in how the judgements were made because the researchers could have changed their ratings to fit what they expected the results to show.

Link it up

For more information on reliability and bias, see Topic 11 *Research methods*.

Sum it up

The conclusion of this study suggests that how we perceive and recreate an object in our mind will be affected by the way that object or image has been described. This could have implications for criminal investigations if the police are trying to get information from eyewitnesses who saw something at a crime scene. The officers interviewing the witness could use language to describe a person or object that they want information about, such as 'Can you describe the older man at the scene?'. These descriptions could easily distort the witnesses' original perception of the criminal or the scene and so their testimonies would be wrong.

Link it up

Eyewitness testimony is discussed in more detail in Topic 2 *Memory*.

Exam-style question

Alexi and his class have done an experiment on visual perception as part of their psychology course. They gave participants a list of five ambiguous images that they would then have to draw later. Half the participants were told that the pictures looked like something, such as a triangular shape looking like an ice-cream cone, while the other half were told nothing. When the participants were asked to draw the pictures, the half who were told nothing drew pictures that looked very similar to the originals. The half who saw the pictures and were told that they looked like something, drew pictures that looked more like what they had been told than the original picture.

Assess whether the findings from Carmichael, Hogan and Walter (1932) can explain the results of Alexi's experiment.

(9 marks)

Exam tip

'Assess' questions for 9 marks require extended writing so use full sentences and paragraphs in your answer. Three marks will be available for AO1, 3 marks for AO2 and 3 marks for AO3.

Link it up

For more information on Assessment Objectives, see *Preparing for your Exam 1*.

Psychology in action

Visual media, such as television and film, use a lot of research into perception to deliver experiences to the viewer. In recent years, 3D films have become popular in cinemas, and 3D televisions are now finding their way into more homes. These screens, and the glasses worn to view them, distort our vision by projecting images into our eyes that give the impression that the image we are seeing is 3-dimensional rather than 2-dimensional. For example, they might use optic flow patterns and depth perception cues to make us perceive particular movements or changes in depth and distance perception. These effects are often used in all forms of visual media for this purpose. The addition of 3D glasses, which distort the visual information slightly, tricks our brain into perceiving that we are almost 'in' the image we are seeing.



Topic 9 | Sleep and dreaming – Why do you need to sleep and dream?

Exploring the topic

Our lives consist of periods of waking and sleeping. A lot of psychology focuses on when we are awake, for example looking at our development, memory and psychological problems. However, we also need to study sleep, during which we have periods of dreaming.

We know that humans need to sleep because we can see how things go wrong when people are sleep-deprived. For example, serious incidents have happened during night shifts at Chernobyl (1986) and Three Mile Island (1979) nuclear power plants. A lot of people work night shifts and it is useful to know what shift patterns work best for people. Babies sleep for about 16 hours at first and this drops to an average of between 7 and 8 hours for adults, suggesting that sleep helps in our development.

Dreams have been used to explain mental health issues. Some researchers, however, claim that dreams are simply the brain making sense of random thoughts. You might have thought about dreams containing meaningful symbols that relate to our lives.

This brief exploration of issues around sleep and dreaming hopefully helps to show the importance of the question: 'Why do we need to sleep and dream?'.

Your learning

In this topic you will learn about:

- the features, functions and benefits of sleep
- the internal and external influences on sleep and the strengths and weaknesses of the explanations
- the symptoms of and explanations for the sleep disorders insomnia and narcolepsy
- Freudian theory of dreaming (Freud, 1900) and the strengths and weaknesses of the theory
- activation-synthesis theory (Hobson and McCarley, 1977) and the strengths and weaknesses of the theory
- studies investigating sleeping and dreaming by Freud (1909) and Siffre (1975).

Getting started

To start off your investigation into sleep and dreaming, try keeping a sleep and/or a dream diary.

- In your sleep diary, write down each morning what time you went to sleep the night before and when you woke up, so that you know how long you slept for. You could make notes about what you did the day before so that you get to know your own sleeping patterns and perhaps what affects your sleep.
- In your dream diary, log any dreams you remember and look for patterns, for example in the type of dream you have.

Ask people about their sleep patterns. See if shift work, age or other issues seem to affect them. Be sure to adhere to ethical guidelines when approaching people, such as getting their informed consent and giving them the right to withdraw from your study of sleep patterns.



What problems might people working in the dark face when not at work?

Sleep and dreaming – Why do you need to sleep and dream?

Features, functions and benefits of sleep

What you will learn

- The four stages of sleep, including REM sleep.
- The sleep cycle.
- Functions and benefits of sleep.
- The strengths and weaknesses of sleep cycle explanations.

The four stages of sleep and REM sleep

There are four stages of sleep, with **REM sleep** forming a fifth part of the **sleep cycle**. These stages appear more than once throughout a night's sleep. Differences in brain activity help to characterise sleep stages. This brain activity can be measured using an EEG (electroencephalograph).

The four stages of sleep

Our sleep starts by taking us from stage 1 of the sleep cycle to stage 4. After this, there is normally a repetition of the stages, mainly of stages 3 and 4, and also of REM sleep. Sleep in stages 1–4 is called **NREM sleep**. Through the night, we move through the different stages.

- **Stage 1** (sleep onset): this is light sleep and you can be easily woken up during this stage. Muscles are less active, eye movements slow and you can twitch suddenly. You go through alpha and theta brainwaves. Alpha brain activity is restful ('idling') and theta waves characterise a period between wake and sleep.
- **Stage 2** (called the 'late night stage'): your brainwaves are slower, mainly theta waves, eye movements stop, and there are bursts of brain activity (spindles). Body temperature starts to drop and heart rate slows. This stage is found as you move into sleep from light sleep (stage 1).

Stages 3 and 4 are often merged (some say there are just three stages of sleep).

- **Stage 3** (deep sleep): there are slow delta brainwaves, but also some faster waves. This stage is between light and deep sleep.
- **Stage 4** (deep sleep): almost all waves are slow delta waves. It is very hard to wake you in stages 3 and 4, as this is deep sleep. There are no eye movements and when woken up, you can feel disoriented. Children can experience sleepwalking or night terrors when they are in deep sleep.

REM sleep

REM sleep is when there is rapid eye movement – the eyelids can be seen flickering quickly. Dreaming seems to occur during this time. Each night, we tend to spend about 2 hours of our sleep dreaming.

During REM sleep, incoming information from the senses (sight, sound, touch, taste and smell) is blocked. This is known as **sensory blockade**. REM sleep starts with signals in the pons, at the base of the brain, which shuts off **neurons** in the spinal cord, preventing movement. This is known as **movement inhibition**. REM sleep is characterised as having rapid, shallow and irregular breathing with eyes jerking and muscles paralysed. Heart rate and blood pressure rise and dreaming can occur.

Key terms

REM sleep: part of the sleep cycle with rapid eye movements caused by eyes moving a lot behind the eyelids when dreaming occurs.

Sleep cycle: a nightly pattern of deep sleep, light sleep and dreaming.

NREM sleep: non-rapid eye movement sleep (rapid eye movements do not occur).

Sensory blockade: in REM sleep, all incoming sensory information is stopped.

Neuron: a nerve cell that transmits information.

Movement inhibition: in REM sleep, when movement is prevented.

The sleep cycle

In one night's sleep, you will go through about five cycles of the stages and REM sleep (Figure 9.1). A cycle of sleep lasts about 90 minutes. The first cycle has a short REM period and more deep sleep (stages 3 and 4). As the cycles progress, REM sleep lasts longer (up to an hour) and there is less deep sleep, so that towards the morning we are mostly in stages 1 and 2 and REM sleep.

Functions and benefits of sleep

Adults tend to need about 7 or 8 hours of sleep, while teenagers need about 9 hours. It is possible for people to catch up on sleep after being deprived of it. People often find that over the age of 65 deep sleep stops, possibly because of age or medication. If people fall asleep during the day, or immediately when they go to bed, this suggests that they are sleep deprived. **Sleep deprivation** means a person will not function as well at a high level, which may affect driving and work tasks. Animal studies suggest that sleep is needed for survival. For example, rats can die after about 3 weeks if deprived of all sleep. Our brain chemistry is affected if we have too little sleep, and sleep is thought to help neurons repair themselves. Deep sleep can also help to avoid the breakdown of proteins.

About 20 per cent of our sleep is REM sleep, though for infants REM sleep accounts for nearly 50 per cent of their sleep. REM sleep stimulates learning and is associated with an increase of proteins, so it is important. William Dement and Nathaniel Kleitman (1957) found that people tended to report dreaming when woken up in REM sleep, and so concluded that dreaming takes place in REM sleep. However, some participants did not report dreaming when woken up from REM sleep and some reported dreaming in NREM sleep, so this is not an easy area to study or draw conclusions about.

Key term

Sleep deprivation: not having enough sleep; this can affect physical functioning such as weight and brain functioning.

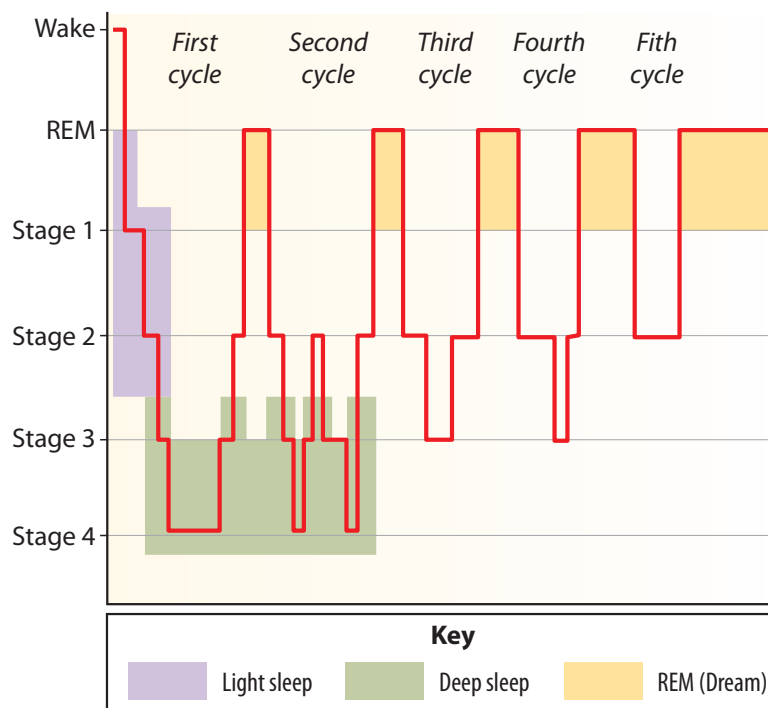


Figure 9.1 When is the longest dreaming period in a night's sleep and when would you be harder to wake? Does this idea of when you sleep more deeply match your experiences?

Sleep and dreaming – Why do you need to sleep and dream?

Key terms

Circadian rhythms: human body rhythms that have a daily (24-hour) cycle, such as the sleep–wake cycle.

Sleep–wake cycle: a circadian/daily rhythm generally triggered by the day–night cycle.

Ultradian rhythms: rhythms that occur in a period of less than 24 hours, such as a sleep cycle.

Try it

Keep a diary of your body temperature over the day for a week, and note when you feel colder. See if you feel colder in the afternoon and when you are getting ready to sleep. You could take your temperature and use a chart to map it.

Exam-style question

Explain the difference between the sleep cycle and the sleep–wake cycle. **(4 marks)**

Exam tip

This question highlights the importance of understanding terms and being able to explain them. You may wish to create your own glossary of terms. The advantage of this is that the explanations will be in your own words to aid your understanding.

Internal and external influences on sleep

What you will learn

- Bodily rhythms and sleep, including circadian and ultradian rhythms.
- Hormones, including the pineal gland and melatonin.
- Zeitgebers, including light, relating to the sleep–wake cycle.
- The strengths and weaknesses of bodily rhythms and hormones as 'internal' explanations, and of zeitgebers as 'external' explanations.

Circadian rhythms

Bodily rhythms are biological (internal) rhythms that can happen daily, monthly or annually.

'Circadian' means 'around a day'; **circadian rhythms** are daily rhythms. These include body temperature, the **sleep–wake cycle** and some hormonal changes. The suprachiasmatic nuclei (SCN), found in the middle of the brain, control circadian rhythms. The SCN is set by external triggers such as sunlight and other clues to time, discussed later in this section.

Body temperature

Body temperature and the sleep–wake cycle are in tune. Body temperature rises near the end of sleep and drops when we get ready to sleep at the end of the day. It also drops in the afternoon.

Sleep–wake cycle

The sleep–wake cycle consists of a daily cycle from being awake to sleeping; this is around a 24-hour cycle.

- Jet lag affects the sleep–wake cycle and happens when we cross time zones. Our sleep–wake cycle is triggered by light and time cues. When we are in a different time zone, these cues are different for us, such as it being light outside at the time when we would be 'set' to sleep. This can cause daytime irritability and poor concentration, underlining the importance of the sleep–wake cycle for normal functioning.
- Shift work also affects the sleep–wake cycle. People doing shift work change what they do at different times in the day, such as having to work when it is dark. Cues to time and light are different and this affects their biological rhythms, including their sleep–wake cycle.

Ultradian rhythms

Ultradian rhythms are those lasting less than 24 hours, such as the sleep cycle, which consists of about 5 cycles of 90 minute periods of different stages of sleep. Heart rate, blood circulation and appetite are also ultradian bodily rhythms. As well as the sleep cycle, other ultradian rhythms can affect our sleep–wake cycle, such as thinking it is time to wake when we are hungry.

Internal influences on sleep

The suprachiasmatic nuclei (SCN) are affected by both internal and external influences. Our internal biological clock is **endogenous** and it keeps biological rhythms synchronised. Circadian and ultradian rhythms are other internal influences on sleep, including hormones, yet they are affected by external influences.

Hormones

Sleep helps to reset **hormones** and what we do in the day affects our hormone levels. Hormones send chemical messages around the body using the bloodstream. For example, adrenaline is a hormone that governs the fight-or-flight response to danger and makes us feel alert, which in turn makes it hard to fall asleep.

Hormones can affect sleep because of stress. When we are under stress, adrenocorticotrophic hormone (ACTH) in the pituitary gland releases cortisol, which causes alertness and so can affect sleep. Studies have found that there is more adrenocorticotrophic hormone in people with insomnia (an inability to sleep) than in people who sleep well.

Pineal gland and melatonin

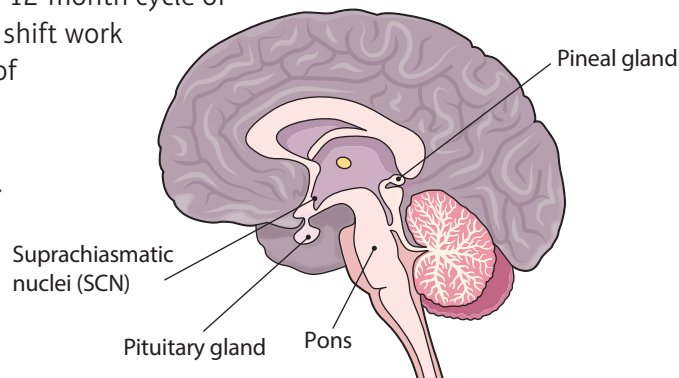
Melatonin is a hormone that signals the need for sleep and is produced in the **pineal gland** (Figure 9.2). Melatonin is triggered by darkness. In animals, it is involved in the synchronising of circadian rhythms, such as the sleep–wake cycle and blood pressure. Melatonin can be used as a medication to help with insomnia and with jet lag, though its benefits are questionable when used for shift workers. The pineal gland regulates sleep–wake patterns, which in turn affect stress levels and physical performance.

External influences on sleep

External influences are environmental features such as light and other time cues. External factors can include environmental stress, what we eat and drink, as well as any medication we are on. External cues are **exogenous**.

Zeitgebers including light

Zeitgebers, meaning ‘time givers’, are environmental or external cues that regulate the body’s circadian rhythms. Zeitgebers include the light–dark cycle and the 12-month cycle of the seasons. Jet lag and shift work change our experience of zeitgebers, and such changes can affect our mood and performance.



Key terms

Endogenous: internal pacemakers; our biological clock.

Hormones: chemical messengers taking messages through the bloodstream.

Melatonin: a hormone involved in setting circadian rhythms, including the sleep–wake cycle and blood pressure.

Pineal gland: a small endocrine gland that produces melatonin. An endocrine gland produces a hormone that is secreted into the bloodstream.

Exogenous: external cues in the environment that affect our biological clock.

Zeitgebers: external cues that synchronise our biological rhythms; for example, to a 24-hour clock.

Figure 9.2 The brain showing the location of the pituitary and pineal glands, the pons and the suprachiasmatic nuclei (SCN)

Sleep and dreaming – Why do you need to sleep and dream?

The main zeitgeber is light. Light comes into our eyes and light sensitive cells in the retina of the eye let the internal body clock know whether it is day or night. Light can prevent us from falling asleep. Jeanne Duffy and Charles Czeisler (2009) discuss **entrainment**, which is the term for how our body clock is reset over a 24-hour period to fit in with external cues about time. Entrainment is done through changes to light and dark and relates to when light occurs, how long it lasts and its wavelength. Other time-related cues include when someone is hungry.

Key term

Entrainment: when biological rhythms are matched to their environmental triggers, such as circadian rhythms being set in response to external (light) cues.

Apply it

Ava works shifts and cannot understand why she cannot sleep during the day. Using your understanding of the sleep–wake cycle, explain to Ava why she is having problems sleeping.

Strengths and weaknesses of the internal influences on sleep explanation

Strengths

- There is evidence from animals that the suprachiasmatic nuclei (SCN) have the role of setting the biological clock. For example, if the SCN is removed from hamsters their bodily rhythms stop, meaning their sleep–wake patterns become random. If they have a transplanted SCN from other hamsters their rhythms start again and their cycles return to normal.
- There is also evidence from humans. A study by Miles et al (1977) looked at a blind man whose bodily rhythm was nearer to 25 hours, suggesting we have circadian rhythms governed by internal factors. If people who do not perceive light reset their clock then the way light is received must be complex.
- Li-You Chen et al (2015) confirm that the pineal hormone melatonin is important for controlling sleep. The study, using rats, found that early sleep deprivation (ESD) led to reduction in melatonin levels. The researchers suggested that a way of preventing this reduction is to give children melatonin supplements. Such studies support the suggestion that melatonin influences sleep.

Weaknesses

- Much of the evidence is from animal studies and there can be problems generalising this to humans.
- The evidence relating to human blindness is weak. There are individual differences in 'being blind' and it can be difficult to draw conclusions leading to universal explanations. For example, people with NLP blindness might perceive light and colours (e.g. Rose, 2015).

Strengths and weaknesses of the external influences on sleep explanation

Strengths

- There are practical applications for understanding body clocks in humans. Understanding zeitgebers can help shift workers, for example by darkening their bedroom in the daytime.
- Ralph Mistlberger and Debra Skene (2004) agree that light is the main way bodily rhythms are synchronised to an individual's day and night times. They add that social stimuli, such as exercise, are also cues to time. Social stimuli can be linked to levels of arousal and what someone is doing affects how awake they are. Mistlberger and Skene say that compared to light as a zeitgeber, cues (such as social cues) are not strong. This is evidence for external cues acting as zeitgebers and for light being a main zeitgeber although this review does conclude that more needs to be known.

Weaknesses

- A weakness of the explanation relating to light as an external influence on sleep is that there are differences in findings. Siffre (1975) wanted to check the findings of studies that claim a 'natural' sleep–wake cycle could be 48 hours, when other studies suggest it is nearer to the expected 24 hours. It is hard to draw firm conclusions about the sleep–wake cycle and the role of zeitgebers when results of studies differ.
- Studies like Siffre's are sleep-deprivation studies, so the situation is not 'natural' and there may be a lack of validity. A weakness is in the way studies to investigate the effects of zeitgebers are carried out. For example, in studies where participants were in a cave without zeitgebers, researchers used strong artificial light, which would have affected their sleep–wake cycle.

Link it up

Michel Siffre's (1975) cave study in the *Studies* section discusses what it is like to be without cues to light. Read ahead to find out more.

Symptoms and explanations of sleep disorders

What you will learn

- Symptoms and explanations of insomnia.
- Symptoms and explanations of narcolepsy.

Sleep disorders can be primary or secondary. In primary sleep disorders, the disorder is the problem, as in **insomnia**. In secondary sleep disorders, problems with sleep are symptoms of another disorder, such as depression.

Insomnia

Insomnia refers to problems with sleeping. It can affect around one in three people and is often found in older people. Acute insomnia refers to a brief period of problems with sleep. Chronic insomnia is when difficulty with sleep occurs three or more nights a week, lasting at least 3 months. This pattern of insomnia may need treatment.

Symptoms

Insomnia is characterised by issues such as:

- difficulty with falling asleep
- waking up a lot during the night
- frequently lying awake during the night
- not feeling refreshed on waking
- finding it hard to fall asleep in the day when tired
- feeling irritable and unable to concentrate.

Explaining insomnia

Insomnia can be caused by lifestyle, including issues with environment, health conditions and what is taken into the body.

- Lifestyles that include flying frequently and having jet lag or working shifts can affect bodily rhythms.
- Health conditions: mental and physical ill health, such as depression or heart problems, can contribute to insomnia.

- Medication, food and drink: being awake and being asleep mean we are under the influence of different neurotransmitters and hormones. Anything that affects these, such as medication, food or drink, can affect sleep and wake patterns. Caffeine and diet pills, for example, can contribute to insomnia. Antidepressants can stop REM sleep and smoking cigarettes can also affect sleep. Alcohol keeps people in the light sleep stages where they can easily wake up.

Develop it

Carry out research to find out which mental and physical health conditions have insomnia as a symptom. See if treatment for the conditions might be what leads to the insomnia.

Link it up

Neurotransmitter functioning is discussed in Topic 4 *The brain and neuropsychology*.

Narcolepsy

Narcolepsy is a disorder where a person has no control over their sleep–wake cycle. Not only is there daytime sleepiness, but also a person with narcolepsy can fall asleep suddenly at any time without being able to control such attacks. Narcolepsy affects both males and females equally and is found in about one person in every 2000 people. It is a neurological disorder – it seems to come from problems with neurological (brain) functioning.

Key terms

Insomnia: problems with sleeping at night that cause difficulties during the day.

Narcolepsy: inability to control sleeping and waking, so experiencing involuntary daytime sleeping.

Symptoms

- Excessive daytime sleepiness (EDS): someone with narcolepsy feels extreme sleepiness and can fall into an uncontrollable daytime sleep at any time.

Sleep and dreaming – Why do you need to sleep and dream?

- **Hallucinations** and vivid dreams: hallucinations involve experiencing something that is not there, such as a feeling of danger. Narcolepsy can also bring vivid dreaming and separating dreams from reality can become difficult.
- Around 70 per cent of people with narcolepsy experience **cataplexy**, which means they experience loss of muscle power (in their arms, for example) and a loss of muscle tone due to an onset of strong emotions, such as laughter.
- Sleep paralysis and abnormal REM sleep: cataplexy often occurs with sleep paralysis, which is the prevention of movement that happens in REM sleep, but cataplexy can occur at any time – while awake or asleep.

Explaining narcolepsy

Narcolepsy is explained by: a lack of hypocretin, genetic influences, stress and evolution.

- Brain chemicals: hypocretin, also called orexin, is a chemical in the brain that keeps us awake and regulates the sleep–wake cycle. In narcolepsy, the cells in the hypothalamus that produce hypocretin are damaged or missing, which can lead to EDS and other symptoms of narcolepsy.
- Genes: in about 10 per cent of people with narcolepsy, there are other family members who also have

the disorder. This may relate to the hypothalamus problem. Variations in chromosome 6, called the HLA complex, appear to be involved in narcolepsy.

- Stress or trauma: Wayne Barker (1948) looked at situational stress and narcolepsy and made a link between them.
- Evolution: it might be advantageous for an animal (and human) to stay very still to stay alive, so muscle paralysis can be a survival characteristic. Narcolepsy might relate to human REM sleep, which has a survival value.

Develop it

Find out more about sleep disorders (insomnia and narcolepsy), symptoms, explanations and treatments. Look at the NHS site and the National Institute for Health (NIH) site for more information.

Apply it

Dom's workmates are worried because he falls asleep without warning, often when he is at work. He works as a carpenter and uses sharp tools so they are worried that he will harm himself. They encourage him to go to his doctor.

What symptoms would a doctor look for if they thought that Dom's problem might be narcolepsy?



Key terms

Hallucinations: seeing, hearing, smelling, tasting or feeling something that is not there, such as seeing monsters.

Cataplexy: a loss of muscle power and tone, triggered by an onset of strong emotions such as laughter.

This person is undergoing sleep testing in a sleep lab to find out how quickly they fall asleep. What problems do you think there are in drawing conclusions from sleep lab studies?

Freud's (1900) theory of dreaming

What you will learn

- Freud's (1900) theory of how dreams are used to access the unconscious.
- The manifest and latent content of dreams, and dreamwork.
- The strengths and weaknesses of the theory.

Sigmund Freud was a medical doctor working in Austria in the early 1900s. He saw how treatment for people with mental health issues had little success. He began to see that mental health issues could be anxieties, which, through talking about them, could be 'released'. His patients' stories became his case studies, and from these Freud built his theory.

The importance of the unconscious

Dreams, according to Freud, involve symbols that mean something to the dreamer and need to be analysed by a professional (psychoanalyst) to uncover that meaning. The conscious mind is what we are already aware of and the preconscious is what we can make ourselves aware of with some thinking. According to Freud, the **unconscious mind** accounts for about 90 per cent of our thinking and holds all thoughts and wishes not in the conscious or preconscious. We repress thoughts that challenge us into our unconscious. For Freud, these were often sexual wishes and desires, which were not acceptable at that time.

Develop it

Look up treatments for the mentally ill in the early 1900s to see what it was like in Freud's time.

Key term

Unconscious mind: an inaccessible part of the mind that affects behaviour and feelings.



Do you think a psychoanalyst could find out enough from listening to his patients to be able to draw conclusions about their unconscious thoughts and wishes?

Sleep and dreaming – Why do you need to sleep and dream?

Dreams reveal unconscious wishes and desires

Dreaming can uncover unconscious wishes. When we understand these wishes they are released from our unconscious. At this point, they no longer take up our energy, which has been used to hide or repress them. This then frees us from anxiety and mental health issues.

Unconscious wishes and desires are held in what Freud called the '**id**', shown by a baby's 'I want' thinking. A child develops a moral conscience from things such as parental guidance and rules, which could be called 'you cannot have' thinking. Freud called this thinking the '**superego**'. The child's personality is completed by the '**ego**', which makes decisions to balance the id and superego's demands. One way balance is achieved is when the ego uses defence mechanisms such as repression – in other words, not remembering.

Manifest and latent content of dreams

The **manifest content** of a dream is the story of the dream that the dreamer tells. It is the dream content (the things you see in the dream). The **latent content** is the meaning of the dream, hidden behind the manifest content. It is the latent content that uncovers unconscious thinking and on which dream analysis focuses. The psychoanalyst analyses the manifest content of a dream to look for symbols that are hiding the latent content. In using dreams, underlying wishes can be interpreted. A dream can also be wish-fulfilment.

Dreamwork

Dreamwork refers to the way the mind keeps unconscious thoughts hidden during dreaming. This is to protect the individual and to keep them asleep by disguising repressed thoughts and ideas. Dreamwork has also been used as a term for uncovering meaning behind dreams (see Table 9.1), but in Freud's theory it refers to the protective work of the mind during dreams. Dreamwork consists of condensation, displacement and secondary elaboration (also called 'secondary revision').

- Condensation – many ideas appear as one idea in a dream. These separate elements are important in uncovering repressed material, so the one idea needs to be unpicked.
- Displacement – in a dream, something unimportant seems to be important, shifting attention away from the important thing. For example, a new aim or a new person becomes the focus to move away from something threatening.
- Secondary elaboration – using muddled ideas from dreamwork to build a whole story. The mind will add bits to the dream in order for it to make sense. This gets in the way of understanding the latent content of the dream.

Symbols

Freud interpreted individual dreams using symbols that had meaning for the individual, so the same feature could have different symbolic meaning for different people. The psychoanalyst has to know the person's history and situation in order to interpret their dreams.

Key terms

Id: the part of Freud's personality theory that is demanding, thought of as 'I want...'.

Superego: the part of Freud's personality theory that is the conscience, thought of as 'you can't have...'.

Ego: the part of Freud's personality theory that is reasoning, to balance demands of the id and superego.

Manifest content: the story the dreamer tells of what happens in a dream.

Latent content: the deeper meaning behind what it is said the dream is about.

Dreamwork: the transformation of unconscious thoughts into dream content.

Dreamwork	Possible features
Beatrice sat up suddenly in bed after another strange dream: an eagle swooping to pick up a mouse, just missing it, the mouse running, just reaching shelter, insects buzzing around as if to attack the eagle. A house nearby, a baby crying outside, the eagle refusing to go away. What did it mean?	<i>Condensation:</i> Insects 'buzzing around' could be one idea hiding many, such as attacking to protect, feeling reluctant to do so, making a lot of noise, feeling helpless.
	<i>Displacement:</i> The focus is on the eagle, but perhaps it is the running mouse that is the main feature.
	<i>Secondary elaboration:</i> In the interpretation, the eagle, mouse and insects seem to make a story but the house and baby do not 'fit'. Perhaps the whole dream was told as a story to help it make sense.
	<i>Other ideas:</i> Note Beatrice could be called 'Bee' for short, linking to the theme of insects. You would need to know more about her family to interpret the importance of the baby.

Table 9.1 An example of dreamwork and analysis

Try it

You cannot really analyse your own dreams. However, if you wake up with a particular dream clear in your mind, write it down and see, privately, if you can make some sense of it given what is going on in your life.

Strengths and weaknesses of Freud's theory of dreaming

A strength of Freud's theory is that his data was qualitative, detailed and focused on real individuals, so there was validity in the findings. The data is interpreted by the analyst, which could affect validity, however, the patients' involvement meant any interpretation could be accepted by the patient, strengthening validity. Another strength is that he saw the power of the unconscious, which could not easily be studied, and found a way of studying it. This was a unique approach. His patients talked about recurring dreams, which gave him the idea of studying their dreams.

It is a strength that there is some evidence to support Freud's theory that dreams 'guard' sleep. Guénolé et al. (2013) found that people reported more dreaming if they heard noise and were stimulated by it while asleep and then woke, as opposed to people waking without the stimulation. It seems that the noise did not wake them because dreaming kept them asleep.

Freud's ideas about dreaming cannot easily be tested, so cannot be shown to be true or false, which is a weakness. The concepts, such as the unconscious or dreamwork, cannot be measured objectively and so his theory is unscientific. Another weakness is that case studies were used, such as Little Hans, and so each analysis was unique to the individual. This means results cannot be generalised to a wider population.

Link it up

Qualitative data and validity are discussed in Topic 11 *Research methods*.

Link it up

Freud's (1909) study of Little Hans is discussed in the *Studies* section. Read ahead to find out more.

Hobson and McCarley's (1977) activation-synthesis theory of dreaming

What you will learn

- A biological theory of dreaming, focusing on random activation in the brain, sensory blockade and movement inhibition.
- The strengths and weaknesses of the theory.

J. Allan Hobson and Robert McCarley's (1977) theory is neurobiological in that it uses brain functioning to explain dreaming.

Activation synthesis

Hobson and McCarley put forward the activation-synthesis theory of dreaming. They pointed out that the brain is active during REM sleep where our muscles are not working and so there is paralysis (movement inhibition). Also, during REM sleep, sensory information is not coming into the brain (sensory blockade). However, random thoughts are sent. These random thoughts form the 'activation' part of the theory. They come from neurons in the brain being randomly activated and 'firing', which means an electrical impulse in a neuron releases neurochemicals. These cross the synaptic gap and messages (thoughts) are sent.

For Hobson and McCarley, random thoughts are what we dream and these dreams seem to make sense. This is the 'synthesis' (putting together) part of the theory. The firing of the neurons, which send the random thoughts, is seen as internally generated information (Figure 9.3). The brain generates 'nonsense' and then automatically works to make sense of it (as it would work to make sense of externally generated information from the senses).

Link it up

For more information on REM sleep, movement inhibition and sensory blockade, see the *Features, function and benefits of sleep* section at the beginning of this topic. Synaptic transmission is explained in Topic 4 *The brain and neuropsychology*.

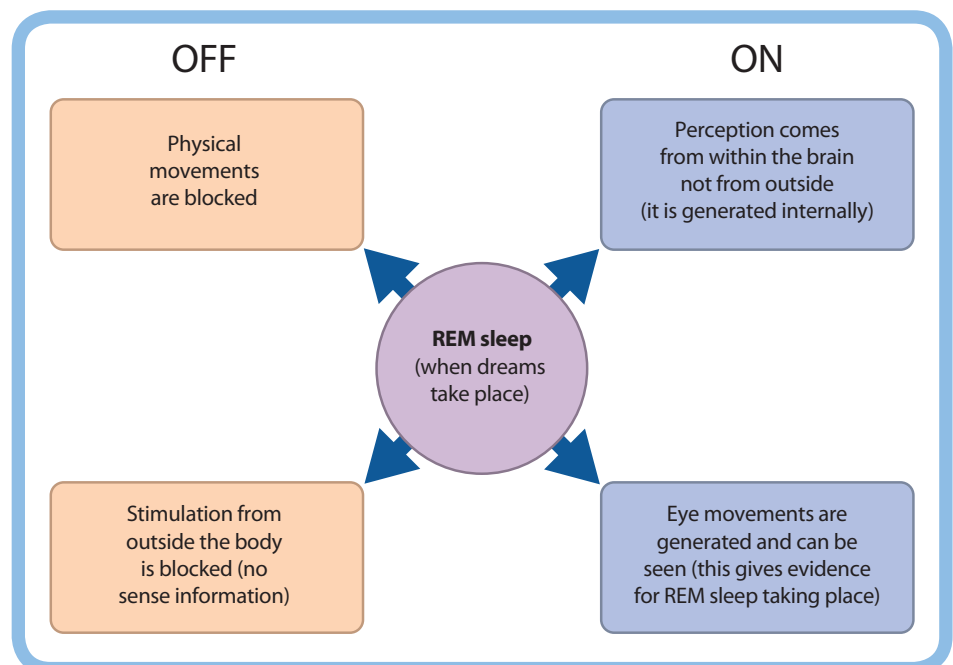


Figure 9.3 Diagram of the situation during sleep where the brain is a dream generator (according to the activation-synthesis model of dreaming)

Strengths and weaknesses of the activation-synthesis theory of dreaming

The evidence used to back Hobson and McCarley's (1977) theory is one of its strengths. When people are observed in a sleep lab, they all show rapid eye movement periodically during their night's sleep, but muscles are paralysed and sense data is not received. From this, it makes sense to conclude that dreaming comes from the brain generating and making sense of random information. There is evidence from other studies as well. McCarley and Hobson (1975) used cats to see which areas of the brain were active during REM sleep. They found activity in the pons and the reticular activating system – both structures are involved in shutting down physical movement during sleep.

Using animals to study brain function has the strength of being able to experiment in a way that cannot be done, for ethical reasons, using humans. However, there is the related weakness that animals are different from humans in important ways, so evidence from animals is not necessarily relevant or generalisable to human functioning.

A weakness of the concept of random thoughts is that, when reporting dreams, people can often link them to things that happened the day before. This suggests that the random firing of neurons during REM sleep has some meaning. Cynthia Rittenhouse, Robert Stickgold and J. Allan Hobson (1994) found that about 34 per cent of 200 dreams did not make logical sense. However, perhaps the dreamer tells the dream in a way that makes it make sense. It is interesting, though, that dreams do seem to have some meaning and this goes against the 1977 activation-synthesis theory of dreaming.

The fact that the 1977 theory was built on and amended could be considered a weakness as, on its own, it did not stand the test of time. Hobson (1999) suggested that there was meaning in dreams and also that some of the random firing of neurons could be useful as a source of good ideas. The fact that the model is still being investigated and used is a strength of the theory. Further investigations have led to a new theory – the AIM model, which looks at activation (A), input and output prevention (I) and modulation (M). Modulation refers to the neuron activation in the brain and memory or consciousness of the information activated.

Try it

Ask people about their dreams in a sensitive way. Try to find out how often someone can see something that happened the day before in their dream. This can test whether dreams come from making sense of random activation of neurons or whether the firing of neurons is not that random.

Link it up

An example of the difference between a human and an animal is discussed in Topic 10 *Language, thought and communication*.

Develop it

Carry out research to find out more about the problems with the activation-synthesis theory. For example, look at the discussion by G.W. Domhoff (2000) in *The Problems with Activation-Synthesis Theory*.

Studies

Freud (1909) Little Hans: Analysis of a Phobia in a Five-Year-Old Boy

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Key terms

Psychosexual stages:

Freud's (1905) theory of child development (the oral, anal, phallic, latent and genital stages).

Phallic stage: the third of Freud's stages during which the Oedipus complex is worked through.

Oedipus complex: part of Freud's phallic stage; a boy has unconscious feelings for his mother and hates his father, who he sees as a rival and fears will castrate him.

Background to the study

As a way to cure patients with mental health issues, Freud listened to them while they talked and analysed any underlying thoughts and wishes they held in their unconscious. One of his studies focused on Little Hans, whose parents logged his development from when he was 3 years old. Freud only met Little Hans a few times, but the boy was aware that Freud was studying him and sent messages to Freud through his parents.

Freud wanted to follow the development of a child to get evidence for his idea of there being **psychosexual stages** of development. According to Freud, children went through the **phallic stage** from about 3 to 5 years old. In this stage they developed gender behaviour, through identifying with their same-sex parent. It is in this stage that the **Oedipus complex** develops. A boy, for example, would feel strong feelings of hatred for his father for 'possessing' his mother, whom he wanted too. He would then feel strong emotions, wanting his father out of the way as a rival while fearing that his father will castrate him. The Oedipus complex can be resolved: the boy must identify with his father and try to 'become' him, allowing him to possess his mother without guilt.

Aims

Freud had two aims in his case study work. One aim was to help the individual; the other was to build evidence for his theory of how children develop. His study of Little Hans was an opportunity for him to read about a child's actual development with the intention of seeing his theory in practice.

Procedure

Freud studied Little Hans by gathering a lot of detailed information from the regular reports sent to him by the boy's parents. He also had some information directly from Little Hans. There was a lot to the study so just three features are focused on here. As well as studying Hans's dreams, Freud looked at Hans's phobia of horses, a main problem analysed in the study. Around the age of 5, Hans was afraid to go out of the house and was particularly frightened of horses. Freud analysed what Little Hans said and the reports about him, including his dreams, to find out what was in

Hans's unconscious that was causing the phobia. The idea was to reveal to Hans his own unconscious wishes and desires so the phobia could be cured. Freud used traditional psychoanalysis: he listened to what was said and dreamed, considered how these issues are symbols of hidden unconscious desires and then interpreted the symbols to uncover the desires. The analysis was done using Freud's ideas about how children develop.

Results

These results focus on the phobia of horses, two dreams and some of Freud's interpretations.

Hans's phobia of horses

Hans saw a lot of horses in the street and feared the horses would fall down, especially if they were pulling loaded carts. He had seen a horse do just that – it fell down and died in the street. Hans particularly did not like horses with black bits around the mouth. Freud thought the black bits might be Hans's father's moustache and that the horse could be a symbol for Hans's father. The fear of horses showed Hans's unconscious fear of his father because his father would be angry with Hans for wanting his mother (Oedipus complex). Hans's phobia was helped with imagination and role play. In his imagination, he moved his father into a different role, that of 'grandfather'. This would help Hans to rearrange his excessive anxiety that his father would castrate him as a rival for his mother's love.



Do you think Little Hans's phobia could have come from seeing an accident in the street involving a horse?

An early dream

Little Hans's father reported a dream Hans had when he was about 5 years old – he woke up in tears saying he thought his mother was gone and he had no mummy. Freud said this was a dream showing anxiety that his mother would leave. This links to the Oedipus complex in the phallic stage: Hans would fear his father taking his mother away. Unconscious wishes (in this case, to sexually possess his mother) would be repressed and would leak out into the dream.

The giraffe dream

Little Hans had a dream about giraffes. In the dream, there was a big giraffe in the room and a crumpled one. The big giraffe shouted out because Little Hans (in his dream) took the crumpled one away. Both Freud and Little Hans's father thought the big giraffe was a symbol for a penis but Hans denied this. Freud discussed the dream with Hans's father and they linked it to the fact that Little Hans liked to get into bed with his parents in the mornings – something Hans's father did not like. It was thought that the big giraffe was Hans's father and the crumpled giraffe was his mother. When the big giraffe shouted at Little Hans for taking the crumpled giraffe away, this was interpreted as showing that Little Hans wanted to take his mother away from his father. This was taken as evidence for the claim that a young boy has sexual feelings for his mother while fearing his father and feeling guilt.

Exam-style question

Little Hans acted out some role play and represented his father as his grandfather. Explain how this role play may help to reduce Hans's anxiety according to Freud's theory. **(3 marks)**

Exam tip

If asked to 'explain' something relating to a theory, (a) briefly outline the situation in the question, (b) relate the situation to the theory and (c) be sure to justify your answer using the theory.

Sleep and dreaming – Why do you need to sleep and dream?

Develop it

You might be interested to look up Herbert Graf, the boy who was Little Hans in the case study.

Conclusions

Freud used evidence from the Little Hans case study to support his theory that children develop in a series of psychosexual stages, the third of which is the phallic stage. His theory about the Oedipus complex in small boys was supported by the Little Hans study. Hans seemed to fear his father and wanted him to go away. He also wanted to keep his mother away from his father, keeping her for himself.

As for Hans's phobia of horses, Freud thought that the horse represented Hans's father and the fear showed the Oedipus complex in action.

Strengths and weaknesses of the study

A strength of the study is that Freud gathered a lot of in-depth and detailed information about the boy, not only from his parents but also, to an extent, from the boy himself. The detail gives a richness and validity to the data. Qualitative data is needed for psychoanalysis to take place, including what the patient or client says, their dreams and other incidents.

There is also strength in the way the study was carried out. The Little Hans study is very carefully documented. Freud added his own notes as well as making it clear what information was given to him and its source. In that way, he carried out the case study scientifically, keeping a reflective account, which is common practice in counselling today. He recognised that his own responses and ideas needed to be recorded as well as the data from the case itself.

A weakness is that Little Hans's parents knew about Freud's ideas, including the Oedipus complex. As a lot of information came from Hans's father, it might be that only the information that suited the complex was passed on, leading to bias. Although case studies have the strength of providing rich and detailed data, they are about unique individuals and are not generalisable, so a universal theory cannot be generated from them. This is a weakness when building a theory, as Freud was doing.

Another weakness is that there is a learning explanation to explain Hans's phobia. Little Hans did see a horse fall down and die so might have learned his fear from this real incident. From this, he could have generalised his feelings of anxiety and fear at the time to all horses, rather than just that one incident.

Link it up

Qualitative data and generalisability are discussed in Topic 11 *Research methods*.

Sum it up

The Little Hans case study, written up as a book, gives a great deal of detail and analysis, including Freud's own notes. It looks in a unique way at the development of one small boy and includes features of his life such as his dreams, emphasising its uniqueness. However, Hans's parents were followers of Freud's ideas and are likely to have offered data that suited those ideas. This was not a

controlled scientific study giving objective data relating to measurable concepts. The very strength of the study – its uniqueness and detail – is also a weakness of the study. It is used as evidence for a theory that was likely to be in the minds of the contributors before the study began. It could be said that Freud looked for evidence of the Oedipus complex, even if he did not do this deliberately.

Siffre (1975) Six Months Alone in a Cave

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the study.

Background to study

In 1962, Michel Siffre spent 63 days in a cave in France to see how his body clock reacted to being without normal time cues. He was interested in space travel and thought that astronauts might experience situations that could be replicated in a deep cave. This began a series of experiments to see the effects of living in the dark, focusing on the experience of time and other effects on the body and mind. In the 1962 study, he had stuck to around a 24-hour clock despite losing track of time, so his internal body clock seemed to be keeping him to a normal day. Siffre then asked other people to live underground. He studied them and found their sleep-wake cycle was around 48 hours, quite different from his. In 1972, Siffre wanted to replicate these studies and use experiments to monitor his physical and

mental functioning. NASA sponsored this study because the aim was to shed light on how living without daylight cues would affect bodily rhythms and how this could relate to space travel.

Aims

The aim was to see how people would get on when travelling through space, where they could be isolated and would not have zeitgebers such as daylight to set their biological clock. Siffre wanted to see what his 'natural' sleep-wake cycle was when deprived of external environmental cues. His previous work suggested a 48-hour clock, though he himself had 'run' to a 24-hour one. He wanted to see if he could replicate the 48-hour day pattern.

Procedure

Siffre went into Midnight Cave, Texas, USA, on 14 February 1972 and came out in September of the same year, spending more than 6 months without seeing daylight. He lived in a large chamber that was about 130 metres from the entrance of the cave, down a 30 metre vertical shaft. He had very little in the cave with him. He had a tent on a wooden platform, with a bed, a table and a chair. He had frozen food to eat and 780 gallons of water to sustain him. He undertook experiments while in the cave.



Michel Siffre's cave had lights, which were switched on by his above-ground team when he let them know he was awake, and off when he said he was going to sleep. What effect might the lights have had?

Sleep and dreaming – Why do you need to sleep and dream?

Apply it

Sol wondered why he was so well tuned to his lifestyle of becoming tired at night and waking refreshed in the morning. He felt the Earth's natural 24-hour cycle suited him very well and he wondered if others were as lucky. Explain to Sol how his biological rhythms are governed by external cues in his environment, rather than his natural body clock, and why he was comfortable with his daily cycle.

It was important that there was nothing to indicate time of day or even what day it was. The point was to remove zeitgebers in his environment so that his natural bodily rhythms could be found. He was living outside of time, without calendar, clocks, sun or moon.

Every time Siffre woke up and thought it was 'day', he phoned his team of researchers above ground to say he was awake and they put lights on before he began his daily experiments. He took his blood pressure and then went through memory and physical tests, recording his results. His exercise was riding on an exercise bicycle and he also did target practice with a pellet gun. He kept a diary of when he thought it was day and night. He called 'night' the period when he felt tired. When he was ready for sleep, the team of researchers above ground turned the lights off.

Results

Siffre was keen at the start of the study but became depressed and upset at his lack of freedom. He became desperate for companionship; this was demonstrated when he wanted to trap a mouse he could hear nearby, to end his loneliness.

His record player broke and his books were damaged by damp and he began to think about suicide. Clearly the effects of dark and loneliness were severe. He came out of the cave with worse eyesight and psychological problems. He realised that living in isolation as he had was not a success. During the stay, he had thoughts about abandoning the study and wanting to leave the cave immediately but he realised that this was not rational. During the study, he found that his short-term memory was affected. A similar effect was reported by astronauts when in space.

He did not get the 'days and nights' right. His periods of sleep-wake were longer than 24 hours. At first, his sleep-wake cycle was just longer than 24 hours. However, as the study went on, the cycles became very varied. His sleep-wake cycle could range from 18 hours to 52 hours. He had two periods where his sleep-wake cycle was 48 hours, which he was expecting from his studies of other people before 1972. At that point, he had 36 hours awake and 12 hours asleep but he could not tell the difference between these days and other days when the sleep-wake cycle was different.

Conclusions

Siffre's aim was to see what his 'natural' circadian rhythm was – his sleep-wake cycle. He found a lot of variation in the sleep-wake cycle when cues to daylight and time were missing. His aim was to see how space travellers would get on being isolated without cues to time of day. He concluded that the body clock might be manageable, if erratic. However, the period of isolation in a confined space was not manageable. Astronauts would need companionship. Siffre concluded that 'time' is not something humans work with and understand without external cues.

Develop it

You can find out more about Siffre's stay in Midnight Cave and his earlier work using the internet. You should also be able to find a video and an interview with Siffre.

Strengths and weaknesses of the study

A strength of the study is the amount of detail, both qualitative and quantitative, that was produced. Siffre kept a lot of data about his bodily and mental functioning, and was careful in how he carried out his experiments and logged his results. He produced a detailed record of his progress (or lack of it) during his stay away from external time cues.

It was a strength that the study was done over a long period. Siffre spent 6 months studying his biological rhythms and found no regularity in his sleep–wake cycle. If he had spent less time, he may have found a particular rhythm by chance.

The study was criticised because lights came on when Siffre woke up and went off when he went to sleep. They were strong lights and would affect his internal body clock, acting as cues. Czeisler et al. (1999) used 24 volunteers kept in lower-level artificial lighting, which was switched on and off over 20- and 28-hour cycles. They found their 'day' was close to 24 hours. This is a weakness of Siffre's study.

There is also the issue of this study's findings not being generalisable. This was a one-off case study, where Siffre had to deal with issues such as noise of mice,

damp, telephone connections to the research team and other such issues. These were all irritating for him at one stage or another. A case study is unique and it is hard to generalise findings, as Siffre generalised to an astronaut's situation.

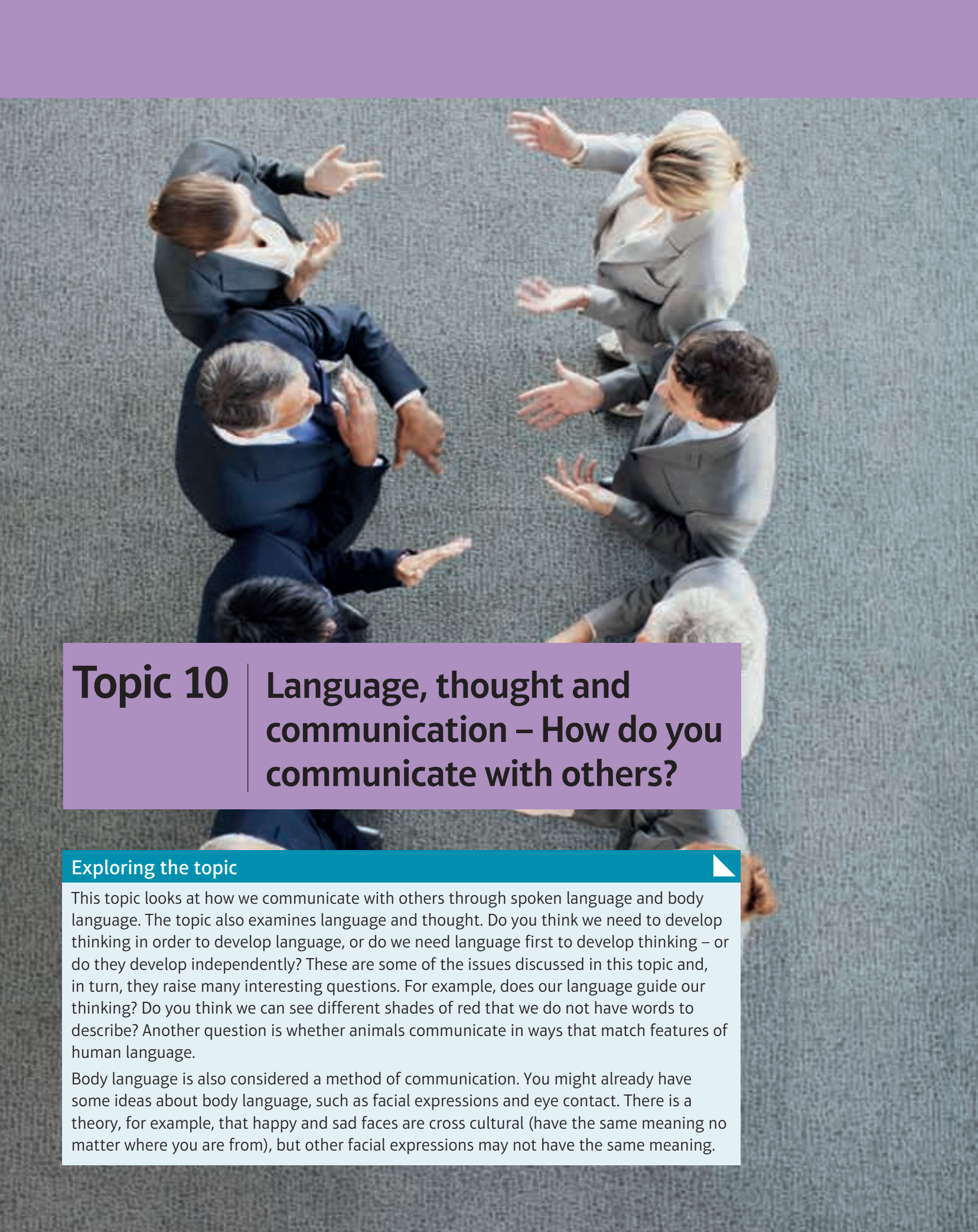
Sum it up

A difficulty with Siffre's study was that this was just one man in one study with the uniqueness of both the participant and the situation. It is hard to generalise from one study to say the findings are true of others, which means it was hard to draw conclusions about space travel from his findings. However, he gathered both qualitative and quantitative data, there was a lot of detail and there were controls in his study that made it experimental. These are strengths and the results are further strengthened by this being a long session spent in the cave, so a pattern might well have had chance to emerge. It is an interesting study giving useful data when data from other similar studies are added, however it put Siffre under a lot of stress and appeared to do harm, which suggests that it should not be repeated.

Psychology in action

It is useful to know about our sleep and wake patterns to help understand issues around a '24-hour society', including issues with shift work and jet lag. Knowing about our daily rhythms helps those who work without seeing daylight, showing the importance of light and dark. Siffre's study underlined difficulties astronauts might face regarding their body clock. It showed that there are biological effects of not having external cues to time. It also demonstrated the importance of company in space as being alone without such cues causes psychological effects.

Dreams can be disturbing, so it is useful to have some understanding of dreaming. Psychoanalysis, which can explain dreaming, is still used today to treat anxiety and phobias, and the biological explanation of dreaming is also valuable. Freud's ideas persist in counselling to this day.



Topic 10 | Language, thought and communication – How do you communicate with others?

Exploring the topic

This topic looks at how we communicate with others through spoken language and body language. The topic also examines language and thought. Do you think we need to develop thinking in order to develop language, or do we need language first to develop thinking – or do they develop independently? These are some of the issues discussed in this topic and, in turn, they raise many interesting questions. For example, does our language guide our thinking? Do you think we can see different shades of red that we do not have words to describe? Another question is whether animals communicate in ways that match features of human language.

Body language is also considered a method of communication. You might already have some ideas about body language, such as facial expressions and eye contact. There is a theory, for example, that happy and sad faces are cross cultural (have the same meaning no matter where you are from), but other facial expressions may not have the same meaning.

Your learning

In this topic you will learn about:

- the possible relationship between language and thought, including Piaget's (1950) and Vygotsky's (1981) theories, and the strengths and weaknesses of both
- how thought and language structures affect our view of the world, including linguistic relativism and linguistic determinism, and the strengths and weaknesses of both
- how communication differs in humans and animals, including Aitchison's (1983) criteria of language features
- examples of non-verbal communication: facial expressions, eye contact, body language, and personal space
- explanations of non-verbal communication, including Darwin's (1872) theory of evolution
- studies investigating language, thought and communication by Yuki et al. (2007) and Boroditsky (2001).

Getting started

To start off your investigation into language, thought and communication, try one of the following tasks:

- 1 If you study or enjoy art, or have a friend who does, consider the range of words you, or they, use to describe colour (see Figure 10.1) For example, you/they might say **aquamarine** or **cyan** instead of blue. Do you think people who understand these words actually see different colours from someone who only uses the word 'blue'? Can you think of another interest you have where you know a lot of words related to that interest that others might not understand or even perceive? Ask people what they think, giving them examples, and see if they can come up with examples of their own.
- 2 Working in a pair or small group, choose one person to use a closed posture, such as crossing their arms and leaning back. Find out what the others feel in the face of this. Do they feel welcomed? Then try using an open posture, such as open arms and feet apart, and see if this feels different.

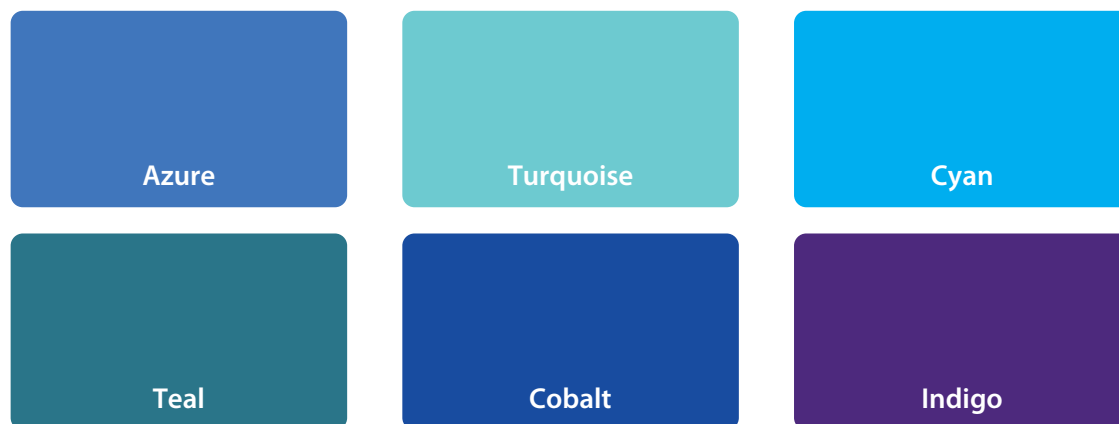


Figure 10.1 If someone sees many different shades of blue, they will see differences between the shades. However, would someone trying to identify a single shade of blue do that more successfully if they had words for the different shades?



Does an infant have to understand about objects in the world before they can use labels (words) for objects?

Key terms

Language: symbols (words or signs) that others understand and use to communicate.

Cognitive development: the way children develop their thinking abilities.

Representational thinking: thinking/mental processing about objects in the world.

Schema/schemata(s) (development): the world is represented in the mind using experiences and a schema is a mental representation. The plural of schema is 'schemata' though 'schemas' can also be used and is more common.

Link it up

Piaget's stages of development and schemas are discussed in Topic 1 *Development*.

The possible relationship between language and thought

What you will learn

- Piaget's view that language development is a part of our cognitive development.
- Vygotsky's idea that, early in our lives, thought and language develop separately as pre-linguistic thoughts and pre-intellectual language.
- The strengths and weaknesses of each explanation.

We can say **language** has to come before thought as we need a word for something in order to think about it. Alternatively, we can say thought has to come before language as we cannot learn to use words unless we can think about objects. A third way of looking at language and thinking is to say that at first they are separate and they come together as a child develops (Figure 10.2).

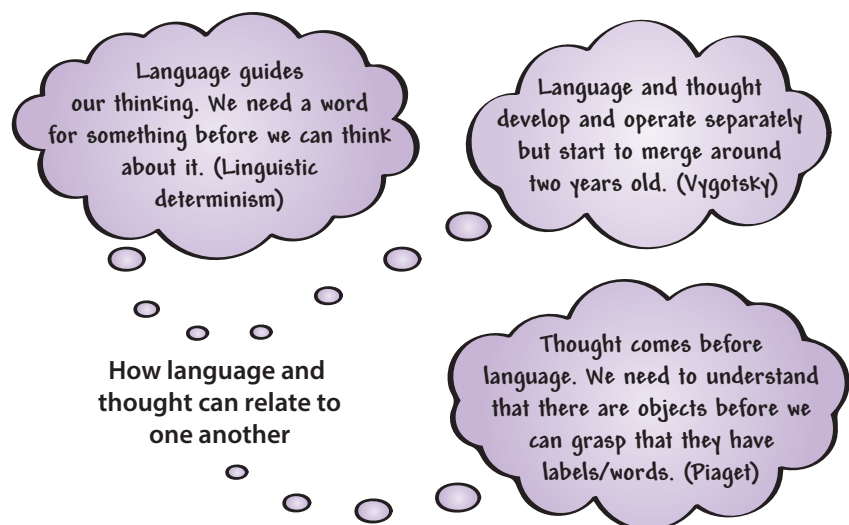


Figure 10.2 How do you think language and thought relate to one another?

Representational thinking precedes language

Jean Piaget (1950) put forward a theory of **cognitive development**, which explains that children's thinking develops in stages through building mental images of the world. **Representational thinking** is mental processing about objects as things in the world. The understanding of objects as 'things' in the world (representational thinking) comes before naming the objects (language).

Piaget's stages of cognitive development linked to language development

In the sensorimotor stage (birth to 2 years), the baby has inborn responses (reflexes) and begins to develop more complex movements and thinking. The infant develops **schemas** to make sense of the world, changing them as needed in order to build thinking. They also develop the understanding that there are objects in the world (representational thinking). For much of this stage the infant does not show language, suggesting that thought comes before language.

In the stage of pre-operational thinking (2–7 years), the child builds on their use of **mental imagery** and develops their use of **symbols** for objects. Symbols include using words for things – this is language. In this stage other symbols develop, such as symbolic play and the use of mental imagery, suggesting that language is just one use of symbols and that thinking goes beyond language use. Language is only one part of cognitive development in this stage. Piaget's first two stages show that thinking develops first, to include understanding that objects exist in the world. Then the child develops the use of words for objects, and language develops.

Strengths and weaknesses of Piaget's theory

A strength is that there is a practical application of Piaget's theory about language and thought. Piaget showed that a child is not a miniature adult, which can help parents and teachers understand that a child cannot do something that they are not yet ready to do. The way the child starts to develop language in the pre-operational stage and starts to use symbols in play and mental imagery is evidence that symbol use is not limited to language. This provides evidence for his claim that thinking develops first, and language comes as part of the development of thinking.

Some studies have shown that very young infants can imitate some adult actions (Shaun Gallagher and Andrew Meltzoff, 1996). Jane Lymer (2014) argues that she too has found self-awareness in babies. This suggests that self-awareness in infants can be seen as thought, coming before language, which supports Piaget's ideas.

However, Jones (2006), cited in Lymer, has argued that such imitated actions are actually reflexive and not done through self-awareness. This suggests that researching with very young children means there will be difficulties obtaining valid data. Difficulty in getting evidence for Piaget's views can be said to be a weakness of them.

Many other theorists and philosophers put forward the idea that language is not only involved in human thinking, but necessary for thinking. Peter Carruthers (2002) discussed the 'cognitive functions of language' and suggested that it is common sense that there must be language for thinking to occur. Piaget's ideas suit the very early stages of learning language, and so for a very young child thinking may come before thought, however, a criticism is that this does not cover all human thinking or all human language use.



Is a child using pretend play thinking or language or both?

Language and thinking are separate

Lev Vygotsky's theory explored an area of development that Piaget did not – the effect of social and cultural experiences on our development. Vygotsky's work, carried out in the 1920s and early 1930s, was translated in 1981, though it is worth noting that it was taught in British universities before that, and there were earlier translations, too. Vygotsky, like Piaget, saw children as active learners involved in their own development.

Pre-intellectual language

For Vygotsky, speech is social and children develop through talking with adults. At first, words are used to talk about objects and things to engage with others. This is **external language** (here, 'external' means 'social'). Vygotsky's theory includes social interactions. A young child's speech, for example, is about copying and does not involve thinking – it is **pre-intellectual language**. As development progresses, speech becomes more complex.

Key terms

Mental imagery: seeing and thinking without having real objects present.

Symbols: anything used to represent an object; a word, a thought or a picture can be a symbol.

External language: social language, used for interacting with others.

Pre-intellectual language: a child uses words, such as repeating a word or phrase, without underlying thought about the meaning.



Do you agree that it is when a child uses inner speech that thought and language come together?

Pre-linguistic thought

At first thought develops separately and is called **pre-linguistic thought**, meaning there is thinking but it does not involve language. A baby builds their understanding of the world. The baby, however, does not use language to do this. An example of pre-linguistic thought is when an infant throws food on the floor, seemingly a deliberate 'thoughtful' act.

Language and thought come together

Language and thought come together when speech is internalised – a child uses **inner speech**. This occurs when a child is 2–3 years old. Before this, language is the use of labels for things rather than thinking about things. During this time, a child has also developed their thinking and when they use inner speech, thought involves reasoning. **Egocentric speech** means objects and external things are used to help thinking, such as using one's fingers to count and the child might

Key terms

Pre-linguistic thought: a child's thinking and developing of ideas without using symbols such as words to organise thinking.

Inner speech: use of language internally when thinking.

Egocentric speech: use of external things or talking aloud to aid thinking.

talk aloud to themselves. When egocentric thinking is internalised it becomes inner speech.

Exam-style question

Bryn watches a baby trying hard to get one brick on top of another when playing. He also sees a 1-year-old girl holding out a toy to her mother and saying 'tatata'. Identify which of these is pre-linguistic thought and which is pre-intellectual language. **(1 mark)**

Exam tip

To learn difficult terms, you could 'translate' them into something more meaningful. For example, 'pre-linguistic' means 'before language' and 'pre-intellectual' means 'before thought', which might help.

Strengths and weaknesses of Vygotsky's theory

There is evidence for Vygotsky's ideas, which is a strength. For example, Adam Winsler and Jack Naglieri (2003) found that inner speech increases with age whereas external speech declines with age. Another strength is Vygotsky's focus on the importance of social interaction in a child's cognitive development, including the importance of learning about culture. It is useful to understand that a child develops within a culture and amongst people, rather than abstractly without such influences.

A weakness, however, is that Vygotsky wrote in Russian so we have to rely on translations of his ideas. During the translation, some ideas may have been missed or misinterpreted. René van der Veer (1987) suggests that the 1986 English translation of Vygotsky's book *Thought and Language* missed bits out. Van der Veer says that the editor of the 1986 version, Alex Kozulin, missed material that was in the final passage of the original 1934 text.

Another weakness is that Vygotsky's theory is not as testable as Piaget's because it is an outline of development rather than a thorough account. For example, Vygotsky did not show how the developmental stages that lead to a child being able to learn from socialisation might occur. However, Vygotsky's untimely death at the age of just 37 meant he did not have the time to develop his theory further, which leaves a certain level of ambiguity as to how his theory may have developed.

How thought and language structures affect our view of the world

What you will learn

- How language affects our views of the world: linguistic relativism.
- How language limits our views of the world: linguistic determinism.
- The strengths and weaknesses of these two ideas.

The way a language is structured might affect how we perceive things, and there is evidence that our language shapes our understanding and knowledge of the world. It seems that our world view is affected by the language we use.

Linguistic relativism

According to the concept of **linguistic relativism**, we see and interpret our world in the way that we do because languages split the world up differently. This is called the **Sapir-Whorf hypothesis** and was proposed by Roger Brown and Eric Lenneberg in 1954. Linguistic relativism is known as 'weak Whorf'. It is the suggestion that we tend to see the world in the way our language describes it, not that we can **only** see the world in that way (which would be **linguistic determinism**).

Evidence for linguistic relativity

Mandarin language and time

Lera Boroditsky (2001) found that language about time affects how time is perceived and thought about. She showed that thinking about time vertically, where 'up' means earlier in time and 'down' means later (as in Mandarin Chinese) affects the thinking of speakers of that language. Thinking about time horizontally, where 'before' and 'after', for example, are used, affects thinking about time for speakers of English and other such languages. Boroditsky (2001) found that English speakers set up to think horizontally rather than vertically were quicker to identify whether a statement about time (using 'before' and 'after' as well as 'earlier' and 'later') was true. The way a language talks about time is, therefore, evidence for linguistic relativity.

Link it up

Boroditsky's (2001) study is discussed in the *Studies* section. Read ahead to find out more.

The Hopi language and time

Benjamin Lee Whorf (1941) saw differences in how the Hopi (Native Americans) talk about time. He claimed the Hopi people had no word for 'time', and so had no concept of it. However, Ekkehart Malotki (1983) showed that this claim was too simplistic as he found that the Hopi did talk about time. This refutes Whorf's claim that the Hopi language is evidence for linguistic relativity.

Link it up

Perception and how we might see our world is discussed in Topic 8 *Perception*.

Key terms

Linguistic relativism: the idea that our language affects our view of the world.

Sapir-Whorf hypothesis: the way our language is structured affects our view of the world.

Linguistic determinism: the idea that our language limits our view of the world.

Link it up

The way words affect our recall is discussed in Topic 2 *Memory*. For an explanation of extraneous and confounding variables, see Topic 11 *Research methods*.

Key terms

Extraneous variables: variables that could affect the results of a study.

Confounding variables: variables that have not been controlled and have consequently affected results.

Using words 'fixes' our memories

Jonathan Schooler and Tonya Engstler-Schooler (1990) found that if someone sees a face and describes it in words, they are worse at recognising the face than if they had not described it. The words used in the description affected their recall. They also found that people who were asked to describe colours were not as good at remembering the colours as people who did not describe them. Nick Enfield (2015) refers to a woman mistakenly identifying someone as the man who attacked her, and suggests that such misidentification can come from the words used. The words affect our memory, suggesting that our perceptions are affected by language. This is evidence for linguistic relativity.

Apply it

Tammy carried out a study, asking one group of participants to name eight target colours they were shown. She then tested whether they could pick the colours out from a sheet of colours that included the target ones and other colours. Another group of participants did the same task but without naming the eight colours.

Explain three controls that Tammy should have used in her experiment to control **extraneous variables** (those that might affect the results) and avoid **confounding variables** (those that have not been controlled and have affected results).

Try it

Try the study Tammy carried out. Did using words to name the colours affect the perception of the participants? Were they less good or better at recognising the stimulus colours?

Enfield points out that using one word can save on mental processing. However, in some situations such economy can mean we stop noticing things. Colour is a good example. You might want 'green' for your bedroom wall. When you get to the shop to buy the paint you cannot picture the shade of green you want. This might be because the word 'green' applies to many different shades.

Psychology in action

Geoffrey Pullum (1991) explains how Whorf, who had experience as a fire officer, gave the example of a fire safety incident to show the importance of linguistic relativism. Someone might light a match near an empty petrol drum, causing an explosion. Perhaps they thought of 'empty' as meaning 'nothing in the drum'; however, there would be fumes, which would explode. People's understanding of their language may have 'caused' the explosion and this could be a defence if they were accused of negligence.

Strengths and weaknesses of linguistic relativism as a theory

This is not a trivial theory – Enfield (2015) emphasises the usefulness of knowing that our language can affect our thinking. For example, in court it would be useful to know that language use can affect memory.

A strength is that some experiments show that language has an effect on thinking, including Boroditsky's work on Mandarin speakers, English speakers and their different way of looking at time. These experiments used careful controls to isolate variables to measure, and so reliable conclusions can be drawn.

A weakness is the limited definition of language. In studies, 'language' refers to words and structures, such as time, rather than to people or events. Whorf and others focused on limited reality, which limits claims of linguistic relativity. For example, the effect of language on social interactions could be studied.

Another weakness is that it is very hard to study languages without using the language itself in the study. Whorf thought that the Hopi had no concept of time because they did not have a word for time. However, further analysis suggested that they did think about time. It is very hard to unpick a language to find the thinking behind it.

Exam-style question

Explain **one** strength and **one** weakness of linguistic relativity as a theory. (4 marks)

Exam tip

When giving strengths and weaknesses of a theory you could consider the evidence for that theory and how strong or weak the evidence is. This means looking at methods, for example experiments can give reliable conclusions (a strength) but tend to lack validity (a weakness).

Linguistic determinism

Linguistic determinism is the strong form ('strong Whorf') of linguistic relativity and means we can **only** see our world in the way our language splits it up. Our language limits our thinking so we cannot think in a way other than through language. Thought is not possible without language.

Discounting linguistic determinism

Linguistic determinism has largely been discounted because there is evidence that goes against it.

The Dani language

Boroditsky (2001) explains that the Dani language has just two words for colours. According to linguistic determinism, therefore, speakers of that language should only perceive two colours. However, in field studies of the Dani people in Papua New Guinea carried out by Eleanor Rosch (1970s), it was found that they were able to learn English words for colours. This suggests that Dani people could think about other colours, going against linguistic determinism.

Develop it

There is a lot of information about linguistic relativism and linguistic determinism on the internet. Look for examples of differences in languages that affect how people think. Look up research about colour in this respect.

Whorf did not put forward the idea of linguistic determinism

Boroditsky (2001) suggests that Whorf's 1956 view, that differences in languages lead to differences in perceiving the world, has been abandoned. However, Wouter Beek (2012) argues that Whorf never put forward the idea of linguistic determinism, just that of linguistic relativity – a soft form of linguistic determinism.

The myth about the Inuit and words for snow

Pinker (1995) suggests that the Inuit (first nation Canadians) do not have 400 words for snow, as has been suggested. Estimates vary, with some people saying there are only two words for snow in the Inuit language. The original claim was that, in English, we have 'snow' as the word for slushy snow, snow on the ground, driving snow and hard-packed snow, whereas the Inuit have different words for these types of snow. Whorf's idea is that a language with more 'snow' words means people 'see' differences in types of snow. What is not certain is that having more words for and about snow leads to different thinking about snow.

Try it

Generate a list of words representing objects, then ask people to write about each word, one at a time. Does one word generate different thinking and ideas from different people? If so, this suggests that language (one word) does not determine thinking (different ideas).

Strengths and weaknesses of linguistic determinism as a theory

A strength of the theory is its support of linguistic relativity, the weak version. The evidence that has shown language does not completely guide our thinking at least suggests there is some link between language and thought.

Another strength is that there is some evidence for linguistic determinism. For example, there is an experiment where a child watches two dolls put a marble in a box. One doll leaves the room and the experimenter moves the marble and puts it into a basket. The child is asked where the returning doll will look for the marble. Most children aged 4 to 5 years old understand that the returning doll will not know the marble has been moved so would expect the doll to search in the box. Candida Peterson and Michael Siegal (1995) used this method with deaf children. Deaf children with deaf parents fluent in American Sign Language (ASL) had no problem in saying the doll would look in the box. Deaf children with hearing parents gave the most incorrect answers. It was thought that the deaf children with hearing parents were not as exposed to ASL. This evidence was taken to mean that without language, the deaf children's thinking was affected.

A weakness is that people can think about concepts without having words for them, as illustrated by the Dani study. Also, if thought were not possible without language, how would language be learned? Piaget suggests that thought is necessary and language comes from thought, which is evidence against linguistic determinism in its strong form.

How communication is different in humans and animals

What you will learn

- Aitchison's (1983) criteria of language features.
- Similarities and differences between animal and human communication.

Communication is exchanging and understanding information and feelings. Language is a form of communication. Language is therefore a system using signals (such as gaze and sounds), symbols and rules to express thoughts and feelings.

Dolphins communicate with whistles and chirps. We do not understand their language but they do have one.

Ethics and researching with animals

Dolphins undergo stress when humans swim with them and try to touch them. Such interactions can disturb their natural behaviour, preventing them from resting and feeding. Experiments with animals are criticised because of animal suffering. Studying the communication systems of animals should be done with regard to **ethical issues**.

Key terms

Communication: passing on information and ideas (this can be through language).

Ethics: principles about how someone should behave relating to morality in a society.

Develop it

Look at the ethical issues raised by using animals when researching human behaviour.

Features of language

It is hard to talk about animals using language without knowing what characterises language. Jean Aitchison (1983) suggested four features that characterise human language.

- Semanticity – the use of words or symbols to represent objects or actions that are understood by others.
- Displacement – language must be able to discuss what is not present, that is, outside of current time and space.
- Structure dependence – the patterns and rules of language, such as using words and putting them in the right order. For example, 'the girl pats the dog' is not the same as 'the dog pats the girl' even though the words are the same.
- Productivity or creativity – being able to produce a new sentence or use words that someone else can understand. Someone is unlikely to say 'the mat sat on the cat', for example, but there is some sense of understanding from this novel sentence.

Animal communication

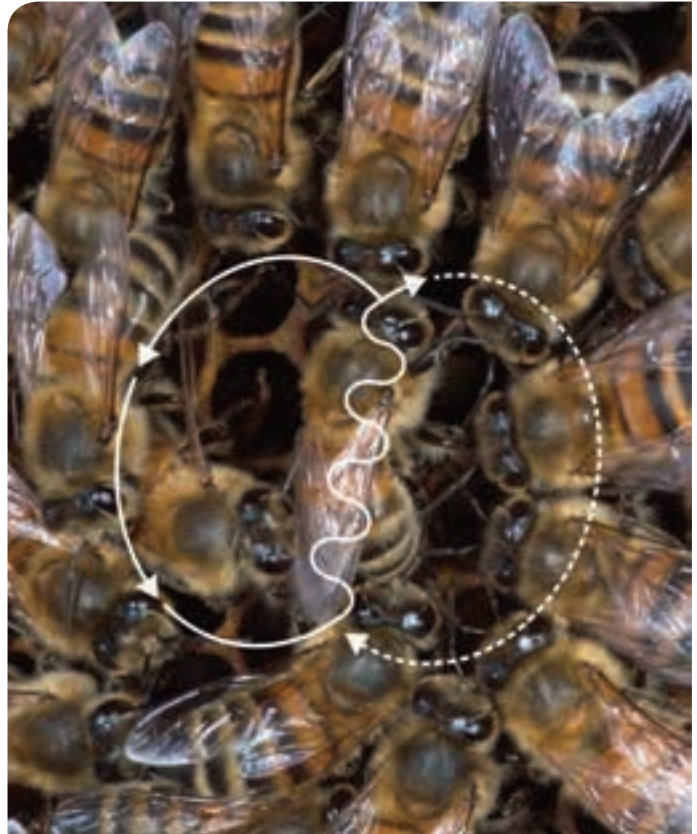
Animals can communicate in different ways. Communication is only called language if it satisfies Aitchison's (1983) four criteria of language features. Bees can signal distances from pollen by a dance (Karl von Frisch, 1950), vervet monkeys have special warning calls and ants use chemical signals. Animal communication, however, does not seem to enable 'talking' about something that is not in the here-and-now (displacement) or putting together a novel piece of communication that is understood (productivity/creativity).

Similarities and differences between animal and human communication

Humans are said to use language and animals are said to use communication, which already suggests similarities and differences between them.

Semanticity

Sue Savage-Rumbaugh (1998) claimed that Kanzi, a Bonobo chimpanzee, could use a keyboard with symbols on it to communicate as a 2-year-old child might communicate. However, Kanzi's abilities did



Bees communicate distance from pollen by doing a dance other bees can interpret. Would you say they are using language?



Meerkats stand guard and give alarm squeals to warn others in their group about danger. How far would you say their communication is like human language?



Do you think a chimpanzee is using language when it communicates via a keyboard?

not improve with age as a human child's language does. This is a difference in communication abilities between humans and animals.

The complexity of human language is what makes it different from animal communication. Animals do not need to discuss work or social activities. They do not have the means of thinking about themselves as part of a group, as humans do. Animals use signals, which can be reflexes. Humans can use signals as well; however, humans use symbols much more. Symbols 'mean' something to the person using them and the person receiving the message.

Displacement

Steven Pinker (1994) suggested that chimpanzees like Kanzi had learned to use a symbol on the keyboard in response to a question rather than having understanding of the question. However, according to Cooper and Kaye (2002), Kanzi could understand the instruction 'get an apple from upstairs' when there were other apples nearer, which shows understanding of objects not present. This is displacement.

Structure dependence

Animals seem to have a set of signals that others in their species understand. There is structure to their communication, such as a dog leaving a marker smell for other dogs to pick up on. Vervet monkeys use different calls to represent different situations. Other vervet monkeys understand these calls, showing that the calls have structure. However, the monkeys' calls resemble what they represent in some ways, such as a fearful, urgent sound representing fear. In human language, symbols often do not resemble what they represent. Also, animals do not have written language. There are therefore large differences in this feature of language.

Creativity/productivity

Human languages enable new sentences to be produced. Kanzi, limited by the keyboard, could not do that. However, to a very limited extent, Kanzi generated new ideas using his own combination of symbols such as 'chase hide' (to play a game) or 'food surprise' (on being asked what he wanted to eat). The creativity of human language is one of the differences between human and animal communication.

Differences in the brain and other physical features

Humans have Broca's area in the brain, which is used in speech. In other species, according to Preuss (2000), an equivalent area in the brain controls non-verbal mouth movements and arm movements. This is an important difference between animals and humans regarding language use. Animals and humans also have differences in the vocal areas. This limits sounds that apes and chimpanzees are able to make, despite being the closest to humans in terms of gene make-up (about 98 per cent of the DNA in our genes is the same as a chimpanzee's). The ability to use speech differentiates human and animal communication (Table 10.1).

Link it up

Broca's area is discussed in more detail in Topic 4 *The brain and neuropsychology*.

Vision	Sound	Smell	Touch	Heat
Gestures, e.g. chicks showing a begging response to get food	Alarm calls are common in animals, e.g. vervet monkeys	Animals use smell to detect a source of food; the smell is often chemical	Animals groom one another	Snakes can detect heat from prey

Table 10.1 Ways that animals communicate, using many senses, unlike human spoken language

Apply it

Asha watched a video of bees doing their waggle dance surrounded by the other bees in the hive. She wrote about the dance, calling her write-up 'the language of bees'.

Using Aitchison's features of language, explain why Asha called the bee dance a 'language' and why she might have called it 'communication'.

Develop it

Look up examples of animal communication and see how similar they are to human language. You could look at humpback whales or birds to see how their signals work. Use Aitchison's features of language in your assessment.

Exam-style question

Explain why Aitchison's creativity/productivity can be said to be an important feature of language.

(3 marks)

Exam tip

Some exam questions might ask you to apply your knowledge. You can answer by saying what the question is about (in this case, creativity/productivity and language), and then apply the idea as asked (in this case, why it is important). There might not be a right or a wrong answer, it is your thinking that is wanted, so justify your answer.

Examples of non-verbal communication

What you will learn

- Examples of non-verbal communication: facial expressions, eye contact, body language and personal space.

Non-verbal communication (NVC) refers to ways of sending messages that are not through verbal communication (words, speech and writing). Examples include facial expressions and use of eye contact, as well as the way we position our body (posture) and gestures. **Personal space**, the distance we like to maintain from others, is a way of using non-verbal communication, for example to repel threat. There are cultural differences in non-verbal communication, suggesting that it can arise from social norms, although some features of non-verbal communication seem to be universal.

Facial expressions

We communicate using our facial expressions, such as frowning when displeased or smiling to convey that all is well. Happiness, sadness, fear and anger are shown on the face in the same way across different cultures, suggesting that these universal expressions have **evolved** in humans and serve a purpose.

- Eyebrows help us to communicate – raised eyebrows show surprise; if they are lowered and pulled together, that shows anger.
- Eyes help, too. Wide eyes show surprise, crinkled eyes show happiness and staring tends to mean anger. Dilated pupils (larger pupils, giving more 'black' in the iris and less colour) can mean romantic interest in someone.
- The mouth is often used to understand emotions. An open mouth shows fear, an upturned mouth shows happiness and a downturned mouth indicates sadness. Covering the mouth suggests that you may be hiding something.

Eye contact

The amount of eye contact affects 'meaning', such as staring without blinking or blinking a lot. Blinking tends to increase when people like something or someone, and pupils also dilate. A steady gaze tends to mean someone is trustworthy whereas a lack of ability to hold someone's gaze is often seen as showing that the person is lying.

Aki Myllyneva and Jari Hietanen (2015), in experiments in Finland, found that people giving eye contact to a 'live face', believing that the person could see them, showed more arousal and brain responses than if the 'live face' was looking away. If a participant did not think the 'live face' could see them, for example if they believed there was something blocking the view, there was no difference in arousal and brain responses depending on whether the 'live face' was holding their gaze or looking away. This suggests that what someone is thinking affects how eye contact and such sensory information is received. Therefore, the amount and type of eye contact do not seem to be the only factors involved in how we are affected by eye contact as non-verbal communication.

Key terms

Non-verbal communication (NVC): communication using facial expressions, positioning of the body, gestures, eye contact and the way we speak.

Personal space: the space around us – we can feel uncomfortable if anyone we do not know well invades this space.

Evolved: characteristic passed down through our genes because it has survival value.

Link it up

Yuki et al.'s (2007) study is about how cultures use eyes and mouths to communicate emotions. It is discussed in the *Studies* section. Read ahead to find out more.

Try it

Do some research on non-verbal communication. On one side of a sheet of A4 paper draw three 'faces': one with an upturned 'smiley' mouth, one with a straight line mouth and one with a downturned 'sad' mouth. Draw the 'faces' without eyebrows and large enough so that eyebrows can be drawn in. Make some copies of your drawing. Ask people to fill in the eyebrows in all three 'faces'. You should find that the eyebrow shapes differ depending on the mouth position, for example higher eyebrows for the 'smiley' mouth.

Body language

Gestures

We can communicate by waving and pointing; these are called gestures. Some gestures have cultural meaning – we tend to roll our eyes to show disbelief. We nod towards somewhere if we are giving directions and we nod when we are encouraging someone to continue with their story. An air kiss might be a kiss we do not want to give, in some circumstances, or might indicate a fairly weak friendship. A hug is usually given if the friendship is stronger.

Postures

Defensive postures involve folding your arms across the chest or crossing your legs. Posture might show 'leakage', which is when someone is saying something but their posture contradicts it, such as someone reassuring another person while standing with their arms and legs crossed. A closed posture can mean sitting at an angle facing away from someone and can include crossed arms and legs. An open posture would be someone facing the other person directly with hands spread apart and perhaps they would be leaning forward. An open posture is seen as more welcoming, less defensive and friendlier – it is more positive. Mirroring (replicating someone's body language) is a way people relate to one another when they are interested in each other. For example, if one person turns their foot to the right, the other will do the same.

Key terms

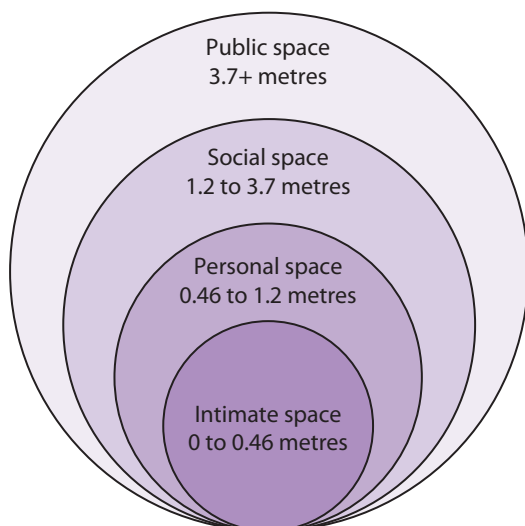
Proxemics: the study of distances that people set between themselves and others.

Interpersonal space: the space people are comfortable with between themselves and others, depending on their relationship.

Apply it

Abram was being interviewed for a job he really wanted. He was sitting opposite the interviewer, had crossed his arms and legs and was sitting back in the chair.

Using understanding of body language involving posture, explain what Abram could have done to improve his chance of getting the job.



Personal space and distance

Proxemics

Proxemics (Edward Hall, 1963) refers to the study of how we use space and how the amount of space we have around us affects our behaviour, social interactions and communication. Proxemics also includes the effects of culture on how we use space.

Interpersonal distances

Hall used four zones to show space issues between people in the Western world (**interpersonal space**) (Figure 10.3).

Figure 10.3 Hall suggested that space between people falls into four zones: intimate space, personal space, social space and public space

Key terms

Amygdala(e): the part of the brain for emotions; there are two amygdalae, one in each hemisphere/half of the brain.

Contact culture: a culture where physical touch, eye contact and close distances are used when interacting.

Link it up

The temporal lobes are discussed in Topic 4 *The brain and neuropsychology*.

Personal space includes the intimate and personal space in Hall's diagram; it refers to space we see as our own. If someone invades our personal space, it makes us feel uncomfortable, threatened, anxious and possibly angry. The intimate zone is just for very close 'others' while personal space extends to friends and people in someone's 'in group' – a group they belong to. Social distance is for people you do not know that well, including new acquaintances. Public distance is for the public, including audiences such as people attending a lecture.

Brain structure and personal space invasion

There is evidence to show that if someone invades the personal space of people without the **amygdalae**, the parts of the brain for emotions found in the temporal lobes, such people do not react negatively. This suggests that it is the amygdala that is activated when people react strongly to their personal space being invaded. This might be a survival technique – to stop others from getting too close by putting up a personal boundary.

Cultural differences in non-verbal communication

There are cultural variations in non-verbal communication.

- Beckoning – in some cultures, using a finger to say 'come here' is reserved for calling dogs and is offensive when used to beckon humans. Pointing one's finger can also be considered rude. Asians tend to use their whole hand when pointing.
- Looking someone in the eye is thought to show honesty in Western cultures. However, it can be rude in some cultures, such as Asian and Hispanic. Lack of eye contact in these cultures does not mean someone is not listening, as it might be interpreted in Western cultures.
- In Japan, nodding might just mean someone is listening – it might not signify agreement as it does in Western cultures. In other places, such as Iran, a thumbs up sign can be vulgar. The 'okay' signal of forming a circle between the thumb and the first finger can mean money or can be considered vulgar depending on the culture.

Cultural differences in personal space

Hall (1955) thought that cultural expectations affect the boundary of someone's personal space. In a crowded city such as Cairo, people might have to come very close to strangers and so people would not be offended by close proximity. In a country area, coming close would be less acceptable. Hall thought that distances were different in different cultures, though it is hard to find evidence for this. Michael Watson and Theodore Graves (1966) watched Arab and US students and observed that Arab students sat closer and used more eye contact. Watson (1970) talked about **contact cultures** that use closer distances, more touching and more eye contact. A problem with such studies is that they tended to use students at the same university. So students were in the same university culture as others even if they came from a different culture. Gary Evans, Stephen Lepore and Karen Allen (2000) found that different cultures did not react differently to crowding, and suggest that interpersonal distances are more similar between cultures than Hall originally thought.

Explanations of non-verbal communication

What you will learn

- Explanations of non-verbal communication, including Darwin's (1872) theory of evolution.

Some aspects of non-verbal communication may be universal and may have evolved in humans through **survival of the fittest**, an idea drawn from Charles Darwin's (1872) theory of evolution. Darwin was the first person to study body language both in humans and in animals.

Darwin's (1872) theory of evolution

Darwin was interested in facial expressions and other forms of body language. He considered how wide eyes indicate fear and bared teeth indicate anger. Darwin felt that these signals were useful to humans in the past and served specific purposes. Fear signals might put someone off attacking another. In an attack carried out by biting, the baring of the teeth would have signalled the attack. People no longer need to attack by biting, but the suggestion is that the behaviour remains because it assists communication. Baring teeth, for example, signals aggression. Such signals have survived for reasons that differ from their original purpose, but they remain because they serve a function that aids survival. This is Darwin's (1872) theory of evolution by means of natural selection.

It might be that non-verbal communication has a biological or social purpose that gives a survival advantage. This means that genes with the advantage are passed on through reproduction, leading to the survival of the fittest.

A biological explanation for facial expressions

Robert Zajonc (1985) put forward a theory that relates facial expressions to survival. The idea is that facial expressions of emotions affect blood flow in the brain.

Key term

Survival of the fittest: genes that aid human survival and enable reproduction are passed on as they are the most fitting or suitable for that particular environment.

This leads to the release of neurotransmitters, which in turn leads to emotional experiences. Facial expressions show emotional state, but not directly. A facial expression, either in response to the environment or formed for some other reason, gives a biological action to the brain. The emotional state triggers a biological action in the brain. For example, an expression of fear, through a biological action, produces an emotion of fear. The biological action might relate to survival, for example a fear response might trigger flight from a predator.

Link it up

Neurotransmitter functioning is explained in Topic 4 *The brain and neuropsychology*.

The social purpose of maintaining eye contact

There is also a theory that explains eye contact's purpose in communication (Lawrence Brunner, 1979). For example, someone has to maintain eye contact to check that the listener understands what is being said. Communication between people can therefore have a social purpose. Non-verbal communication, such as the use of eye contact, also serves to show honesty in verbal communication (Waciewicz and Żywicznyński, 2012). Living socially can be an evolved trait as it can aid survival.

The role of the environment

It is important to note that there are cultural influences from birth that affect our experiences, leading to some differences in non-verbal communication between cultures. This suggests that aspects of non-verbal communication are learned.

Studies

Yuki et al. (2007) Are the windows to the soul the same in the East and West?

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- The strengths and weaknesses of the study.

Background to the study

Masaki Yuki et al. (2007) suggest that different cultures use different parts of someone's face to understand their emotions. They discuss **collectivistic cultures**, such as Japan, where the good of society is seen as more important than the good of each individual. Emotions are not shown much in the face because it helps people to live and work together if they do not impose their feelings on others. This is not the same in Western cultures, where not showing one's emotions is seen as suppressing one's true self, so emotions are shown on the face. Yuki et al. thought that Japanese people may judge the emotions of others by using the area of the face where it is hardest to hide one's emotions, which is around the eye area rather than around the mouth.

Key term

Collectivistic culture: a culture that emphasises group membership, interdependence and cooperation.

Aims

To see if facial cues are used differently to interpret emotions depending on cultural background. To see if Japanese people judged emotions using cues from eyes and American people judged emotions using cues from the mouth.

Procedure

There are two studies: Study one is focused on here with Study two available online.

Participants included 33 male and 85 female Americans, and 72 male and 21 female (plus 2 with gender not given) Japanese; all participants were psychology students. They volunteered in exchange for course credits. After the study, there was a debrief and participants were thanked.

The hypothesis was that Americans would make more judgements about emotions using the 'mouth' cues of emoticons, whereas Japanese judgements would be affected more by eye cues of emoticons.

- Computer generated emoticons (Figure 10.4) were used, such as :) for a smile.
- Americans use :) for a happy face and :(for a sad face. Japanese use (^_^) for a happy face and (;_;) for a sad face. Note that for Americans the 'mouth' changes and for Japanese the 'eyes' change, which in itself supports Yuki et al.'s main hypothesis.

- Participants rated each computer-generated emoticon on a scale of 1 (extremely sad) to 9 (extremely happy).
- Results were analysed to see if the American participants rated emoticons as happier when the focus of 'happiness' was the mouth and to see whether Japanese participants rated emoticons as happier when the focus of 'happiness' was in the eye area.

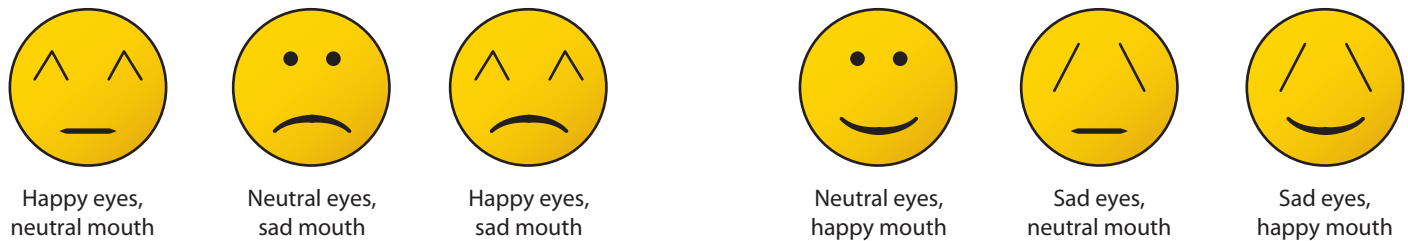


Figure 10.4 The six 'faces' used in Yuki et al.'s study

Results

There were cultural differences in ratings of the 'faces' on a happy–sad scale.

- Japanese students rated the emoticons as happier than the American students did when happiness was focused around the eyes. Americans rated emoticons as happier than the Japanese did where happiness was focused on the mouth.
- Japanese saw the happy eyes and neutral mouth emoticon as happier than the Americans did. The Americans saw the neutral eyes and happy mouth emoticon as happier than the Japanese did.

The results were in line with the hypotheses and the expectations.

Try it

You could draw some emoticons using happy, sad and neutral eyes and happy, sad and neutral mouths, making sure they are clear and large enough. Find some willing participants and ask them to rate each 'face' for happiness on the 1–9 scale used in the study. You are likely to be asking those in a Western culture, so it would be expected that the emoticons with the happy mouth are rated 'happier' than those with the happy eyes – that is your hypothesis.

Conclusions

Japanese students used differences in eyes to judge emotions. The Americans used mouth positions more than the Japanese did in their judgements. This supported the idea that different cultures use facial cues differently, particularly the eyes and the mouth. Cultures where emotions are required to be hidden use eye cues more to judge emotions. Cultures where it is culturally acceptable for the mouth to show emotions use mouth cues more.

Strengths and weaknesses of the study

A strength is in the use of controls, such as in the questionnaire making sure that all participants saw the same emoticons and had the same rating scale to use. If the study was to be done again, therefore, the same results should be found, giving reliability. Another strength is the study's practical applications. The findings would explain any perceived differences in emotions shown between Japanese and American cultures. Japanese people might be better at detecting when someone is lying as they would focus on the eyes and not the mouth. It would be useful for people to be aware of these sorts of differences when interacting with other cultures.

A weakness is that the 'faces' viewed had both eyes and mouth from which to judge emotions, so the focus was not on one or the other, even though analysis treated them separately. In reality, a smile includes eye changes, which was not taken into account, showing how experiments can lack validity. A further weakness is that Japanese and American psychology students were used in the study, so generalising to Eastern and Western cultures as a whole might not be justifiable and generalising beyond students could also be questioned (though perhaps being a student does not change how someone rates emotions).

Link it up

Experiments, validity, generalising and reliability are discussed more in Topic 11 *Research methods*.

Sum it up

Yuki et al. (2007) showed in their experiment that culture affected how facial cues were used to judge emotions. They found that the Japanese tend to look to the eyes to judge emotions, and they claimed that this is because in Japan people restrict how they display their emotions using the mouth. They found that American culture supported the idea of openness in using the mouth to display emotions, so American participants looked to the mouth to judge emotions. They only used psychology students, and this is likely to have limited the age range and life experiences of the participants. However, it can be argued that age and life experiences would not affect how cultural experiences affect our view of the world. They also only used two cultures, and perhaps these limitations mean we should not state that 'culture affects how we use body language' without more research. However, they used careful controls in their study and the findings showed reliability. It also has practical applications, as it is useful to know that not all cultures use non-verbal communication in the same way.

Boroditsky (2001) Does language shape thought? Mandarin and English speakers' conceptions of time

What you will learn

- Background to the study.
- Aims, procedures, results and conclusions.
- The strengths and weaknesses of the study.

Background to the study

The focus of Lera Boroditsky's (2001) study is how the language we speak affects how we think, which relates to linguistic determinism and linguistic relativity. English and Mandarin languages 'talk' differently about time. It is claimed in this study that this affects how speakers of those languages think about time.

Link it up

Look back at thought and language structures to remind yourself about linguistic determinism and linguistic relativism.

- English speakers think of time as 'past', 'present' and 'future', showing a direction that time moves in. They think of time as moving along a line; for example, they say people cannot 'go back' in time or they talk about good times 'ahead'. Boroditsky concludes that in English, time is viewed horizontally.
- Mandarin speakers talk about time as 'up' and 'down'. Early events are 'up' and later events are 'down'. The English language uses 'the meeting is coming up' and 'knowledge is handed down'; however, this is not done as often as it is in Mandarin. Mandarin Chinese talks about time vertically.

The question is whether the differences in the way English and Mandarin talk about time affect how speakers of those languages think about time.

Aims

The focus is on whether language affects how someone thinks about the world. The main aim was to see if setting someone up to think about things 'vertically' will mean that Mandarin speakers are quicker than native English speakers when answering 'true' or 'false' about time issues. Also, would English speakers be quicker when answering 'true' or 'false' about time issues if set up to think horizontally rather than vertically?

Procedure

Participants included 26 speakers with English as their first language (native English speakers) and 20 native Mandarin speakers (who also spoke English). They were all students at Stanford University.

Boroditsky uses the idea of **priming**, which means setting someone up to think in a certain way. She then carried out tests to see the effect of the priming.

Key term

Priming: being exposed to a certain stimulus will influence the way you respond to a different stimulus later.

- 'Horizontal' priming – for example, a scene of a black worm and a white worm presented horizontally with the black worm 'in front'. The scene statement says 'the black worm is ahead of the white worm' (Figure 10.5a). This was to set up horizontal thinking.
- 'Vertical' priming – for example, a scene of a white and a black ball presented with the black ball above the white one. The scene statement says 'the black ball is above the white ball' (Figure 10.5b). This was to set up vertical thinking.

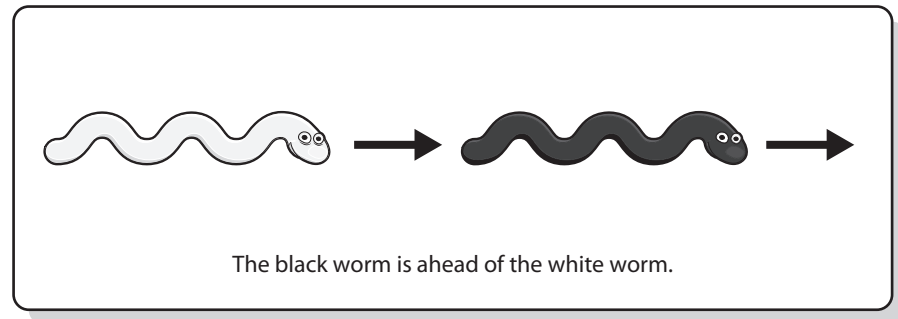


Figure 10.5 a) Horizontal priming

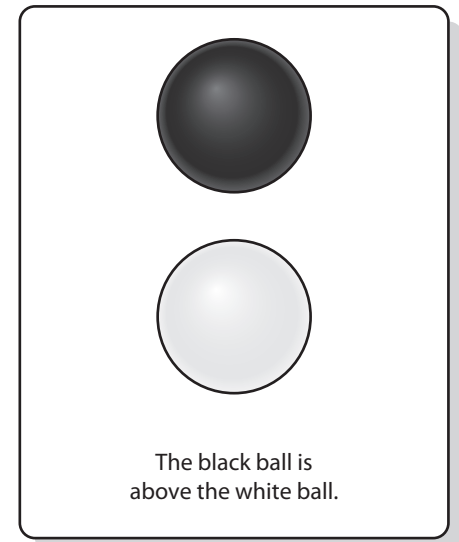


Figure 10.5 b) Vertical priming

Participants were shown single slides of scenes with the scene statements. For each slide, they were asked whether the statement was true or false.

Participants were also shown slides with a 'time' statement and asked if they were true or false, such as 'March comes before April'. All the statements asked about time were true. This was to see if being primed 'vertically' or 'horizontally' affected the time it takes to answer whether such a statement is true or false.

Link it up

Priming is an issue in perception. For more information, see Topic 8 *Perception*.

The slides were presented one at a time. There were also other slides, such as false statements about months/time, to mask the purpose of the study. The participant had to answer 'true' or 'false' as quickly as possible. The time taken to answer true or false was measured. The order of the slides was randomised.

All participants were tested in English. If the Mandarin speakers were still quicker when working in English and when 'vertically' primed, that suggests language does indeed guide our thinking.

- There were 128 priming scenes using a picture and a scene statement, with half showing horizontal relationships (as in the worm example) and half showing vertical relationships (as in the ball example). The priming statements used the phrases 'ahead of', 'behind' (horizontal), 'above' and 'below' (vertical) to give either horizontal or vertical priming. Priming scenes had questions about the scene statements, which were 'true' or 'false' and there were an equal number of each answer.
- There were 16 target statements about months of the year using 'before' and 'after', or 'earlier' and 'later', such as 'June comes before August'. All of these target statements were 'true'. 'Earlier' and 'later' were seen as more time-focused than 'before' and 'after', though both were used. There were 16 filler statements, all like the target statements and all about months, however, this time they were all 'false'.

Results

Reaction time to say 'true' or 'false' correctly was measured in milliseconds.

- Native English speakers were quicker to answer 'time' questions after horizontal primes (2128 milliseconds) rather than vertical primes (2300 milliseconds).
- There was no difference in the time it took Mandarin speakers to answer time questions. They took 2422 milliseconds after horizontal primes and 2428 milliseconds after vertical primes.
- However, there were differences regarding whether the time question used 'before' or 'after' or 'earlier or later', the latter being more time-related. Mandarin speakers answered 'earlier/later' time questions faster after vertical primes (2347 milliseconds) than after horizontal primes (2503 milliseconds).

Conclusions

Native English and native Mandarin speakers seem to think differently about time.

- English speakers were faster to answer statements about time after being horizontally primed than when vertically primed, showing language affects thought as English speakers use a horizontal view of time.
- Native Mandarin speakers were faster to answer statements about time (only if a question used more time-related wording such as 'earlier' and 'later', not 'before' or 'after') after vertical priming than after horizontal timing, also showing that language affects thought because Mandarin speakers have a vertical view of time.
- The findings were true for Mandarin speakers even when they were tested in English, which suggests that thought is affected by native language even if someone is thinking in a different language.

Overall conclusions

Two other experiments were done as part of the study (see the additional material on the website), adding to the results and the conclusions. These are briefly outlined here to extend the conclusions.

- One of the other experiments (Experiment two) showed that the age at which someone learns a language affects how strongly thinking is influenced by their language. Mandarin speakers learning English later used vertical thinking about time more than those who learned English early in their lives.
- Experiment three showed that training a native English speaker to talk about time in vertical terms means the English speaker gets results similar to a native Mandarin speaker. Learning to talk about a concept like time in a different way affects how that concept is thought about.
- All three experiments in the study showed that the way language 'talks' about time affects thinking about time.
- It has been shown that the colour words in a language do not prevent someone from perceiving different colours (in Dani language there are two 'colour' words but Dani speakers can learn about different colours). However, the way time is talked about does seem to affect how time is seen. These results are contradictory. Perhaps colour has more of a physical aspect than time. It could be that abstract concepts are more determined by language than easily seen objects and physical characteristics.

Exam-style question

Assess the conclusions of Boroditsky (2001) about the relationship between language and thought.

(9 marks)

Exam tip

To 'assess', you need to consider relevant issues, make a judgement and come to a conclusion. You have time to briefly write about the issues but avoid using too much description. Make sure you look at an issue (here, you could discuss the use of experiments), consider the pros and cons specific to the question and then decide the effect of the issue (such as whether using the experimental method affected the conclusions drawn).

Strengths and weaknesses of the study

A strength of using an experimental method is that variables are controlled. For example, randomising the order of the presentation of the slides. If the slides were in an order the participants might work out the trial structure and their responses could be affected accordingly. Controlling extraneous variables such as these strengthens conclusions.

The findings that the way a language talks about time affects how its users see time were supported by all three experiments used in the study. This strengthens the results and suggests they are reliable.

Boroditsky only studied time and did not consider other concepts, which could be considered reductionist. Using a reductionist approach means findings do not consider the whole picture, limiting the conclusions.

Often with experiments, generalisability is limited. The study used Stanford University students. There is a potential for bias here depending on the student's ability with language, thought or both. A further weakness is that the study does not represent real-life thinking – our thoughts are not usually primed in order for us to answer questions. So, the study lacks validity.

Link it up

Variables, reliability and generalisability are discussed in Topic 11 *Research methods*. Reductionism is discussed in Topic 2 *Memory*.

Sum it up

The findings of Boroditsky's (2001) study are interesting and are the result of carefully controlled experiments, suggesting that language can affect thinking. However, this cannot be applied to all thinking as it can be argued that language does not affect our understanding of more concrete concepts, such as colour.

Psychology in action

Humans learn language from a very young age to communicate with others both about their needs and for their pleasure. We learn the language of our culture and it is useful to know how cultural differences like language can affect us, including how we see our world. The Mandarin Chinese have language, writing and possibly thinking that is very different from English. However, such differences do not mean one culture is 'right' and one 'wrong', only that they think differently.

There can also be cultural differences in body language, which are useful to know about in order to smooth the course of interactions with others from different societies. In cultures that are different, training can be undertaken so that business can be done successfully with no offence given or taken. For example, when doing business in Japan it is useful to know that silence is valued and the Japanese are likely to rely on non-verbal cues, with their own ideas hidden from view.

Some aspects of non-verbal communication seem to be found in all cultures, such as how we display and understand emotions. This supports the idea of human characteristics arising through evolution and survival of the fittest.

Preparing for your exam 2

The Edexcel GCSE (9–1) Psychology consists of two externally examined papers. This section of the book has been designed to help you prepare for Paper 2.

Exam strategy

Research methods and maths skills

Throughout the exams, you will be tested on your knowledge of research methods and mathematical skills. Research methods are worth 20 per cent of your final mark, and are primarily assessed in Section A of Paper 2, but some methods questions appear in Paper 1 and other sections in Paper 2. Topic 11 *Research methods* may draw upon your understanding of the contexts of Topics 1–5 from Paper 1, in which research methods will be tested. You may also be asked to suggest improvements for existing or novel investigations.

There is an assessment of mathematical skills, worth 10 per cent of your final mark, in Section A of Paper 2. The maths skills tested are Key Stage 3 or above.

Paper 2 (1PS0/02)

Paper 2 is also divided into six sections: A–F. Section A examines your knowledge of research methods. You must answer **ALL** questions in section A.

The next five sections (B–F) cover the five optional topics, so you should **only** answer questions from **two** of these sections. Your teacher will choose which topics you will study. You should clearly indicate your topic choices at the beginning of Section B, where you can cross two boxes to indicate which questions you will be answering.

The exam is 1 hour and 20 minutes and is out of 79 marks. The paper is worth 45 per cent of your final mark.

The assessment in Section A is based on multiple-choice and short-answer questions worth between 1 and 4 marks each. For many of these, you will need to use a calculator, so you must bring along a scientific calculator in case it is needed, but remember to show all of your workings. There is also an extended-response question worth 12 marks at the end of this section (Table 1).

Sections B–F contain multiple-choice and short-answer questions and each has one extended-response question worth 9 marks.

Section A	Content	Question types
Do not forget your pencil and a ruler for graphs, a calculator and a black pen.	Topic 11 <i>Research methods</i> – <i>How do you carry out psychological research?</i> (Questions may be drawn from material from the compulsory Topics 1–5 examined in Paper 1.)	This section can include: <ul style="list-style-type: none">• calculation questions and diagrams• multiple-choice questions• short-answer questions (1–4 marks)• one 12-mark extended-response question• a total of approximately 37 marks for Section A.

Table 1 Structure of Section A

Preparing for your exam 2

Some question types and command words

Table 2 provides some more command words to consider. Others have been explored in the exam preparation section for Paper 1.

Command word	Skill
Draw	You may be asked to draw a table or graph in Paper 2. This should be done using a pencil, not a pen. You should also use a ruler for axes and certain types of graphs.
Calculate	You may be asked to complete calculations in Paper 2. Although you can use a calculator, you need to show all your workings of a sum. It may be better to only use the calculator to check your final answers. You are given additional marks for showing your workings, so please remember to write them down in the space provided.
Assess*	<p>The 'assess' command word is only used in extended-response questions. All of the 9-mark extended-response questions ask you to assess something you are given. There are a total of four assess questions: two at the end of Paper 1 and one at the end of each optional topic in Paper 2.</p> <p>These questions test all of the assessment objectives (AO1, AO2 and AO3), so require knowledge and understanding, application of knowledge and your ability to evaluate and give a reasoned conclusion.</p> <p>You are given a question context and will need to carefully consider what knowledge applies to the case. You must answer within the context of the question, assessing the relative weight of ideas drawn on in the question, and come to a reasoned conclusion. It is helpful to end your essay with 'In conclusion', so that you are reminded to provide one.</p>
Evaluate*	<p>This command word is reserved for the 12-mark essay on Paper 2 (Section A).</p> <p>'Evaluate' questions test all assessment objectives (AO1, AO2 and AO3) and require knowledge and understanding to be shown while drawing upon strengths, weaknesses and alternative ideas.</p> <p>'Evaluate' questions also demand a reasoned conclusion or judgement to be formed at the end of the essay.</p>
* All 'assess' and 'evaluate' questions test the quality of your written communication and are assessed according to a levels-based mark scheme. This is indicated by an * (asterisk) at the start of the question. This means that you should try to draft a plan and consider how you construct your answer.	

Table 2 Command words and how to tackle them

Sample questions and answers, Paper 2

1. Christine conducted a memory experiment and put her findings in Table 3.

Total number of digits recalled after learning while listening to music	Total number of digits recalled after learning in silence
6	10
4	11
5	14
7	9
6	12
4	13
6	10
7	10

Calculate the mean recall of the group who learned digits in silence.

You should give your answer to 2 decimal places. (2 marks)

Table 3

Exam tip

This type of question measures your ability to perform mathematical calculations. You need to calculate the mean of one set of data (one column). For calculation questions, remember to check

which dataset you are required to use, show all of your workings and check how the sum needs to be presented – in this case, to 2 decimal places.

Student answer

$$10 + 11 + 14 + 9 + 12 + 13 + 10 + 10 = \frac{89}{8} = 11.125 = 11.13 \text{ (2dp)}$$

Feedback/annotation

The answer shows the workings for calculating the mean score, by adding together the values of each score and dividing the sum by the total number of scores in the dataset. The answer then performs the operation of rounding to 2 decimal places.

Remember that we round up for 5 and above, and round down for 4 or below.

Verdict

This is a high-level response because:

- it shows all the workings of the calculation
- it has correctly identified the dataset that needs calculating
- it has presented the answer to the correct number of decimal places.

2. Virginia keeps having the same dream over and over again. She keeps dreaming of going to the park and feeding the ducks. During the dream, the largest duck on the pond quacks very loudly and flies at her. The large duck pecks her hand and takes all her bread. Virginia conducted some online research into dreaming and found a website that interpreted her dreams as having relationship issues with a parent.

*Assess how well dreamwork can account for Virginia's recurring dream. (9 marks)

Preparing for your exam 2

Exam tip

'Assess' questions require an answer to show knowledge and understanding of relevant psychological theory/research/concepts, application

of knowledge to the given scenario and judgements. The question assesses all three assessment objectives.

Student answer

Dreamwork is when the real meaning of a dream is disguised. Virginia found an interpretation of the real meaning of her dream online as having some basis in her relationship with a parent. The manifest content of a dream is what is remembered. For Virginia, this is the image of the duck attacking her, which is what she remembers.

Dreamwork would explain that this imagery represents some underlying wish or conflict associated with a parent. However, this interpretation is subjective, and dream analysts may interpret the duck image in many different ways. We cannot prove whether the interpretation is true because the duck is a representation of an unconscious issue that cannot be scientifically tested.

The latent content of the dream is related to an unconscious conflict. The nature of the unconscious is completely unfalsifiable and cannot be tested using the attacking duck imagery as evidence. It cannot be used to prove that she unconsciously believes she is in conflict with her parent.

However, Freud's case of Little Hans demonstrates a similar unconscious conflict that he wrote about as a case study, offering some evidence for the concept of dreamwork.

In conclusion, there seems to be little evidence for dreamwork as an explanation of Virginia's dream.

Feedback/annotation

This is a good answer. There is knowledge and understanding (AO1) of dreamwork, and a good use of the key terms 'manifest content', 'latent content' and 'unconscious' in the description. There are also good links made between the description and the context of the answer, which shows that the student has applied their knowledge (AO2).

There are three main evaluation points (AO3) made with good use of the key terms 'subjective' and 'unfalsifiable', which have been linked to the context of the answer. More could have been made of the final

evaluation point regarding the case study of Little Hans in terms of a counterargument, such as lack of generalisability.

The answer provides a brief conclusion that shows a basic reasoned argument. Again, more could be made of this by drawing together the reason for this statement.

Competing scientific arguments are made, but the lack of development in the last evaluation point and a missed opportunity to consider alternative explanations, such as Hobson and McCarley, means that the answer is at the top of a mid-level response.

Verdict

This is a good answer because it:

- demonstrates relevant knowledge and understanding of the theory
- applies knowledge to the context in a reasonably sustained way
- offers strengths and weaknesses of the theory and provides some evidence.

The answer could be improved by:

- sustaining the application of knowledge until the end
- offering some more evidence-based judgements
- developing the conclusion in a more reasoned way.

Preparing for your exam 2

3. Brian was a quiet, polite boy. His teachers and parents started noticing that Brian was beginning to display signs of aggression and was found starting fights with other boys at his school. His parents were concerned that playing fighting games on his games console was influencing Brian. His teachers observed Brian mimicking fighting actions in the playground and raised their concerns with his parents.

*Assess whether learning theories might explain Brian's aggressive behaviour. (9 marks)

Exam tip

In addition to meeting all three assessment objectives, you should clearly link your answer to the scenario. In this case, you should link relevant theories and research to Brian's aggression and his playing of aggressive video games. You

should give a balanced answer that examines both for and against arguments. An alternative explanation for Brian's aggression other than playing video games could be one argument against learning theories.

Student answer

Learning theories, like social learning theory, might be able to explain Brian's aggression because he is watching and playing aggressive fighting games. This is called observational learning. He might watch a fighting move and try to model this in the playground with his friends.

Social learning theory is supported by the study conducted by Bandura et al. They found that children exposed to aggressive role models were more likely to repeat the aggressive behaviour and copy aggression towards a Bobo doll.

Operant conditioning can also explain his aggression because he might be getting points and 'level ups' for winning fights in the game. This is rewarding aggressive behaviour, and he then repeats this in the playground with his friends.

Operant conditioning can explain a range of behaviours, and is a possible explanation for Brian's aggression. However, the theory ignores other influences on behaviour that can be better explained by biological influences, for example.

Feedback/annotation

This is a reasonable answer that clearly identifies relevant learning theories that can explain the change in Brian's behaviour. There is a good attempt to link the theories to the context given because the answer describes how Brian might experience reinforcement and witness aggression from the games he is playing. There is also some attempt to form judgements about whether the two theories described are useful in explaining Brian's behaviour.

However, this answer does not show any depth of knowledge regarding each theory. There is some understanding that social learning theory and operant conditioning as general concepts can be used, but the answer needs to address how these processes might occur and use key terminology.

There is also little development of the judgement points, which are stated rather than explained. An overall judgement is missing from the answer.

Verdict

The answer is reasonable as it shows:

- general knowledge and understanding of Social Learning Theory and operant conditioning
- an attempt to apply the theories to the context given in the scenario.

The answer could be improved by:

- adding depth and detail to the theory by explaining 'how' each theory could account for Brian's behaviour using key terms
- sustaining the application of knowledge throughout the answer, particularly in the judgement points
- explaining the judgement points fully
- forming an overall judgement in relation to the question asked.

Preparing for your exam 2

4. Piliavin et al. (1969) conducted a field experiment to test bystander behaviour. Models were positioned in a subway carriage to see if passengers on the train would help the model who fell over and lay on the floor of the carriage.

- The model was either black or white.
- The model dressed an average passenger with a guide stick or carrying a brown paper bag with a bottle in it.

Researchers were positioned around the carriage to observe the responses of different passengers, their locations and how long they took to help the model.

* Evaluate the use of field experiments to investigate human behaviour. (12 marks)

Student answer

Field experiments are experiments conducted in a natural environment. Piliavin et al. used a subway train, which is a natural environment for shoppers and commuters. Field experiments have an independent variable (IV), dependent variable (DV) and try to control extraneous variables. Piliavin used race and the appearance of the model as the IV and the recorded behaviours were response time and location and number of the passengers in the carriage. Piliavin was clever in using the subway carriage because it offered as much control as a laboratory in terms of the environment. This being said, the type of participants could not be controlled as they did not recruit participants, they were simply passengers who would normally take the train on that day at that specific time.

This means that the sample may not be representative because a random sampling method cannot be used. It is true that the findings would only apply to commuters who used the train. As people tend to keep themselves to themselves on trains, this may not reflect everyday helping behaviour, in a high street for example. However, as over 4500 passengers were essentially participants to Piliavin et al.'s research, there is a high degree of generalisability possible.

Field experiments are useful because natural, everyday behaviour can be examined. This was true of Piliavin's study because the commuters would have been reacting in a spontaneous way. However, field experiments sometimes do not inform participants that they are part of an investigation, which can raise ethical issues. Piliavin et al. can be criticised for not gaining consent from the passengers. However, had the researchers gained informed consent, it may have invalidated their results. If participants knew that they were part of a study, or that the aims were to investigate helping behaviour, it is likely that everyone would have responded quickly and helped the model, which may not reflect real-life behaviour.

Field experiments are conducted in an everyday situation and so tend not to be replicable because the conditions change from one day to the next. Saying this, Piliavin et al. managed to replicate their study because of the degree of control they had over the route of the train journey and because the times between the stops were naturally standardised.

In conclusion, field experiments that take care to consider how environments can be controlled can be considered to be as useful as laboratory experiments in establishing cause and effect. This is true of Piliavin's research, but not true of all field experiments.

Preparing for your exam 2

Feedback/annotation

This is a well-constructed essay that has all the assessment objectives covered.

A01: the student has managed to describe the field experiment well – the main elements of natural environment, IV, DV and issues with control are present.

A02: the answer relates each descriptive element of the answer to the context of Piliavin et al.'s study, drawing on specific procedural knowledge and detail. This is sustained throughout the answer.

A03: the strengths and weaknesses of a field experiment are clear, and also linked to Piliavin's research, with some counterargument to each. This shows that there are 'logical chains of reasoning' in the essay. The answer is rounded off nicely with a strong and developed conclusion. The conclusion is justified in terms of the context of the study.

This is a top-level response, but would have benefitted from some key methodological terms being explained fully.

Verdict

The answer is good because:

- it satisfies all assessment objectives
- it draws in knowledge of Piliavin et al.'s study throughout the answer
- there are clear strengths and weaknesses, with a well-formed conclusion.

The answer could be improved by:

- explaining key terms, such as 'replicable' and 'cause and effect'. While these are used in the correct context, they need to be fully explained to show knowledge and understanding.

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