AQA Psychology for A Level Year 2 Revision Guide 2nd Edition Knowledge Check answers

PLEASE NOTE: This document contains suggested model answers that would achieve a good mark if provided in an exam. They are designed to help guide and instruct you but should not be considered definitive or the only answers you could give.

Chapter 1 Approaches in Psychology

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1. The first systematic experimental attempt to study the mind by breaking up conscious awareness into basic structures of thoughts, images and sensations. Isolating the structure of consciousness in this way is called *structuralism*.

2. In 1879, Wundt opened the first experimental psychology lab with the aim of describing the nature of human consciousness (the 'mind'). He pioneered the method of introspection – the first attempt to study the mind by breaking up conscious awareness into basic structures of thoughts, images and sensations. Isolating the structure of consciousness in this way is called *structuralism*. The same standardised instructions were given to all participants so procedures could be repeated (replicated). For instance, participants were given a ticking metronome and they would report their thoughts, images and sensations, which were then recorded.

Wundt recorded the introspections within a controlled lab environment and all participants were tested in the same way. For this reason, Wundt's research can be considered a forerunner to the later scientific approaches in psychology that were to come. Other aspects of this research would be considered unscientific, however. Wundt relied on participants self-reporting their 'private' mental processes. Such data is subjective and participants may not have wanted to reveal some of the thoughts they were having. Participants would also not have had exactly the same thoughts every time, so establishing general principles would not have been possible (one of the key aims of science).

3. Watson (1913) argued that introspection was subjective, in that it varied from person to person. According to the behaviourist approach, 'scientific' psychology should only study phenomena that can be observed and measured. B.F. Skinner (1953) brought the language and rigour of the natural sciences into psychology. The behaviourists' focus on learning, and the use of carefully controlled lab studies, would dominate psychology for the next few decades.

Many claim that a scientific approach to the study of human thought and experience is not possible, nor is it desirable, as there are important differences between the subject matter of psychology and the natural sciences. Also, there are approaches in psychology that employ methods that are much less rigorous and controlled than the behaviourist approach – such as the humanistic and psychodynamic approaches which rely on more subjective methods such as case studies.

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1. Classical conditioning is a form of learning in which a neutral stimulus (e.g. bell) can come to elicit a new learned response (conditioned response, CR) through association.

2. Rats and pigeons were placed in specially designed cages (Skinner boxes). When a rat activated a lever (or a pigeon pecked a disc) it was *rewarded* with a food pellet. A desirable consequence led to behaviour being repeated. If pressing a lever meant an animal avoided an electric shock, the behaviour would also be repeated.

3. Positive reinforcement – receiving a reward when behaviour is performed – makes it more likely to be repeated. Thus a child could be encouraged to come at 9pm by being allowed to stay out until 10pm at the weekend if they do.

Negative reinforcement – when an animal or human produces behaviour that avoids something unpleasant. Before the child leaves the house they could be warned that if they are not in by 9pm, they will be grounded for the rest of the week.

4. The behaviourist approach is only concerned with studying behaviour that can be observed and measured. It is not concerned with mental processes of the mind. *Introspection* was rejected by behaviourists as its concepts were vague and difficult to measure. Behaviourists tried to maintain more control and objectivity within their research and relied on lab studies to achieve this. They also suggest that the processes that govern learning are the same in all species, so animals (e.g. rats, cats, dogs and pigeons) can replace humans as experimental subjects.

Pavlov introduced the concept of classical conditioning by training dogs to salivate at the sound of a bell. Pavlov showed how a neutral stimulus (bell) can come to elicit a new learned response (conditioned response) through association – by presenting the bell and food together on several occasions.

Skinner placed rats and pigeons in specially designed cages (Skinner boxes). When a rat activated a lever (or a pigeon pecked a disc) it was *rewarded* with a food pellet. A desirable consequence led to behaviour being repeated. If pressing a lever meant an animal avoided an electric shock, the behaviour would also be repeated. This is operant conditioning – behaviour is shaped and maintained by its consequences.

One strength of behaviourism is that it uses well-controlled research. The approach has focused on the careful measurement of observable behaviour within controlled lab settings. Behaviourists have broken behaviour down into stimulus–response units and studied causal relationships. This suggests that behaviourist experiments have scientific credibility.

However, this approach may oversimplify learning and ignore important influences on behaviour (e.g. thought). Other approaches (e.g. social learning and cognitive) incorporate mental processes. This suggests learning is more complex than just what we can observe.

Another strength is behaviourist laws of learning have real-world application. The principles of conditioning have been applied to a broad range of real-world behaviours and problems. Token economy systems reward appropriate behaviour with tokens that are exchanged for privileges (operant conditioning). These are successfully used in prisons and psychiatric wards. This increases the value of the behaviourist approach because it has widespread application.

One limitation is behaviourism is a form of environmental determinism. The approach sees all behaviour as determined by past experiences that have been conditioned and ignores any influence that free will may have on behaviour. Skinner suggested that free will was an illusion. When something happens we may think, 'I made the decision to do that' but our past conditioning

determined the outcome. This is an extreme position and ignores the influence of conscious decision-making processes on behaviour (as suggested by the cognitive approach).

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1. Children are more likely to imitate the behaviour of people with whom they identify. Such role models are similar to the observer, tend to be attractive and have high status. For instance, a little boy may identify with Justin Bieber because of his popularity, attractiveness and boundless talent.

2. In a controlled observation, children watched either: an adult behaving aggressively towards a Bobo doll; or an adult behaving non-aggressively towards a Bobo doll. When given their own doll to play with, the children who had seen aggression were much more aggressive towards the doll. This suggests that children may learn aggressive behaviour through observation and imitation of adult role models.

3. To learn to bake a cake a child must first pay attention to the actions of its mother. The child must store the sequence of events in memory (retention) – the ingredients, lining the cake tin, etc. The child must be capable of reproducing the behaviour – they must have access to the correct utensils and be physically capable of imitating the actions. Finally, the child must be motivated to reproduce the behaviour. They may have observed cake-making behaviour being rewarded in the past – such as the look on their mum's happy face when tucking into what she has made (vicarious reinforcement).

4. Bandura agreed with the behaviourist approach that learning occurs through experience. However, he also proposed that learning takes place in a social context through *observation* and *imitation* of others' behaviour. Children (and adults) observe other people's behaviour and take note of its consequences. Behaviour that is seen to be rewarded (reinforced) is much more likely to be copied than behaviour that is punished. Bandura called this *vicarious reinforcement*.

Mediational (cognitive) processes play a crucial role in learning. There are four mediational processes in learning:
1. Attention – whether behaviour is noticed.
2. Retention – whether behaviour is remembered.
3. Motor reproduction – being able to do it.
4. Motivation – the will to perform the behaviour.

The first two processes relate to the learning of behaviour, the last two relate to the performance of behaviour (so, unlike behaviourism, learning and performance do not have to occur together).

Finally, *identification* with role models is also important. Children are more likely to imitate the behaviour of people with whom they identify. Such role models are similar to the observer, tend to be attractive and have high status.

One strength is SLT emphasises the importance of cognitive factors. Neither classical conditioning nor operant conditioning can offer a comprehensive account of human learning on their own because cognitive factors are omitted. Humans and animals store information about the behaviour of others and use this to make judgements about when it is appropriate to perform certain actions. This shows that SLT provides a more complete explanation of human learning than the behaviourist approach by recognising the role of mediational processes.

However, recent research suggests that observational learning is controlled by mirror neurons in the brain, which allow us to empathise with and imitate other people. This suggests that SLT may make too little reference to the influence of biological factors on social learning.

One limitation is SLT relies too heavily on evidence from contrived lab studies. Many of Bandura's ideas were developed through observation of children's behaviour in lab settings and this raises the problem of demand characteristics. The main purpose of a Bobo doll is to hit it. So, the children in those studies may have been behaving as they thought was expected. Thus, the research may tell us little about how children actually learn aggression in everyday life.

Another strength is SLT has real-world application. Social learning principles can account for how children learn from other people around them, as well as through the media, and this can explain how cultural norms are transmitted. This has proved useful in understanding a range of behaviours such as how children come to understand their gender role by imitating role models in the media. This increases the value of SLT as it can account for real-world behaviour.

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1. Schema are packages of information developed through experience. They act as a 'mental framework' for the interpretation of incoming information received by the cognitive system. Babies are born with simple motor schema for innate behaviours such as sucking and grasping, but as we get older, our schema become more sophisticated.

2. A theoretical model is a sequence of boxes and arrows, often represented as a flow diagram, which represents the passage of information through the cognitive system. The information processing approach suggests that information flows through a sequence of stages that include input, storage and retrieval, as in the *multi-store model of memory*. This model shows how sensory information is registered, then passed through STM and LTM where it is retained unless forgotten.

3. Cognitive neuroscience is the scientific study of the influence of brain structures (*neuro*) on mental processes (*cognition*). With advances in brain-scanning technology in the last twenty years, scientists have been able to describe the neurological basis of mental processing. This involves pinpointing those brain areas/structures that control particular cognitive processes. This includes research in memory that has linked *episodic* and *semantic memories* to opposite sides of the prefrontal cortex in the brain. Scanning techniques have also proven useful in establishing the neurological basis of some disorders, e.g. the *parahippocampal gyrus* and OCD.

4. In direct contrast to the behaviourist approach, the cognitive approach argues that mental processes should be studied, e.g. studying perception and memory. Mental processes are 'private' and cannot be observed, so cognitive psychologists study them indirectly by making inferences (assumptions) about what is going on inside people's heads on the basis of their behaviour. Cognitive psychologists emphasise the importance of schema: packages of information developed through experience which act as a 'mental framework' for the interpretation of incoming information received by the cognitive system.

One strength is the cognitive approach uses scientific and objective methods. Cognitive psychologists have always employed controlled and rigorous methods of study, e.g. lab studies, in order to infer cognitive processes at work. In addition the two fields of biology and cognitive psychology come together (cognitive neuroscience) to enhance the scientific basis of study. This means that the study of the mind has established a credible, scientific basis.

However, the use of inference means cognitive psychology can occasionally be too abstract and theoretical. Also, research often uses artificial stimuli (such as word lists). Therefore, research on cognitive processes may lack external validity and may not represent everyday experience.

5. In direct contrast to the behaviourist approach, the cognitive approach argues that mental processes should be studied, e.g. studying perception and memory. Mental processes are 'private' and cannot be observed, so cognitive psychologists study them indirectly by making inferences (assumptions) about what is going on inside people's heads on the basis of their behaviour. Cognitive psychologists emphasise the importance of schema: packages of information developed through experience which act as a 'mental framework' for the interpretation of incoming information received by the cognitive system.

Theoretical models are used to describe and explain how 'unseen' cognitive processes work. The information processing model suggests that information flows through the cognitive system in a sequence of stages that include input, storage and retrieval, as in the *multi-store model* of memory. The 'computer analogy' suggests similarities in how computers and human minds process information. For instance, the use of a central processor (the brain), changing of information into a useable code and the use of 'stores' to hold information.

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Another strength of the approach is the application to everyday life. The cognitive approach is dominant in psychology today and has been applied to a wide range of practical and theoretical contexts. For instance, artificial intelligence (AI) and the development of robots, the treatment of depression and improving eyewitness testimony. This supports the value of the cognitive approach.

One limitation is that the approach is based on machine reductionism. Although there are similarities between the operations of the human mind and computers (inputs-outputs, central processor, storage systems), the computer analogy has been criticised. For instance, emotion and motivation have been shown to influence accuracy of recall, e.g. in eyewitness accounts. These factors are not considered within the computer analogy. This suggests that machine reductionism may weaken the validity of the cognitive approach.

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1. The mind and body are one and the same. From the biological approach, the mind lives in the brain – meaning that all thoughts, feelings and behaviour ultimately have a physical basis. This is in contrast to the cognitive approach, which sees the mind as separate from the brain.

Behaviour has a neurochemical and genetic basis. Neurochemistry explains behaviour, for example low levels of serotonin in OCD. Psychological characteristics (e.g. intelligence) are inherited in the same way as physical characteristics (e.g. height).

2. A person's genotype is their actual genetic make-up. Phenotype is the way that genes are expressed through physical, behavioural and psychological characteristics. The expression of genotype (phenotype) is influenced by environmental factors. For example, PKU is a genetic disorder (genotype), the effects of which can be prevented by a restricted diet (phenotype).

3. Any genetically determined behaviour that enhances survival and reproduction will be passed on to future generations. Such genes are described as adaptive and give the possessor and their offspring advantages. For instance, attachment behaviours in newborns promote survival and are therefore adaptive and naturally selected.

4. According to the biological approach, everything psychological is at first biological. If we want to fully understand human behaviour we must look to biological structures and processes within the body, such as genes and neurochemistry.

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Twin studies are used to investigate the genetic basis of behaviour. Concordance rates between twins are calculated – the extent to which twins share the same characteristic. Higher concordance rates among identical (monozygotic, MZ) twins than non-identical (dizygotic, DZ) twins is evidence of a genetic basis.

One strength of the biological approach is its real-world application. Understanding of neurochemical processes in the brain has led to the use of psychoactive drugs to treat serious mental disorders. For example, drugs that treat clinical depression increase levels of the neurotransmitter serotonin at the synapse and reduce depressive symptoms. This means that people with depression are able to manage their condition and live a relatively normal life, rather than being confined to hospital.

However, antidepressant drugs do not work for everyone. Cipriani *et al*. (2018) compared 21 antidepressant drugs and found wide variations in their effectiveness. This challenges the value of the biological approach as it suggests that brain chemistry alone may not account for all cases of depression.

Another strength is the biological approach uses scientific methods. In order to investigate both genetic and neurochemical factors, the biological approach makes use of a range of precise and objective methods. These include scanning techniques (e.g. fMRI), which assess biological processes in ways that are not open to bias. This means that the biological approach is based on objective and reliable data.

One limitation is that biological explanations are determinist. Biological explanations tend to be determinist in that they see human behaviour as governed by internal, genetic causes over which we have no control. However, the way genotype is expressed (phenotype) is heavily influenced by the environment. Not even genetically identical twins look and think exactly the same. This suggests that the biological view is too simplistic and ignores the mediating effects of the environment.

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1. The unconscious mind is a vast storehouse of biological drives and instincts that have been repressed during childhood. The psychodynamic approach explains all behaviour as determined by unconscious conflicts over which we have no control. Even something as apparently random as a 'slip of the tongue' is driven by unconscious forces and has deep symbolic meaning – so mistakenly describing our partner's new dress as 'fattening' rather than 'flattering' may reveal our true feelings!

2. Defence mechanisms are used by the Ego to keep the Id 'in check' and reduce anxiety. *Denial* is when we refuse to acknowledge reality so someone may continue to turn up for work even though they have lost their job.

3. The oral stage occurs from 0 to 1 years and the focus of pleasure is the mouth; the mother's breast is the object of desire.

4. The psychodynamic approach suggests that the unconscious mind has an important influence on behaviour. Freud proposed that the mind is made up of the conscious mind – what we are aware of at any one time; the preconscious mind – we may become aware of thoughts through dreams and 'slips of the tongue'; the unconscious mind – a vast storehouse of biological drives and instincts that influence our behaviour.

Freud also introduced the tripartite structure of personality and claimed that the dynamic interaction between the three parts determines behaviour. The Id is the primitive part of the personality which operates on the pleasure principle and demands instant gratification. The Ego works on the reality principle and is the mediator between the Id and Superego. Finally, the Superego is our internalised sense of right and wrong. It is based on the morality principle and punishes the ego through guilt for wrongdoing.

Freud proposed five psychosexual stages that determine adult personality. Each stage is marked by a different conflict that the child must resolve to move on to the next. Any conflict that is unresolved leads to fixation where the child becomes 'stuck' and carries behaviours associated with that stage through to adult life. For instance, the Oedipus complex is an important psychosexual conflict occurring at the phallic stage which influences gender role and the formation of moral values.

One strength of the psychodynamic approach is it introduced psychotherapy. Freud's psychoanalysis was the first attempt to treat mental disorders psychologically rather than physically. Psychoanalysis claims to help clients deal with everyday problems by providing access to their unconscious, employing techniques such as dream analysis. Therefore psychoanalysis is the forerunner to many modern-day 'talking therapies' (e.g. counselling). The humanistic approach also introduced a form of talking therapy (client-centred therapy), but unlike psychoanalysis, it deals with the concrete problems of everyday life rather than unconscious conflicts.

Although psychoanalysis is claimed successful for clients with mild neuroses, it is inappropriate, even harmful, for more serious mental disorders (such as schizophrenia). Therefore Freudian therapy (and theory) may not apply to mental disorders where a client has lost touch with reality.

Another strength is the psychodynamic approach has explanatory power. Freud's theory is controversial and often bizarre, but it has had huge influence on Western contemporary

thought. It has been used to explain a wide range of behaviours (moral, mental disorders) and drew attention to the influence of childhood on adult personality. This suggests that, overall, the psychodynamic approach has had a positive influence on psychology and modern-day thinking. This contrasts with the humanistic approach which has been described as a loose set of abstract concepts and has had limited application in psychology and society as a whole.

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1. A parent who sets boundaries on their love for their child (conditions of worth) by claiming 'I will only love you if...' is storing up psychological problems – related to their sense of self-worth – for that child in future. For instance, a father may say to his teenage daughter, 'I will only love you if you stop seeing that boy'.

2. Self-actualisation refers to the innate tendency that each of us has to want to achieve our full potential and become the best we can possibly be. In Maslow's hierarchy of needs the four lower levels (deficiency needs) must be met before the individual can work towards self-actualisation – a growth need.

However, the concept of self-actualisation is a vague, abstract idea that is difficult to test – what exactly is someone's potential? This means that the humanistic approach, and the concept of self-actualisation, lacks empirical evidence to support it.

3. In Maslow's hierarchy of needs the four lower levels (deficiency needs such as food, water and safety) must be met before the individual (baby, child or adult) can work towards self-actualisation – a growth need. Self-actualisation refers to the innate tendency that each of us has to want to achieve our full potential and become the best we can possibly be.

One strength is that Maslow's hierarchy is anti-reductionist. Humanistic psychologists reject any attempt to break up behaviour and experience into smaller components. They advocate holism – the idea that subjective experience can only be understood by considering the whole person (their relationships, past, present and future, etc.). This approach may have more validity than its alternatives by considering meaningful human behaviour within its real-world context.

4. In Maslow's hierarchy of needs the four lower levels (deficiency needs such as food, water and safety) must be met before the individual (baby, child or adult) can work towards self-actualisation – a growth need. Self-actualisation refers to the innate tendency that each of us has to want to achieve our full potential and become the best we can possibly be.

One strength is that Maslow's hierarchy is anti-reductionist. Humanistic psychologists reject any attempt to break up behaviour and experience into smaller components. The hierarchy suggests there are multiple needs that must be met before humans can meet their potential. This approach has validity as it considers meaningful human behaviour within its real-world context.

However, humanistic psychology has relatively few concepts that can be reduced to single variables and measured and this applies to Maslow's hierarchy too. Self-actualisation is a hypothetical concept that cannot be observed or measured in a laboratory in the same way that ideas within, say, the behaviourist approach can be. This means that Maslow's hierarchy and humanistic psychology in general is short on empirical evidence to support its claims.

5. Humanistic psychologists reject attempts to establish scientific principles of human behaviour. According to the approach, we are all unique, and psychology should concern itself with the study of

subjective experience rather than general laws – a person-centred approach. The concept of self-actualisation is central and refers to the innate tendency that each of us has to want to achieve our full potential and become the best we can possibly be. In Abraham Maslow's hierarchy of needs the four lower levels (deficiency needs) must be met before the individual can work towards self-actualisation – a growth need.

Carl Rogers argued that personal growth requires an individual's concept of self to be congruent with their ideal self (the person they want to be). If too big a gap exists between the two selves, the person will experience a state of incongruence and self-actualisation isn't possible.

In Rogers' client-centred therapy (counselling) the aim is to increase feelings of self-worth and reduce incongruence between the self-concept and the ideal self. An effective therapist should provide the client with three things: genuineness, empathy and unconditional positive regard (which the client may not have received from their parents) so as to remove the psychological barriers that may be preventing self-actualisation.

One strength is that humanistic psychology is anti-reductionist. Humanistic psychologists reject any attempt to break up behaviour and experience into smaller components. They advocate holism – the idea that subjective experience can only be understood by considering the whole person (their relationships, past, present and future, etc.). This approach may have more validity than its alternatives by considering meaningful human behaviour within its real-world context.

However, humanistic psychology, unlike behaviourism, has relatively few concepts that can be reduced to single variables and measured. This means that humanistic psychology in general is short on empirical evidence to support its claims.

Another strength is the approach is a positive one. Humanistic psychologists have been praised for promoting a positive image of the human condition – seeing people as in control of their lives and having the freedom to change. Freud saw human beings as slaves to their past and claimed all of us existed somewhere between 'common unhappiness and absolute despair'. Therefore, humanistic psychology offers a refreshing and optimistic alternative.

One limitation is that the approach may be guilty of a cultural bias. Many humanistic ideas (e.g. self-actualisation), would be more associated with individualist cultures such as the United States. Collectivist cultures such as India, which emphasise the needs of the group, may not identify so easily with the ideals and values of humanistic psychology. Therefore, it is possible that the approach does not apply universally and is a product of the cultural context within which it was developed.

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1. Both approaches offer psychological therapies that are designed to deal with anxiety-related disorders. Freud saw these as emerging from unconscious conflicts and overuse of defence mechanisms, whereas humanistic therapy is based on the idea that reducing incongruence will stimulate personal growth.

2. Behaviourists suggest that all behaviour is environmentally determined by external forces that we cannot control. Skinner famously said that free will is an 'illusion' and even behaviour that appears freely chosen is the result of our reinforcement history. Although social learning theorists agree that we are influenced by our environment to some extent, they also believe that we exert some influence upon it (*reciprocal determinism*). They also place more emphasis on cognitive factors suggesting that we have some control over when we perform particular behaviours.

3. In terms of views on development, the cognitive approach proposes stage theories of child development, particularly the idea of concept formation (schema) as children get older. This is in some ways similar to the biological approach, which suggests that genetically determined maturational changes influence behaviour, for example cognitive/intellectual development. So cognitive advances are not possible until the child is physiologically and genetically 'ready'.

The cognitive approach recognises that many of our information-processing abilities are innate, but are constantly refined by experience. The biological approach would place less emphasis on the influence of experience and instead claims that 'anatomy is destiny': behaviour stems from the genetic blueprint we inherit from our parents. This is an extreme nature approach and distinct from the interactionist approach offered by the cognitive approach.

The cognitive approach advocates machine reductionism in its use of the computer analogy to explain human information processing. This ignores the influence of emotion and motivation on behaviour. The biological approach is also reductionist and explains human behaviour at the level of the gene or neuron – underplaying 'higher level' explanations at a cultural or societal level.

Finally, the cognitive approach has led to cognitive therapies such as cognitive behaviour therapy (CBT) which has been used in the treatment of depression and aims to eradicate faulty thinking. In contrast, psychoactive drugs that have been developed by biological psychologists to regulate chemical imbalances in the brain have revolutionised the treatment of mental disorders. Although such drugs are relatively cheap and fast-acting, they may not be as effective in the long term as cognitive therapies which lead to greater insight.

Chapter 2 Biopsychology

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1. When a stressor is perceived – for instance, your psychology teacher tells you that you have an important test in the morning – the *hypothalamus* triggers activity in the *sympathetic branch* of the ANS. The ANS changes from its normal resting state (the *parasympathetic state*) to the physiologically aroused sympathetic state. The stress hormone *adrenaline* is released from the *adrenal medulla* into the bloodstream. Adrenaline triggers physiological changes in the body, e.g. increased heart rate, dilation of the pupils, decreased production of saliva. This is called the 'fight or flight response'. The body will slowly return to its resting state but the response may be reactivated when you walk into the test room in the morning!

2. The autonomic nervous system (ANS) governs vital functions in the body such as breathing, heart rate, digestion, sexual arousal and stress responses.
The somatic nervous system (SNS) governs muscle movement and receives information from sensory receptors.

3. The major endocrine gland is the *pituitary gland*, located in the brain. It is called the 'master gland' because it controls the release of hormones from all the other endocrine glands in the body. The adrenal gland secretes adrenaline, which is released during the stress response and causes physiological changes in the body, such as increased heart rate.

4. The nervous system is a specialised network of cells and our body's primary communication system. The endocrine system works alongside the nervous system to control vital functions in the body through the action of hormones. The endocrine system supports the nervous system. The endocrine system works much more slowly than the nervous system but has widespread and powerful effects.

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1. *Motor neurons* connect the CNS to effectors such as muscles and glands, whereas *relay neurons* connect sensory neurons to motor or other relay neurons.

2. Neurons vary in size but all have the same basic structure:
Cell body (or soma) – includes a nucleus which contains the genetic material of the cell.
Dendrites – branch-like structures that carry nerve impulses from neighbouring neurons towards the cell body.
Axon – carries the electrical impulse away from the cell body down the neuron.
Terminal buttons at the end of the axon communicate with the next neuron in the chain across the *synapse*.

3. Neurotransmitters generally have either an excitatory or inhibitory effect on the neighbouring neuron. For example, *adrenaline* is generally excitatory, increasing the positive charge of the postsynaptic neuron, making it more likely the neuron will fire. *Serotonin* is generally inhibitory, increasing the negative charge of the postsynaptic neuron, making it less likely the neuron will fire.

4. When the electrical impulse reaches the end of the neuron (the *presynaptic terminal*) it triggers the release of *neurotransmitter* from tiny sacs called *synaptic vesicles*. Once the neurotransmitter crosses the gap, it is taken up by the *postsynaptic receptor* site on the next neuron. The chemical message is converted back into an electrical impulse and the process of electric transmission begins.

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1. Motor area: at the back of the frontal lobe (both hemispheres), it controls voluntary movement. Damage may result in loss of control over fine motor movements.

Somatosensory area: at the front of the parietal lobes, it processes sensory information from the skin (touch, heat, pressure, etc.). The amount of somatosensory area devoted to a particular body part denotes its sensitivity.

Visual area: in the occipital lobe at the back of the brain. Each eye sends information from the right visual field to the left visual cortex, and from the left visual field to the right visual cortex.

2. Peterson *et al.* (1988) used brain scans to show activity in Wernicke's area during a listening task and in Broca's area during a reading task, suggesting these areas of the brain have different functions. Also, a study of long-term memory by Tulving *et al*. (1994) revealed semantic and episodic memories are located in different parts of the prefrontal cortex. Dougherty *et al.* (2002) reported on 44 people with OCD who had had a *cingulotomy* (isolating the cingulate gyrus). At a 32-week follow-up, 30% met the criteria for successful response to surgery and 14% for partial response.

3. A limitation of localisation theory is the existence of contradictory research. The work of Lashley (1950) suggests higher cognitive functions (e.g. learning processes) are not localised but distributed in a more holistic way in the brain. Lashley removed up to 50% of the cortex in rats learning the route through a maze. No one area was more important than any other in terms of the rats' ability to learn the route. As learning required every part of the cortex rather than just particular areas, this suggests learning is too complex to be localised and involves the whole of the brain.

Another limitation is that the language localisation model has been questioned. Dick and Tremblay (2016) found that very few researchers still believe language is only in Broca's and Wernicke's area. Advanced techniques (e.g. fMRI) have identified regions in the right hemisphere and the thalamus. This suggests that, rather than being confined to a couple of key areas, language may be organised more holistically in the brain, which contradicts localisation theory.

4. Scientists in the early 19th century supported the holistic theory that all parts of the brain were involved in processing thought and action. But specific areas of the brain were later linked with specific physical and psychological functions (localisation theory). If an area of the brain is damaged (as in the example) through illness or injury, the function associated with that area is also affected. At the back of the frontal lobe in both hemispheres is the motor area, which controls voluntary movement. Damage, as in the brain-injured client, may result in loss of control over fine motor movements on the opposite side of the body from the damaged hemisphere. The somatosensory area is at the front of the parietal lobes. It processes sensory information from the skin (touch, heat, pressure, etc.). The amount of somatosensory area devoted to a particular body part denotes its sensitivity. Damage to this area will result in a lack of sensitivity to touch, heat, pressure, etc.

Broca's area was identified by Paul Broca in the 1880s, in the left frontal lobe. Damage to this area causes Broca's aphasia, which is characterised by speech that is slow, laborious and lacking in fluency. Broca's patients (as in the example) may have difficulty finding words and naming certain objects. Wernicke's area deals with language comprehension and was identified by Karl Wernicke in the 1880s in the left temporal lobe. Damage to this area causes Wernicke's aphasia, characterised by problems in understanding language (although people are still able to produce language), resulting

in fluent but meaningless speech. People with Wernicke's aphasia will often produce nonsense words (neologisms) as part of the content of their speech.

One strength of localisation theory is support from neurosurgery. Neurosurgery is used to treat mental disorders e.g. cingulotomy involves isolating the cingulate gyrus – dysfunction of this area may be a cause of OCD. Dougherty *et al*. (2002) studied 44 people with OCD who had a cingulotomy. At follow-up, 30% met the criteria for successful response and 14% for partial response. The success of such procedures strongly suggests that behaviours associated with serious mental disorders may be localised.

Another strength of localisation theory is brain scan evidence to support it. Petersen *et al*. (1988) used brain scans to show activity in Wernicke's area during a listening task and in Broca's area during a reading task. Also, a study of long-term memory by Tulving *et al.* (1994) revealed semantic and episodic memories are located in different parts of the prefrontal cortex. There now exists a number of sophisticated and objective methods for measuring activity in the brain, providing sound scientific evidence of localisation of function.

That said, Lashley removed areas of the cortex (up to 50%) in rats learning the route through a maze. Learning required all of the cortex rather than being confined to a particular area. This suggests that higher cognitive processes (e.g. learning) are not localised but distributed in a more holistic way in the brain.

One limitation is the language localisation model has been questioned. Dick and Tremblay (2016) found that very few researchers still believe language is only in Broca's and Wernicke's area. Advanced techniques (e.g. fMRI) have identified regions in the right hemisphere and the thalamus. This suggests that, rather than being confined to a couple of key areas, language may be organised more holistically in the brain, which contradicts localisation theory.

Page 33

1. Eleven split-brain participants were studied by Sperry (1968). An image or word was projected to the right visual field (RVF, processed by the left hemisphere, LH), and the same, or different, image was projected to the left visual field (LVF, processed by the right hemisphere, RH). Presenting the image to one hemisphere meant that the information could not be conveyed from that hemisphere to the other.

When an object is shown to the RVF, the participant can describe what is seen (due to the language centres in the LH). When an object is shown to LVF, the participant cannot name the object (no language centres in RH). They can, however, select a matching object behind a screen using their left hand. They can also select an object closely associated with the picture (e.g. an ashtray if the picture was a cigarette). When a pinup picture was shown to the LVF, the participant giggled but reported seeing nothing. This demonstrates how certain functions are lateralised in the brain, and shows that the LH is verbal and the RH is 'silent' but emotional.

2. As above.

3. One limitation is the idea of analyser versus synthesiser brain may be wrong. There may be different functions in the RH and LH but research suggests people do not have a dominant side, creating a different personality. Nielsen *et al*. (2013) analysed 1000 brain scans, finding people did use certain hemispheres for certain tasks but no dominance. This suggests that the notion of right- or left-brained people is wrong (e.g. 'artist' brain).

4. Sperry devised a *unique procedure* to test his split-brain participants as a way of investigating hemispheric lateralisation. An image or word is projected to a participant's right visual field (processed by the left hemisphere) and another image to the left visual field (processed by the right hemisphere). In the neurotypical brain, the corpus callosum 'shares' information between both hemispheres. In the split brain, the information cannot be conveyed from the chosen hemisphere to the other.

When an object is shown to the RVF, the participant easily describes what is seen. When an object is presented to the LVF, the participant says, 'there's nothing there'. This is because to describe objects in the LVF would require the RH and this hemisphere usually lacks language centres. Messages received by the RH are normally relayed via the corpus callosum to language centres in the LH.

When an object is shown to the LVF, the participant could not name it but could select a matching object using their left hand (connected to RH receiving information from LVF). The left hand could also select an object that was associated with an image presented to the LVF (e.g. ashtray selected in response to a picture of a cigarette). In each case, the participant could not verbally identify what they had seen (because the LH is needed for this) but they could 'understand' what the object was (using the RH) and select the corresponding object.

This evidence suggests that the two hemispheres have different functions.

One strength is support from more recent split-brain studies. Luck *et al*. (1989) showed that split-brain participants are better than normal controls e.g. twice as fast at identifying the odd one out in an array of similar objects. In the normal brain, the LH's superior processing abilities are 'watered down' by the inferior right hemisphere (Kingstone *et al*. 1995). This supports Sperry's earlier findings that the 'left brain' and 'right brain' are distinct in terms of functions and abilities.

One limitation is that causal relationships are hard to establish. In Sperry's research the behaviour of the split-brain participants was compared to a neurotypical control group. However, none of the control group had epilepsy. Any differences between the groups may be due to epilepsy not the split-brain (a confounding variable). This means that some of the unique features of the split-brain participants' cognitive abilities might have been due to their epilepsy.

One final issue is the ethics of the split-brain studies. Sperry's participants were not deliberately harmed and procedures were explained in advance to gain informed consent. However, participants may not have understood they would be tested for many years, and participation was stressful. This suggests that there was no deliberate harm but the negative consequences make the study unethical.

Page 35

1. The brain is plastic in the sense that its structure is not static; synaptic connections are lost, reformed and 'pruned' throughout life, particularly in childhood.

2. Functional recovery of the brain after trauma is an important example of neural plasticity – healthy brain areas take over functions of areas damaged, destroyed or even missing. The brain is able to rewire and reorganise itself by forming new synaptic connections close to the area of damage. *Secondary neural pathways* that would not typically be used to carry out certain functions are activated or 'unmasked' to enable functioning to continue.

Further structural changes may include:
• *Axonal sprouting* – growth of new nerve endings which connect with other undamaged cells to form new neuronal pathways.
• *Reformation of blood vessels*.
• *Recruitment of homologous (similar) areas* on the opposite side of the brain to perform specific tasks.

3. One strength of plasticity and recovery research is its real-world application. Understanding processes involved in plasticity has contributed to the field of *neurorehabilitation*. Understanding axonal growth encourages new therapies. For example, constraint-induced movement therapy involves massed practice with an affected arm while the individual's unaffected arm is restrained. This shows that research into functional recovery helps medical professionals know when interventions can be made

One limitation is that cognitive reserve affects functional recovery of the brain. Evidence suggests a person's educational attainment may influence how well the brain functionally adapts after injury. Schneider *et al.* (2014) found the more time brain injury patients had spent in education (an indication of their *cognitive reserve*), the greater their chances of a disability-free recovery. 40% of patients who achieved DFR had more than 16 years' education compared to about 10% of patients who had less than 12 years' education. This suggests that cognitive reserve is a crucial factor in determining how well the brain adapts after trauma.

4. During infancy, the brain experiences a rapid growth in synaptic connections, peaking at about 15,000 at age 2–3 years (Gopnick *et al.* 1999). As we age, rarely-used connections are deleted and frequently-used connections are strengthened – this is called *synaptic pruning*. It was once thought these changes were limited to childhood. But recent research suggests neural connections can change or be formed at any time, due to learning and experience.

The concept of plasticity is supported by studies which reflect the content of the newspaper article. Maguire *et al*. (2000) found significantly more volume of grey matter in the posterior hippocampus in London taxi drivers than in a matched control group. This part of the brain is linked with the development of spatial and navigational skills. As part of their training, London cabbies take a complex test called 'The Knowledge' to assess their recall of city streets and possible routes. This learning experience appears to alter the structure of the taxi drivers' brains! The longer they had been in the job, the more pronounced was the structural difference.

Plasticity is also supported by Draganski *et al*. (2006) who imaged the brains of medical students three months before and after final exams. Learning-induced changes were seen in the posterior hippocampus and the parietal cortex, presumably as a result of the exam.

Functional recovery of the brain after trauma is an important example of neural plasticity – healthy brain areas take over functions of areas that are damaged, destroyed or even missing. The brain 'rewires' itself by forming new synaptic connections. *Secondary neural pathways* that would not typically be used to carry out certain functions are activated or 'unmasked' to enable functioning to continue.

One limitation of plasticity is possible negative behavioural consequences. The brain's adaptation to prolonged drug use leads to poorer cognitive functioning in later life, as well as an increased risk of dementia (Medina *et al.* 2007). 60–80% of amputees have phantom limb syndrome (experience sensations in missing limb due to changes in somatosensory cortex). This suggests that the brain's

ability to adapt to damage is not always beneficial and may lead to physical and psychological problems.

One strength of plasticity is that it may not decline sharply with age. Ladina Bezzola *et al.* (2012) demonstrated how 40 hours of golf training produced changes in the neural representations in participants aged 40–60. Using fMRI, motor cortex activity in the novice golfers increased compared to a control group, suggesting positive effects after training. This shows that neural plasticity can continue throughout the lifespan.

Finally, seasonal plasticity occurs in response to environmental changes, e.g. the suprachiasmatic nucleus (SCN) shrinks in spring and expands in autumn (Tramontin and Brenowitz 2000). However, much of the work on seasonal plasticity has been done on animals, most notably songbirds. Human behaviour may be controlled differently. This suggests that animal research may be a useful starting point but can't simply be generalised to humans.

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1. fMRI is conducted on live brains whereas post-mortem examinations involve analysis of the brains of dead people. Post-mortems tend to involve the brains of people who have experienced some unusual form of deficit in life. fMRI is equally likely to be performed on neurotypical brains.

2. Electroencephalogram (EEG) measures electrical activity within the brain via electrodes using a skull cap (like a swimming cap with the electrodes attached to it). The scan recording represents the brainwave patterns generated from thousands of neurons. This shows overall brain activity. EEG is often used as a diagnostic tool. For example, unusual arrhythmic patterns of brain activity may indicate abnormalities such as epilepsy, tumours or sleep disorders.

Event-related potentials (ERPs) are what is left when all extraneous brain activity from an EEG recording is filtered out. This is done using a statistical technique, leaving only those responses that relate to the presentation of a specific stimulus or performance of a certain task (for example). ERPs are types of brainwave that are triggered by particular events. Research has revealed many different forms of ERP and how these are linked to cognitive processes (e.g. perception and attention).

3. A limitation of post-mortems is that causation may be an issue. Observed damage in the brain may not be linked to the deficits under review but to some other related trauma or decay.

Another limitation is post-mortem studies raise ethical issues of consent from the patient before death. Patients may not be able to provide informed consent (e.g. patient HM) and families may be unwilling to do so.

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Post-mortem examinations involve the analysis of a person's brain following their death. Areas of the brain are examined to establish the likely cause of a deficit or disorder that the person experienced in life. This may also involve comparison with a neurotypical brain in order to assess the extent of the difference.

A strength of EEG is that it has contributed to our understanding of the stages of sleep. It also has high temporal resolution and can detect brain activity at a resolution of a single millisecond.
A limitation of EEG is that it produces a generalised signal from thousands of neurons which makes it difficult to know the exact source of neural activity. EEG can't distinguish the activity of different but adjacent neurons.

A strength of ERPs is very specific measurement of neural processes. ERPs are more specific than EEGs. Another strength is that, like EEGs, they have excellent temporal resolution. This is especially so compared to fMRI, for example. A limitation of ERPs is lack of standardisation in methodology between studies. This makes it difficult to confirm findings in studies involving ERPs. Another limitation is that background 'noise' and extraneous material must be completely eliminated. This may not always be easy to achieve.

A strength of post-mortems is that they provided the foundation for understanding the brain. Broca and Wernicke both relied on post-mortem studies to link memory deficits to damage in the brain. A limitation of post-mortems is that causation may be an issue. Observed damage in the brain may not be linked to the deficits under review but to some other related trauma or decay. Another limitation is post-mortem studies raise ethical issues of consent from the patient before death. Patients may not be able to provide informed consent (e.g. patient HM).

Page 39

1. The circadian rhythm is a type of biological rhythm which lasts for about 24 hours (*circa* meaning 'about' and *diem* meaning 'day'). There are several important types of circadian rhythm such as the sleep/wake cycle.

2. Folkard *et al.* (1985) studied a group of 12 people who lived in a dark cave for three weeks, going to bed when the clock said 11.45 pm and waking when it said 7.45 am. The researchers gradually speeded up the clock (unbeknown to the participants) so an apparent 24-hour day eventually lasted only 22 hours. Only one participant comfortably adjusted to the new regime. This suggests the existence of a strong free-running circadian rhythm that cannot easily be overridden by changes in the external environment.

3. One strength of circadian rhythm research is practical application to shift work. Boivin *et al*. (1996) found shift workers experience a lapse of concentration around 6 am (a circadian trough) so mistakes and accidents are more likely. Research also suggests a link between shift work and poor health, with shift workers three times more likely to develop heart disease (Knutsson 2003). Thus, research into the sleep/wake cycle may have economic implications in terms of how best to manage worker productivity.

One limitation is that generalisations are difficult to make. Studies of the sleep/wake cycle often use small groups of participants (e.g. Aschoff and Wever), or even single individuals (e.g. Siffre). Participants may not be representative of the wider population and this limits the ability to make meaningful generalisations. Siffre observed that his internal clock ticked much more slowly at 60

than when he was younger. This suggests that, even when the same person is involved, there are factors that may prevent general conclusions being drawn.

4. French caver Siffre spent long periods in dark caves to examine the effects of free-running biological rhythms – two months (in 1962) in the caves of the Southern Alps and six months (in the 1970s) in a Texan cave (when he was 60). In each case study, Siffre's free-running circadian rhythm settled down to just above the usual 24 hours (about 25 hours). Importantly, he did have a regular sleep/wake cycle.

Aschoff and Wever also found a similar circadian rhythm in a similar study. A group of participants spent four weeks in a World War 2 bunker deprived of natural light (Aschoff and Wever 1976). All but one (whose sleep/wake cycle extended to 29 hours) displayed a circadian rhythm between 24 and 25 hours. Siffre's experience and the bunker study suggest that the 'natural' sleep/wake cycle may be slightly longer than 24 hours but is entrained by exogenous zeitgebers associated with our 24-hour day (e.g. number of daylight hours, typical mealtimes, etc.). This suggests the existence of a strong free-running circadian rhythm that cannot easily be overridden by changes in the external environment.

One strength of circadian rhythm research is application to shift work. Shift work creates desynchronisation of biological rhythms. Boivin *et al.* (1996) found shift workers experience a lapse of concentration around 6 am (a circadian trough) so accidents are more likely. Research also suggests a link between shift work and poor health, with shift workers three times more likely to develop heart disease (Knutsson 2003). Thus, research into the sleep/wake cycle may have economic implications in terms of how best to manage shift work.

However, the research is correlational, therefore desynchronisation may not be the cause of observed difficulties. For example, Solomon (1993) concluded that high divorce rates in shift workers might be due to missing out on important family events. This suggests that it may not be biological factors that create the adverse consequences associated with shift work.

Another strength is real-world application to medical treatment. Circadian rhythms co-ordinate the body's basic processes (e.g. heart rate, hormone levels) with implications for chronotherapeutics (timing medication to maximise effects on the body). Aspirin reduces heart attacks, which are most likely in the morning. Bonten *et al*. (2015) found taking aspirin is most effective last thing at night. This shows that circadian rhythm research can help increase the effectiveness of drug treatments.

One limitation is that generalisations are difficult to make. Studies of the sleep/wake cycle often use small groups of participants (e.g. Aschoff and Wever), or even single individuals (e.g. Siffre). Participants may not be representative of the wider population and this limits the ability to make meaningful generalisations. Siffre observed that his internal clock ticked much more slowly at 60 than when he was younger. This suggests that, even when the same person is involved, there are factors that may prevent general conclusions being drawn.

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1. Biological rhythms that occur many times a day are ultradian rhythms, for example the stages of sleep. Infradian rhythms take more than a day to complete, for example the female menstrual cycle.

2. Stern and McClintock (1998) studied 29 women with irregular periods. Pheromones were taken from some of the women at different stages of their cycles, via a cotton pad under their armpits. These pads were cleaned with alcohol and later rubbed on the upper lips of the other participants.

68% of women experienced changes to their cycle which brought them closer to the cycle of their 'odour donor'. This suggest that the female menstrual cycle can be synchronised.

3. One strength is research on the menstrual cycle shows its evolutionary basis. For our distant ancestors it may have been advantageous for females to menstruate together and become pregnant at the same time. In a social group, this would allow babies who had lost their mothers to have access to breast milk, thereby improving their chances of survival. This suggests that synchronisation is an adaptive strategy.

One limitation is the methodology used in synchronisation studies. Commentators argue that there are many factors that may change a woman's menstrual cycle and act as confounding variables in research (e.g. stress, changes in diet). So any pattern of synchronisation (e.g. in Stern and McClintock's study) may have occurred by chance. This may be why other studies (e.g. Trevathan *et al*. 1993) have not replicated Stern and McClintock's original findings. This suggests that menstrual synchrony studies are flawed.

4. Stern and McClintock (1998) studied 29 women with irregular periods (the female menstrual cycle is an example of an infradian rhythm). Pheromones were taken from some of the women at different stages of their cycles, via a cotton pad under their armpits. These pads were cleaned with alcohol and later rubbed on the upper lips of the other participants. 68% of women experienced changes to their cycle which brought them closer to the cycle of their 'odour donor'. This suggest that the female menstrual cycle can be synchronised.

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Our pattern of sleep is an example of an ultradian rhythm and occurs in 90-minute periods. Each period is divided into five stages, each characterised by a different level of brainwave activity (monitored using EEG). Stages 1 and 2 are light sleep where a person may be easily woken. In stage 1, brain waves are high frequency and have a short amplitude (alpha waves). In stage 2, the alpha waves continue but there are occasional random changes in pattern called 'sleep spindles'. Stages 3 and 4 are deeper sleep where it is difficult to rouse someone. Deep sleep or slow wave sleep (SWS) is characterised by individual waves which have lower frequency and higher amplitude. Stage 5 is REM sleep. The body is paralysed yet brain activity closely resembles that of the awake brain. During this time, the brain produces theta waves and the eyes occasionally move around, thus rapid eye movement (REM). Dreams are most often experienced during REM sleep, but may also occur in deep sleep.

One strength is understanding age-related changes in sleep. SWS reduces with age. Growth hormone is produced during SWS so this becomes deficient in older people. van Cauter *et al.* (2000)

suggest the reduced sleep may explain impairments in old age. SWS sleep can be improved using relaxation and medication. This suggests that knowledge of ultradian rhythms has practical value.

One limitation is individual differences in sleep stages. Tucker *et al.* (2007) found large differences between participants in the duration of stages 3 and 4. They suggest that these differences are biologically determined. This makes it difficult to describe 'normal sleep' in any meaningful way.

Page 43

1. Endogenous pacemakers are internal biological 'clocks' such as the suprachiasmatic nucleus which maintain regular rhythms within our body. Exogenous zeitgebers refer to external changes in the environment, such as changes in the pattern of light which affect or entrain our biological rhythms.

2. The influence of the SCN on the sleep/wake cycle was demonstrated with chipmunks and hamsters. DeCoursey *et al.* (2000) destroyed SCN connections in the brains of 30 chipmunks which were returned to their natural habitat and observed for 80 days. Their sleep/wake cycle disappeared and many were killed by predators. This demonstrated the importance of the SCN in maintaining a regular sleep/wake cycle.

3. Light can reset the body's main endogenous pacemaker (SCN), and also has an indirect influence on key processes in the body controlling hormone secretion, blood circulation, etc. Campbell and Murphy (1998) woke 15 participants at various times and shone a light on the backs of their knees – producing a deviation in the sleep/wake cycle of up to 3 hours. This suggests that light is a powerful exogenous zeitgeber detected by skin receptor sites and does not necessarily rely on the eyes to influence the SCN.

4. The suprachiasmatic nucleus (SCN) is a tiny bundle of nerve cells in the hypothalamus which helps maintain circadian rhythms (e.g. sleep/wake cycle). The influence of the SCN on the sleep/wake cycle was demonstrated with chipmunks and hamsters. DeCoursey *et al.* (2000) destroyed SCN connections in the brains of 30 chipmunks which were returned to their natural habitat and observed for 80 days. Their sleep/wake cycle disappeared and many were killed by predators. This demonstrated the importance of the SCN in maintaining a regular sleep/wake cycle.

Light is a key exogeneous zeitgeber that influences the sleep/wake cycle. Light can reset the body's main endogenous pacemaker (SCN), and also has an indirect influence on key processes in the body controlling hormone secretion, blood circulation, etc. Campbell and Murphy (1998) woke 15 participants at various times and shone a light on the backs of their knees – producing a deviation in the sleep/wake cycle of up to 3 hours. This suggest that light is a powerful exogenous zeitgeber detected by skin receptor sites and does not necessarily rely on the eyes to influence the SCN.

Social cues also have an important influence on the sleep/wake cycle. The sleep/wake cycle is fairly random in human newborns, but most babies are entrained by about 16 weeks. Schedules imposed by parents are a key influence, including adult-determined mealtimes and bedtimes.

One limitation of SCN research is that it may obscure other body clocks. Body clocks (peripheral oscillators) are found in many organs and cells (e.g. lungs, skin). They are highly influenced by the actions of the SCN but can act independently. Damiola *et al.* (2000) showed how changing feeding patterns in mice altered circadian rhythms of cells in the liver for up to 12 hours, leaving the SCN unaffected. This suggests there may be many other complex influences on the sleep/ wake cycle, aside from the master clock (SCN).

Another limitation is endogenous pacemakers cannot be studied in isolation. Only in exceptional circumstances are endogenous pacemakers 'free running' and unaffected by the influence of exogenous zeitgebers. Total isolation studies (e.g. Siffre's cave study) are rare. In everyday life, pacemakers and zeitgebers interact so it may make little sense to separate the two. This suggests the more researchers attempt to isolate the influence of internal pacemakers, the lower the validity of the research.

Another issue is the ethics of such research. Animal studies of the sleep/wake cycle are justified because there are similar mechanisms in all mammals, so generalisations can be made to the human brain. However, a disturbing issue is the ethics involved. Animals were exposed to considerable risk in the Decoursey *et al*. study and most died as a result. This suggests that studies like these cannot be justified and researchers should find alternative ways of studying endogenous pacemakers.

One limitation is that the effects of exogenous zeitgebers differ in different environments. Exogenous zeitgebers do not have the same effect on people who live in places where there is very little darkness in summer and very little light in winter. For instance, the Innuit Indians of the Arctic Circle have similar sleep patterns all-year round, despite spending around six months in almost total darkness. This suggests the sleep/wake cycle is primarily controlled by endogenous pacemakers that can override environmental changes in light.

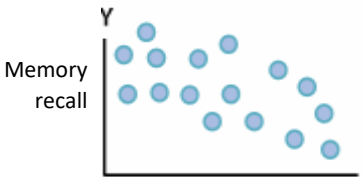
Another limitation is case study evidence undermines the effects of exogenous cues. Miles *et al.* (1977) reported the case of a man, blind from birth, with an abnormal circadian rhythm of 24.9 hours. Despite exposure to social cues, such as mealtimes, his sleep/wake cycle could not be adjusted. This suggests that social cues alone are not effective in resetting the biological rhythm and the natural body clock is stronger.

Chapter 3 Research methods

Page 45

1.

Scattergraph showing the relationship between accuracy of memory recall and age.



2. The relationship could be described as a negative correlation. As age increases, the accuracy of memory falls. The strength of the correlation is moderately strong at –.72 (the closer to +1 or –1 the coefficient is, the stronger the relationship).

3. Correlation coefficients indicate the strength of the correlation and have a value somewhere between –1 and +1. The closer the coefficient is to 1 (+1 or –1), the stronger the relationship between the co-variables. The closer to zero, the weaker the relationship is.

4. A correlation of –.72 would indicate a moderately strong negative relationship between the co-variables.

Page 47

1. This would involve conducting an in-depth study of the father's behaviour over a long period of time (a longitudinal study). In order to get the most reliable and detailed data the researcher might conduct interviews with the mother of the baby, asking her about the amount of time spent with the baby at various ages, the type of activities undertaken, e.g. play, care, feeding. They might additionally ask the father to keep a daily log of similar behaviour so that the two could be cross-referenced.

The researcher could choose to either study what they considered a 'typical' father, for example one that worked 9–5, five days a week, or they may choose a more unusual example, one who works nightshifts and is not awake much of the time that the baby is, or perhaps a father that works away a lot, or one who is always at home.

There could be opportunities for both quantitative data (e.g. how many hours per week spent interacting with the baby) and qualitative data about how the father feels about being a father, etc.

2. Thematic analysis produces qualitative data whereas content analysis produces quantitative data. Content analysis is a form of observational study where people's behaviour is studied via spoken or written forms of interaction, e.g. diaries, articles, etc. This can be coded by categorising to produce the quantitative data whereas the data can also be considered in terms of any recurring themes that can be identified – this would be thematic analysis.

Page 49

1. Reliability is a measure of consistency, and validity is the extent to which the findings are legitimate and genuine in terms of real-world behaviour. So, for example, in the case of an experiment, its reliability would relate to the extent to which it would bear replication and produce the same results whereas its validity would be the extent to which it was measuring what it set out to measure – real-world memory, for example.

2. Inter-observer reliability could first be tested by asking two observers to observe specific behavioural categories independently over the same time period. Examples of some behavioural categories are: crossing the road without pressing the button or pressing the button and waiting for the green man before crossing the road. The results of their observations could then be correlated to measure inter-observer reliability. A correlation of less than +.8 would indicate a need to improve the reliability. This could be done by redefining categories (e.g. adding another category of pressing the button but crossing the road before the green man lights up), retraining the observers and then a repetition of the above procedure until a correlation above +.8 was achieved.

3. The researcher might first have assessed face validity. This is the most basic method and involves simply 'eyeballing' the experiment to check that it appears to be measuring attachment behaviour, or they might even ask an expert to check.

An alternative would be to check concurrent validity. If the experiment was to be considered a reliable measure of attachment behaviour then we could compare the result to those produced by a standardised, accepted measure such as the Strange Situation. It would be expected that the correlation between the performance in the experiment and the existing measure would exceed +.8 to be valid.

Page 50

1. Chi-squared:
The data is nominal (either binge-drinker or not, and over-50 or under-30).
The analysis is a test of difference.
The data is unrelated.

2. Wilcoxon:
The analysis is a test of difference.
The data is ordinal.
The design is related (repeated measures).

3. Chi-squared:
The data is nominal (either depressed or happy, and working day or night shifts).
The analysis is a test of difference.
The data is unrelated.

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1. This means the probability that the observed effect (the result) occurred by chance is equal to or less than 5%. We would then be justified to reject the null hypothesis.

2. Probability is a measure of the likelihood that a particular event will occur, where 0 is a statistical impossibility and 1 a statistical certainty. Psychologists tend to work at the 5% level to decide whether the null hypothesis is accepted or rejected.

3. A Type I error occurs when the null hypothesis is rejected and the alternative hypothesis accepted when actually the null hypothesis is true. A Type II error occurs when the null hypothesis is accepted when actually the alternative hypothesis is true.

A Type I error is most likely to occur when the selected significance level is too lenient (e.g. 10%), whereas a Type II error is most likely to occur when the selected significance is too strict (e.g. 1%).

Page 53

1. $df = 12 + 16 – 2 = 26$

2. $1 – (6 \times 309/20(20 \times 20 – 1))$
$1 – (1854/7980) = 0.77$ (to two decimal places).

3. As the calculated value (0.77) is greater than the critical value (0.380) for a one-tailed test when $p = 0.05$, we can conclude that this result is significant.

Page 54

1. An abstract is a short summary (about 150–200 words in length) that includes all the major elements: the aims and hypotheses, method/procedure, results and conclusions. It appears at the start of a report.

2. Introduction and Discussion.

3. The method section should be detailed to allow replication and is subdivided as follows:
Design – e.g. independent groups, naturalistic observation, etc. and justification given for each choice.
Sample – how many participants, biographical/demographic information (as long as this does not compromise anonymity), the sampling method and target population.
Apparatus/materials – detail of any assessment instruments used and other relevant materials.
Procedure – a 'recipe-style' list of everything that happened in the investigation. This includes a verbatim record of everything that was said to participants: briefing, standardised instructions and debriefing.
Ethics – how these were addressed within the study.

Page 55

1. Replicability – if a scientific theory is to be 'trusted', the findings from it must be shown to be repeatable across a number of different contexts. This will then show the extent to which the findings can be generalised.
Objectivity is another feature and involves ensuring that the personal biases and opinions of the researcher do not impact on the data. The methods that are associated with the highest degree of control tend to be the most objective.

2. Empirical methods such as experimental and observational methods emphasise the importance of data collection based on direct, sensory experience. Early empiricists such as John Locke saw knowledge as determined only by experience and sense perception. A theory cannot claim to be scientific unless it has been empirically tested so empirical methods are essential to the scientific method process.

3. Hypothesis testing is a key part of developing a theory. Theory construction depends on being able to make clear and precise predictions on the basis of the theory (i.e. to state a number of possible hypotheses). A hypothesis can then be tested using scientific methods to determine whether it will be

supported or refuted.

Paradigms are shared sets of assumptions and methods and a shift occurs as a result of a scientific revolution. Once there is too much contradictory research to allow acceptance of a current paradigm, then researchers tend to shift to different assumptions and methods.

4. Falsifiability is a key criterion of a scientific theory in that any genuine theory needs to be both testable and capable of being proved wrong whereas replicability, also a feature of science, relates to the fact that we must be able to gain the same findings across a number of settings in order to be able to trust them and see how generalisable they are.

Chapter 4 Issues and debates in Psychology

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1. Universality refers to any underlying characteristic of human beings that is capable of being applied to all, despite differences of experience and upbringing. The universality of findings in psychology are threatened by gender bias.

Bias is a tendency to treat one individual or group in a different way from others so in terms of gender that would be males and females. Concerns of bias are raised when research or theories offer a view that might not justifiably represent the experience and behaviour of men or women (usually women).

2. Concerns about gender bias are raised when research or theories offer a view that might not justifiably represent the experience and behaviour of men or women (usually women).

Alpha bias is said to occur where the differences between the sexes are presented as real, enduring, fixed and inevitable. These differences occasionally heighten the value of women, but are more likely to devalue females in relation to males. For example, sexual promiscuity in males is naturally selected and genetically determined but females who engage in the same behaviour are seen as going against their 'nature'. This amounts to an exaggeration of the difference between the sexes (alpha bias).

On the other hand, beta bias occurs when differences between men and women are underestimated; for example, where female participants are not included in the research process and it is assumed that research findings apply equally to both sexes. For example, early research into fight or flight was based exclusively on male animals but the fight or flight response was assumed to be a universal response to a threatening situation.

Alpha and beta bias are consequences of androcentrism (male-centredness). Psychology has traditionally been a subject dominated by males – a list of 100 famous psychologists contained just 6 females. This leads to female behaviour being misunderstood and even pathologised (taken as a sign of illness).

3. Gender bias (in the form of alpha bias and beta bias) promotes sexism in the research process. Women are underrepresented in university departments (Murphy *et al.* 2014). Research is more likely to be conducted by males which may disadvantage females. For example, a male researcher may expect female participants to be irrational and unable to complete complex tasks (Nicolson 1995), which may mean they underperform. This means that the institutional structures and methods of psychology may produce findings that are gender-biased.

A further limitation is research challenging bias may not be published. Formanowicz *et al.* (2018) analysed 1000 articles relating to gender bias – such research is funded less often and is published by less prestigious journals. This still held true when gender bias was compared to ethnic bias, and when other factors were controlled (e.g. the gender of the author(s) and methodology). This suggests that gender bias in psychological research may not be taken as seriously as other forms of bias.

4. Concerns about gender bias are raised when research or theories offer a view that might not justifiably represent the experience and behaviour of men or women.

Alpha bias is a form of gender bias that exaggerates differences between males and females. Differences between the sexes are usually presented as fixed and inevitable. These differences occasionally heighten the value of women, but are more likely to devalue females in relation to males. Examples of alpha bias

include psychodynamic theory. Freud (1905) claimed children, in the phallic stage, desire their opposite-sex parent. This is resolved by identification with their same-sex parent. But a girl's identification is weaker, creating a weaker Superego and weaker moral development. There are also examples of alpha bias favouring females; for example, Chodorow (1968) said that daughters and mothers are more connected than sons and mothers because of biological similarities – so women develop better bonds and empathy for others.

Beta bias minimises the differences between men and women. Ignoring or underestimating differences between men and women often occurs when female participants are not included in the research process but it is assumed that research findings apply equally to both sexes. Alpha and beta bias are consequences of androcentrism. Psychology has traditionally been a subject dominated by males – a recent list of 100 famous psychologists contained just six females. This leads to female behaviour being misunderstood and even pathologised (taken as a sign of illness).

The quote on the website is an example of alpha bias. Differences between males and females are exaggerated – the suggestion that all men are better at maths, and all women are better at talking. This creates misleading stereotypes about what males and females are capable of, and may impact upon their choice of subjects at school, eventual career and their own perception of themselves.

Gender bias (in the form of alpha bias and beta bias) promotes sexism in the research process. Women are underrepresented in university departments (Murphy *et al.* 2014). Research is more likely to be conducted by males which may disadvantage females. For example, a male researcher may expect female participants to be irrational and unable to complete complex tasks (Nicolson 1995), which may mean they underperform. This means that the institutional structures and methods of psychology may produce findings that are gender-biased.

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1. Universality refers to any underlying characteristic of human beings that is capable of being applied to all, despite differences of experience and upbringing. The universality of findings in psychology is threatened by culture bias as findings often only reflect the culture of those studied.

Bias is an inclination for or a prejudice against one individual or group. Concerns of bias are raised when research or theories offer a view that might not justifiably represent the experience and behaviour of different cultures. Culture bias means judging a particular behaviour from the standpoint of one particular culture – usually a WEIRD one (Westernised, Educated people from Industrialised, Rich Democracies) as this is where most research takes place. This means that any cultural differences in behaviour will inevitably be seen as 'abnormal', 'inferior' or 'unusual'.

2. Many critics argue that although psychology may claim to have unearthed truths about people all over the world (universality), in reality, findings from studies only apply to the particular groups of people who were studied (i.e. show cultural bias). Researchers have wrongly assumed that findings from studies of WEIRD people (Westernised, Educated people from Industrialised, Rich Democracies) can be applied all over the world. This bias can also lead to ethnocentrism, the belief in the superiority of one's own cultural group.

This is exemplified by Ainsworth and Bell's Strange Situation research, which is criticised as reflecting only the norms and values of American culture in attachment research. They identified that anxiety on separation was the key defining variable of attachment type and that the ideal (or secure) attachment was the infant showing moderate distress when left alone by the mother figure. When cultural variations were noted they tended to be misinterpreted, for example German mothers were seen as cold and rejecting rather than encouraging independence in their children. Thus the Strange Situation was revealed as an inappropriate measure of attachment type for non-US children.

Ainsworth and Bell's research illustrates an imposed etic – they studied behaviours within a single culture (America) and then assumed their ideal attachment type could be applied universally.

3. Cultural relativism helps to avoid cultural bias. The 'facts' that psychologists discover may only make sense from the perspective of the culture within which they were discovered. Being able to recognise this is one way of avoiding cultural bias in research.

Cross-cultural research can challenge dominant individualist ways of thinking and viewing the world. This may provide us with a better understanding of human nature. However, research (e.g. Ekman 1989) suggests that facial expressions for emotions (such as disgust) are the same all over the world, so some behaviours are universal. This suggests a full understanding of human behaviour requires both, but for too long the universal view dominated.

4. A review found that 68% of research participants came from the United States, and 96% from industrialised nations (Henrich *et al*. 2010). Another review found that 80% of research participants were undergraduates studying psychology (Arnett 2008).

What we know about human behaviour has a strong cultural bias. Henrich *et al.* coined the term WEIRD to describe the group of people most likely to be studied by psychologists – Westernised, Educated people from Industrialised, Rich Democracies. If the norm or standard for a particular behaviour is set by WEIRD people, then the behaviour of people from non-Western, less educated, agricultural and poorer cultures is inevitably seen as 'abnormal', 'inferior' or 'unusual'.

A key form of cultural bias is ethnocentrism which refers to the perceived superiority of one culture over others. In psychological research this may be communicated through a view that any behaviour that does not conform to a European/American standard is somehow deficient or underdeveloped. One example of ethnocentrism is the Strange Situation. Ainsworth and Bell's (1970) research on attachment type reflected the norms of US culture. They suggested that ideal (secure) attachment was defined as a baby showing moderate distress when left alone by the mother figure. This has led to misinterpretation of child-rearing practices in other countries which deviated from the US norm, e.g. Japanese babies are rarely left on their own, and are therefore more likely to be classed as insecurely attached as they showed distress on separation (Takahashi 1986).

One limitation is that many classic studies in psychology are culturally-biased. Both Asch's and Milgram's original studies were conducted with white middle-class US participants. Replications of these studies in different countries produced rather different results. Asch-type experiments in collectivist cultures found significantly higher rates of conformity than the original studies in the US, an individualist culture (e.g. Smith and Bond 1993). This suggests our understanding of topics such as social influence should only be applied to individualist cultures.

However, the individualism–collectivism distinction may no longer apply due to increasing global media, e.g. Takano and Osaka (1999) found that 14 of 15 studies comparing the US and Japan found no evidence

of individualist versus collectivist differences. This suggests that cultural bias in research may be less of an issue in more recent psychological research.

One strength of recognising cultural bias is the emergence of cultural psychology. Cultural psychology is the study of how people shape and are shaped by their cultural experience (Cohen 2017). It is an emerging field that takes an emic approach. Research is conducted from inside a culture, often alongside local researchers using culturally-based techniques. Fewer cultures are considered when comparing differences (usually just two). This suggests that modern psychologists are mindful of the dangers of cultural bias and are taking steps to avoid it.

Another limitation is ethnic stereotyping. Gould (1981) explained how the first intelligence tests led to eugenic social policies in America. During WWI psychologists gave IQ tests to 1.75 million army recruits. Many test items were ethnocentric (e.g. name US presidents) so recruits from south-eastern Europe and African-Americans scored lowest and were deemed genetically inferior. This illustrates how cultural bias can be used to justify prejudice and discrimination towards ethnic and cultural groups.

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1. Hard determinism implies that free will is not possible as our behaviour is always caused by internal or external events beyond our control, whereas soft determinism suggests behaviour can also be determined by our free will in the absence of coercion.

Whilst hard determinism is completely compatible with the aims of science, which assume that what we do is dictated by internal or external forces that we cannot control, soft determinism requires scientists to determine the forces acting upon us whilst acknowledging our freedom to make choices.

2. Biological determinism is the belief that behaviour is caused by biological (genetic, hormonal, evolutionary) influences that we cannot control. This is of course associated with the biological approach.
Environmental determinism is the belief that behaviour is caused by features of the environment (such as systems of reward and punishment) that we cannot control. This is very much associated with the behaviourist approach.
Psychic determinism is the belief that behaviour is caused by unconscious conflicts that we cannot control. An example of such an approach is the psychodynamic model.

3. One strength is evidence supports determinism. Libet *et al.* (1983) asked participants to randomly flick their wrist and say when they felt the will to move. Brain activity was also measured. The unconscious brain activity leading up to the conscious decision to move came half a second before the participant's conscious decision to move. This may be interpreted as meaning that even our most basic experiences of free will are actually determined by our brain before we are aware of them.

One limitation of determinism is the role of responsibility in law. The hard determinist stance is not consistent with the way in which our legal system operates. In court, offenders are held responsible for their actions. Indeed, the main principle of our legal system is that the defendant exercised their free will in committing the crime. This suggests that, in the real world, determinist arguments do not work.

Determinism places psychology on an equal footing with other more established sciences and has led to valuable real-world applications, such as therapies. However free will has intuitive appeal. Most of us see ourselves as making our own choices rather than being 'pushed' by forces we cannot control. Some people (e.g. a child of a criminal parent) prefer to think that they are free to self-determine. This suggests that if psychology wants to position itself alongside the natural sciences,

determinist accounts are likely to be preferred. However, common-sense experience may be better understood by an analysis of free will.

4. The free will and determinism debate centres on whether or not human beings are free to choose their thoughts and actions or whether the biological and environmental influences on our behaviour are causal. Hard determinism (*fatalism)* refers to the view that all human action has a cause and it should be possible to identify these causes. Soft determinism refers to the view that human action has a cause but people also have conscious mental control over behaviour.

Biological determinism is the belief that behaviour is caused by biological (genetic, hormonal, evolutionary) influences that we cannot control. This is of course associated with the biological approach. Environmental determinism is the belief that behaviour is caused by features of the environment (such as systems of reward and punishment) that we cannot control. This is very much associated with the behaviourist approach. Psychic determinism is the belief that behaviour is caused by unconscious conflicts that we cannot control and is typically associated with the psychodynamic approach.

The notion that human behaviour is orderly and obeys laws places psychology on an equal footing with other more established sciences, increasing its credibility. Another strength is that the prediction and control of human behaviour has led to the development of treatments and therapies (e.g. drug treatments to manage schizophrenia). The experience of schizophrenia (losing control over thoughts and behaviour) suggests some behaviours are determined (no-one 'chooses' to have schizophrenia).

One strength of free will is it has practical value. Roberts *et al.* (2000) looked at adolescents who had a strong belief in fatalism – that their lives were 'decided' by events outside of their control. These individuals were at greater risk of developing depression. People who exhibit an internal, rather than external, locus of control are more likely to be optimistic. This suggests that, even if we do not have free will, the fact that we believe we do may have a positive impact on mind and behaviour.

One limitation is evidence doesn't support free will, it supports determinism. Libet *et al.* (1983) asked participants to randomly flick their wrist and say when they felt the will to move. Brain activity was also measured. The unconscious brain activity leading up to the conscious decision to move came half a second before the participant's conscious decision to move. This may be interpreted as meaning that even our most basic experiences of free will are actually determined by our brain before we are aware of them.

The fact that people consciously become aware of decisions milliseconds after they had begun to enact the decision still means they may have made the decision to act. Our consciousness of the decision is a 'read-out' of our sometimes unconscious decision-making. This suggests this evidence is not appropriate as a challenge to free will.

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1. The debate centres around the contributions of the two factors to the development of a behaviour. Early nativists (e.g. Descartes) argued that human characteristics are innate, in other words the result of heredity and genes, whereas empiricists (e.g. Locke) argue that the mind is a blank slate at birth upon which experience writes.

As an example, IQ has been researched and the heritability is said to be around 0.5 which suggests that both nature (genes) and nurture (environment) have a role to play in the development of someone's intelligence.

2. The nature–nurture debate centres around the contributions of these two factors to the development of a behaviour. Nativists argue that human characteristics are innate, in other words the result of heredity and genes, whereas empiricists argue that the mind is a blank slate at birth upon which experience writes.

Extreme beliefs in the influence of heredity or environment may have negative implications for how we view human behaviour. Nativists suggest genes determine behaviour and characteristics ('anatomy is destiny'). This has led to controversies such as linking ethnicity to eugenics policies. So increasing recognition that human behaviour is influenced by both nature and nurture is a more reasonable way to approach the study of human behaviour.

A strong commitment to either a nature or nurture position corresponds to a belief in hard determinism. The nativist perspective suggests 'anatomy is destiny', whilst empiricists argue that interaction with the environment is all. These equate to biological determinism and environmental determinism, showing how nature–nurture links to other debates.

3. The extreme nativist stance is determinist and has led to controversy, e.g. linking ethnicity, genetics and intelligence, and eugenic policies. Empiricists suggest that any behaviour can be changed by altering environmental conditions (e.g. aversion therapy). This may lead to a society that controls and manipulates its citizens. This shows that both positions, taken to extremes, may have dangerous consequences for society so a moderate, interactionist position is preferred.

4. Early nativists (e.g. Descartes, 17th century) argued that human characteristics are innate – the result of our genes. Psychological characteristics (e.g. intelligence or personality) are determined by biological factors, just like eye colour or height. This is nurture, the influence of the environment. Empiricists (e.g. Locke, 17th century) argued the mind is a blank slate at birth, and is shaped by interaction with the environment e.g. the behaviourist approach. The nature–nurture debate considers the relative contribution of each of these influences.

The nature–nurture debate is not really a debate because all characteristics combine nature and nurture (even eye colour is only .80 heritable). For example attachment can be explained in terms of quality of parental love (Bowlby 1958) or child's temperament (Kagan 1984). Environment and heredity therefore interact.

In the diathesis-stress model behaviour is caused by a biological/environmental vulnerability (diathesis) which is only expressed when coupled with a biological/environmental trigger (stressor). For example, a person who inherits a genetic vulnerability for OCD may not develop the disorder. But, combined with a psychological trigger (e.g. a traumatic experience) this may result in the disorder appearing.

This suggests that the quote in the question is correct, that nature and nurture cannot be separated and

we are all a combination of both influences. It is meaningless to try and disentangle the two influences as they both influence each other as soon as (and possible before) we are born.

One strength in nature–nurture research is adoption studies. If adopted children are more similar to their adoptive parents, this suggests environmental influence. If they are more similar to their biological parents, this suggests genetic influence. Rhee and Waldman (2002) found in a meta-analysis of adoption studies that genetic influences accounted for 41% of variance in aggression. This shows how research can separate nature and nurture influences.

However, children create their own nurture by selecting environments appropriate to their nature. For example, a naturally aggressive child will choose aggressive friends and become more aggressive (what Plomin called 'niche-picking'). This suggests that it does not make sense to look at evidence of either nature or nurture.

Another strength of the nature–nurture debate is support for epigenetics. In 1944, the Nazis blocked the distribution of food to the Dutch people and 22,000 died of starvation (the Dutch Hunger Winter). Susser and Lin (1992) found that women who became pregnant during the famine had low birth weight babies who were twice as likely to develop schizophrenia. This suggests that the life experiences of previous generations can leave epigenetic 'markers' that influence the health of their offspring.

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1. The notion of levels of explanation suggests there are different ways of viewing the same phenomena in psychology and some are more reductionist than others. (Reductionist approaches analyse behaviour by breaking it down into smaller units.)

For example, OCD may be understood at a socio-cultural level as it involves behaviour most people would regard as odd (e.g. repetitive hand-washing). It could also be understood at a psychological level by focusing on the individual's experience of having obsessive thoughts, or a physical level involving the sequence of movements involved in washing one's hands, or an environmental level involving learning experiences. The level of reductionism increases in each case with the physiological level focusing on abnormal functioning in the frontal lobes and the neurochemical level explaining the OCD in terms of underproduction of serotonin.

2. Reductionist approaches analyse behaviour by breaking it down into smaller units.

Biological reductionist stances assume that all behaviour is at some level biological and can be explained through neurochemical, neurophysiological, evolutionary and genetic influences. This assumption has been successfully applied to the explanation and treatment of mental disorder, for example depression treatment by antidepressants.

The behaviourist approach is built on environmental reductionism and behaviourists study observable behaviour, breaking complex learning down into simple stimulus–response links.

In an environmental determinist approach the key unit of analysis occurs at the physical level. The behaviourist approach, as an example, is not concerned with cognitive processes at the psychological level. Instead the mind is regarded as a 'black box' and irrelevant to our understanding of behaviour. This approach has been successfully applied in behaviour management in schools and other settings.

3. One strength of reductionism is its scientific status. In order to conduct well-controlled research, variables need to operationalised – target behaviours broken down into constituent parts. This makes it

possible to conduct experiments or record observations (behavioural categories) in a way that is objective and reliable. This scientific approach gives psychology greater credibility, placing it on equal terms with the natural sciences.

However, reductionist explanations at the level of the gene or neurotransmitter do not include an analysis of the context within which behaviour occurs and therefore lack meaning. This suggests that reductionist explanations can only ever form part of an explanation.

One limitation of reductionism is the need for higher level explanations. There are aspects of social behaviour that only emerge within a group context and cannot be understood in terms of the individual group members. For example, the Stanford prison study could not be understood by observing the participants as individuals, it was the behaviour of the group that was important. This shows that, for some behaviours, higher (or even holistic) level explanations provide a more valid account.

4. The holism–reductionism debate discusses which position is preferable for psychology – study the whole person (holism) or study component parts (reductionism)? As soon as you break down the 'whole' it isn't holistic. Reductionism can be broken down into levels of explanation. Holism proposes that it only makes sense to study a whole system – the whole is greater than the sum of its parts (Gestalt psychology). For example humanistic psychology focuses on experience which can't be reduced to biological units, qualitative methods investigate themes.

Reductionism is based on the scientific principle of parsimony – that all phenomena should be explained using the simplest (lowest level) principles. For example, OCD may be understood in different ways:
• Socio-cultural level – behaviour most people would regard as odd (e.g. repetitive handwashing).
• Psychological level – the individual's experience of having obsessive thoughts.
• Physical level – the sequence of movements involved in washing one's hands.
• Environmental/behavioural level – learning experiences (conditioning).
• Physiological level – abnormal functioning in the frontal lobes.
• Neurochemical level – underproduction of serotonin.
We can argue about which is the 'best' explanation of OCD, but each level is more reductionist than the one before.

One limitation of holism is that it may lack practical value. Holistic accounts of human behaviour become hard to use as they become more complex which presents researchers with a practical dilemma. If many different factors contribute to, say, depression, then it becomes difficult to know which is most influential and which to prioritise for treatment. This suggests that holistic accounts may lack practical value (whereas reductionist account may be better).

One strength of reductionism is its scientific status. In order to conduct well-controlled research variables need to operationalised – target behaviours broken down into constituent parts. This makes it possible to conduct experiments or record observations (behavioural categories) in a way that is objective and reliable. This scientific approach gives psychology greater credibility, placing it on equal terms with the natural sciences.

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participants as individuals, it was the behaviour of the group that was important. This shows that, for some behaviours, higher (or even holistic) level explanations provide a more valid account.

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1. Idiographic approaches aim to describe the nature of the individual, so people are studied as unique entities with their own subjective experiences, motivations and values. There is no attempt to compare these to a larger group standard or norm. Humanistic psychology is the best example of this approach. Rogers and Maslow were interested only in documenting the conscious experience of the individual or 'self', rather than producing general laws of behaviour.

The nomothetic approach aims to produce general laws of behaviour which can then provide a benchmark against which people can be compared, classified and measured. Future behaviour can also be predicted and controlled if necessary. Behaviourist research would meet the criteria of the nomothetic approach, for example when it tests the response of a large group of people to a given stimulus.

2. Idiographic approaches aim to describe the nature of the individual so people are studied as unique entities with their own subjective experiences, motivations and values, whereas the nomothetic approach aims to produce general laws of behaviour which can then provide a benchmark against which people can be compared, classified and measured.

Idiographic approaches typically employ psychological methods which produce qualitative data such as case studies and unstructured interviews, whereas the nomothetic approach would be more likely to use questionnaires and psychological tests to establish how people are similar to or different from one another.

3. One limitation of the nomothetic approach is that it focuses on general laws and may 'lose the whole person' within psychology. For example, knowing about a 1% lifetime risk of schizophrenia says little about having the disorder – which might be useful for therapeutic ideas. This means, in its search for generalities, the nomothetic approach may sometimes fail to relate to 'experience'.

4. The idiographic–nomothetic debate is a debate over which position is preferable for psychology: the detailed study of one individual or one group to provide in-depth understanding (idiographic), or the study of larger groups with the aim of discovering norms, universal principles or 'laws' of behaviour (nomothetic). The two approaches may both have a place within a scientific study of the person.

In an idiographic investigation the number of participants is small, often a single individual/group, though research might include others e.g. family, friends. The initial focus is about understanding the individual, but generalisations may be made based on the findings. The approach is built around qualitative research e.g. an individual with depression might be interviewed, from which emergent themes are identified and conclusions formed. This might help inform mental health professionals to determine best practice.

The nomothetic approach is associated with quantitative research. General principles of behaviour (laws) are developed which are then applied in individual situations, such as in therapy. Hypotheses are formulated, samples of people (or animals) are gathered and data analysed for its statistical significance. Nomothetic approaches seek to quantify (count) human behaviour.

One strength is idiographic and nomothetic approaches work together. The idiographic approach uses in-depth qualitative methods which complements the nomothetic approach by providing detail. In-depth

case studies such as HM (damaged memory) may reveal insights about normal functioning which contribute to our overall understanding. This suggests that even though the focus is on fewer individuals, the idiographic approach may help form 'scientific' laws of behaviour.

However, the idiographic approach on its own is restricted as there is no baseline for comparison. This suggests that it is difficult to build effective general theories of human behaviour in the complete absence of nomothetic research.

Another strength is that both approaches fit with the aims of science. Nomothetic research (like the natural sciences) seeks objectivity through standardisation, control and statistical testing. Idiographic research also seeks objectivity through triangulation (comparing a range of studies), and reflexivity (researchers examine their own biases). This suggests that both the nomothetic and idiographic approaches raise psychology's status as a science.

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1. Ethical implications are the impact that psychological research may have at a societal level, in terms of influencing public policy and/or the way in which certain groups of people are regarded. For example, Bowlby's argument, that mother love in infancy is as important for mental health as vitamins are for physical health, influenced the way in which at least one generation of children were raised. It may have also influenced the UK government's decision not to offer free child care places to children under-five (despite the fact that this is typical in other European countries).

2. The phrasing of the research question influences how the findings are interpreted. For example, if a research study is looking at 'alternative relationships' this is likely to focus on homosexual relationships and may overlook heterosexual ones because 'alternative' suggests alternative to heterosexual relationships (Kitzinger and Coyle 1995). Also, there is the issue of dealing with participants which may include informed consent, confidentiality and psychological harm. For example, when interviewing victims of domestic abuse, participants may worry about an ex-partner finding out what they said and also participants may find the experience of talking about abusive experiences stressful.

3. Same as above.

4. Psychologists must be aware of the consequences of research for the research participants or for the group of people represented by the research. Some research is more socially sensitive (e.g. studying depression) but even seemingly innocuous research (e.g. long-term memory in a student population) may have consequences (e.g. for exam policy).

The potential consequences of research studies and/or theories should be considered at all stages of the research process. For instance, the phrasing of the research question influences how the findings are interpreted. For example, if a research study is looking at 'alternative relationships' this is likely to focus on homosexual relationships and may overlook heterosexual ones because 'alternative' suggests alternative to heterosexual relationships (Kitzinger and Coyle 1995). Another issue is dealing with participants and the issues of informed consent, confidentiality and psychological harm. For example, when interviewing victims of domestic abuse, participants may worry about an ex-partner finding out what they said and also participants may find the experience of talking about abusive experiences

stressful. Finally, there is a need to consider in advance how findings might be used, especially because findings may give scientific credence to prejudices. For example, the use of early (flawed) IQ tests in America during World War I led to prejudice against Eastern Europeans and lower immigration quota.

One strength of socially sensitive research (SSR) is the benefits for the group that is studied. The DSM-1 listed homosexuality as a 'sociopathic personality disorder' but this was finally removed in 1973, as a result of the Kinsey report (Kinsey *et al*. 1948). Anonymous interviews with over 5000 men about their sexual behaviour concluded that homosexuality is a normal variant of human sexual behaviour. This illustrates the importance of researchers tackling topics that are sensitive.

However there may be negative consequences that could have been anticipated, e.g. research on the 'criminal gene' implies that people can't be held responsible for their wrongdoing. This suggests that, when researching socially sensitive topics, there is a need for very careful consideration of the possible outcomes and their consequences.

Another strength is that policymakers rely on SSR. The government needs research when developing social policy related to child care, education, mental health provision, crime etc. It is better to base such policies on scientific research rather than politically-motivated views. For example the ONS (Office for National Statistics) is responsible for collecting, analysing and disseminating objective statistics about the UK's economy, society and population. This means that psychologists also have an important role to play in providing high quality research on socially sensitive topics.

Finally, one limitation is that poor research design may have a long-term impact. For example, Burt's (1955) research on IQ showed it is genetic, fixed and apparent by age 11. This led to the 11+ exam which meant not all children had the same educational opportunities. The research was later revealed to be based on invented evidence but the system didn't change and continues in parts of the UK today (e.g. Kent and Belfast). Therefore any SSR needs to be planned with the greatest care to ensure the findings are valid because of the enduring effects on particular groups of people.

Chapter 5 Relationships

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1. Sexual selection is an evolutionary explanation of partner preference. Attributes or behaviours that increase reproductive success are passed on and may become exaggerated over succeeding generations of the offspring. This explains why some characteristics that might appear disadvantageous actually confer an advantage in human reproductive behaviour because the characteristics are attractive to potential mates.

2. Partner preference is based on anisogamy. Male sperm are continuously produced from puberty to old age whereas female ova are produced at intervals for a limited time. Therefore there are many fertile males but fewer fertile females. This gives rise to two strategies for choosing a partner.

The preferred strategy of females is inter-sexual. Quality of mates is more important than quantity because ova are relatively rare. The female makes a greater investment of resources before, during and after the birth of her offspring. Although both sexes are choosy, the consequences of making a wrong choice are much more serious for the female than for the male. Therefore, the female's optimum mating strategy is to select a genetically fit partner who can provide resources. This leaves the males competing for the opportunity to mate with the fertile female and the attributes of fit partners are passed on through generations.

The preferred strategy of males is intra-sexual. Quantity of mates is more important than quality because sperm is plentiful. So males prefer youthful partners because they are likely to be fertile, and males seek indictors of fertility such as a narrow waist and wider hips. The winner of competition between males for a fertile female is the one who reproduces and passes on to his offspring the characteristics that contributed to his victory. These include physical characteristics such as size. But, more controversially, they also include psychological and behavioural characteristics such as deceitfulness, intelligence and aggression. Female preference drives the evolutionary selection of these characteristics in males.

3. One limitation is that social and cultural influences are underestimated. Partner preferences have been impacted over time by changing social norms and cultural practices. The changes have occurred too rapidly to be explained in evolutionary terms. The wider availability of contraception and changing roles in the workplace mean women's partner preferences are no longer resource-oriented (Bereczkei *et al.* 1997). This suggests that partner preferences today are likely to be due to both evolutionary and cultural influences – a theory which fails to explain both is limited.

However, one strength of the relationship is evidence supporting intrasexual selection. Buss's (1989) cross-cultural study in 33 countries found that females still placed greater value on resource-related attributes than males did (e.g. ambition, prospects). Males valued physical attractiveness and youth (indicator of fertility) more than females did. This outcome reflects consistent gender differences in partner preferences that support predictions of sexual selection.

4. Partner preference is based on anisogamy. Male sperm are continuously produced from puberty to old age whereas female ova are produced at intervals for a limited time. Therefore there are many fertile males but fewer fertile females. This gives rise to two strategies for choosing a partner.

The preferred strategy of females is inter-sexual. Quality of mates is more important than quantity because ova are relatively rare. The female makes a greater investment of resources before, during and after the birth of her offspring. Although both sexes are choosy, the consequences of making a wrong choice are much more serious for the female than for the male. Therefore, the female's

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Research into inter-sexual selection is also supportive of the relationship. Clark and Hatfield (1989) sent students to approach other students and ask, 'I have been noticing you around campus. I find you to be very attractive. Would you go to bed with me tonight?'. No female students agreed in response to requests from males. But 75% of males did agree to female requests. This supports the suggestion of female choosiness and that males have evolved a different strategy to ensure their reproductive success.

However, the relationship suggested by evolutionary theory between sexual selection and reproductive behaviour is simplistic. It is not the case that one strategy is adaptive for all males and another strategy adaptive for all females. It depends on the length of the relationship. Buss and Schmitt (2016) argue that males and females seeking long-term relationships in fact adopt similar mating strategies – both are very choosy and look for loyalty and kindness. The true picture of partner preference is complex and nuanced because it takes account of the context of reproductive behaviour.

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1. Self-disclosure is the concept of revealing personal information about yourself. Romantic partners reveal more about their true selves as their relationship develops. These self-disclosures about one's deepest thoughts and feelings can strengthen a romantic bond when used appropriately.

2. Altman and Taylor (1973) proposed the social penetration theory of self-disclosure suggesting that self-disclosure is quite limited at the start of a relationship. As the relationship progresses there is a gradual process of revealing your inner self to your partner. Revealing personal information is a sign of trust and the partner will reciprocate with revealing information about themselves, too. Increasing disclosure means that the romantic partners tend to penetrate into each other's lives and gain a greater understanding of each other.

Both breadth and depth of self-disclosure are key according to the social penetration theory. Breadth is

narrow at the start of a relationship because if too much information is revealed this may be off-putting and one partner may decide to quit the relationship. As a relationship develops, more layers are gradually revealed and we are likely to reveal more intimate information including painful memories, secrets, etc.

Reis and Shaver (1988) suggest that, in addition to a broadening and deepening of self-disclosure, there must be reciprocity, in other words successful relationships will involve disclosure from one partner which is received sensitively by the other partner and this in turn should then lead to further self-disclosure from the other partner.

3. One strength is that there is some support from research studies. For example, Sprecher and Hendrick (2004) found strong correlations between several measures of satisfaction and self-disclosure in heterosexual couples. Men and women who used self-disclosure (and those who believed their partners also disclosed) were more satisfied with and committed to their romantic relationship. Whilst this is supportive of a relationship between self-disclosure and satisfaction we cannot make causal assumptions from such data. Therefore, it gives only limited support to the concept of self-disclosure being a key component of committed romantic relationships.

4. Altman and Taylor (1973) proposed the social penetration theory of self-disclosure, suggesting that self-disclosure is quite limited at the start of a relationship. As the relationship progresses there is a gradual process of revealing the inner self to the partner. In the case of Asad and Sabiha, if they were on a first date it would not be expected that very personal information would be revealed. Sabiha is therefore likely to be surprised at Asad's revelation that he wants to get married and start a family very soon.

Increasing disclosure means that the romantic partners tend to penetrate into each other's lives and gain a greater understanding of each other. So Sabiha would have expected that level of disclosure to have occurred more gradually than it did.

According to the social penetration theory, breadth of self-disclosure is narrow at the start of a relationship and if too much information is revealed this may be off-putting and one partner may decide to quit the relationship as happened here when Sabiha decided not to go on a second date.

Reis and Shaver (1988) suggest that, in addition to a broadening and deepening of self-disclosure, there must be reciprocity in this scenario. Sabiha seemed to be unwilling to engage in similar levels of self-disclosure and therefore the trust that comes from reciprocal disclosure was not exhibited and the relationship faltered.

There is evidence in support of the role of self-disclosure. Sprecher and Hendrick (2004) found strong correlations between several measures of satisfaction and self-disclosure in heterosexual couples. Men and women who used self-disclosure (and those who believed their partners also disclosed) were more satisfied with and committed to their romantic relationship. Whilst this is supportive of a relationship between self-disclosure and satisfaction we cannot make causal assumptions from such data. Therefore, it gives only limited support to the concept of self-disclosure being a key component of committed romantic relationships.

Hass and Stafford (1998) also found that 57% of homosexual men and women reported open and honest self-disclosure was a maintenance strategy. Couples used to 'small talk' can be encouraged to increase self-disclosure in order to deepen their own relationships. This highlights the importance of self-disclosure and suggests the theory can be used to support people having relationship problems.

However, Tang *et al*. (2013) concluded that people in the US (an individualist culture) self-disclose significantly more sexual thoughts and feelings than people in China (a collectivist culture). Both levels of self-disclosure are linked to relationship satisfaction in those cultures but nevertheless the pattern of self-disclosure is different. Social penetration theory is therefore a limited explanation of romantic relationships and not necessarily generalisable to other cultures.

Also, sometimes breakdown of relationships is characterised by a reduction in self-disclosure. However, this is not always the case. Duck's (2007) phase model of the breakdown of relationships recognises that couples often discuss their relationship with each other in intimate detail (i.e. self-disclose) yet this may not be sufficient to save the relationship. This suggests that increased self-disclosure may not always lead to positive developments in a relationship.

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1. Shackelford and Larsen (1997) found that people with symmetrical faces are rated as more attractive. It is thought that this is a signal of genetic fitness that cannot be faked (which makes it an 'honest' signal). The associated 'robust' genes are likely to be passed on and therefore symmetry is perpetuated.

Research by Dion *et al*. (1972) found that physically attractive people are consistently rated as kind, strong, sociable and successful compared with unattractive people. This is known as the 'halo effect' and suggests we hold preconceived ideas about the attributes of attractive people. We believe that all their other attributes are overwhelmingly positive.

On the other hand, the matching hypothesis (Walster *et al*. 1966) states that people choose romantic partners who are roughly of similar physical attractiveness to each other, rather than the most attractive available. To do this we have to make a realistic judgement about our own 'value' to a potential partner and choose one of similar rating to avoid potential rejection.

2. Psychologists have sought to explain why physical attractiveness seems to be quite so important in forming relationships. Whilst the evolutionary explanation would propose that we would seek attractive mates either because this is a sign of genetic fitness (e.g. facial symmetry) or that it promotes caring instincts (e.g. neotenous, baby-like features), the matching hypothesis by Walster *et al* (1966) proposes that rather than seeking the most attractive partner, as might be suggested by evolutionary theories, we in fact choose a partner whose attractiveness matches ours.

To do this we need to assess our own value to a potential partner. For example, if we judge ourselves as 6/10 then we are likely to seek a mate of a similar level of attractiveness.

The argument is that by seeking the most attractive mate (who may provide us with the best offspring) we run the risk of being rejected because the partner we aim for is 'out of our league' in terms of attractiveness. As such we choose someone who we judge to be in the 'same league'.

3. A limitation of the matching hypothesis is that it is challenged by real-world research outside the lab.

Taylor *et al*. (2011) studied actual online date *choices* rather than preferences. Their analysis of activity logs of an online dating site showed that daters generally wanted to meet with potential partners who were more physically attractive than themselves. The matching hypothesis predicts that daters would limit their choices to people of a similar level of attractiveness, so this contradicts its central prediction.

Therefore the matching hypothesis may lack validity because it does not generalise easily from laboratory situations to physical attractiveness in the real world.

4. One factor thought to be important in relation to attraction in romantic relationships is physical attractiveness. Whilst the evolutionary explanation would propose that we would seek attractive mates either because this is a sign of genetic fitness (e.g. facial symmetry) or that it promotes caring instincts (e.g. neotenous, baby-like features), the matching hypothesis by Walster *et al* (1966) proposes that rather than seeking the most attractive partner, as might be suggested by evolutionary theories, we in fact choose a partner whose attractiveness matches ours. To do this we assess our own value to a potential partner. For example, if we judge ourselves as 6/10 then we are likely to seek a mate of a similar level of attractiveness. By not seeking the most attractive mate (who may provide us with the best offspring) we reduce the risk of being rejected.

However, Walster *et al*.'s (1966) initial study failed to support the theory as they found students preferred partners who were more physically attractive rather than matching their level. On the other hand, Feingold's (1988) meta-analysis of studies of 'actual' partners found a significant correlation in ratings of attractiveness between them. These findings from more realistic studies support the hypothesis even though the original studies did not.

There is also cultural consistency in what is considered attractive. Cunningham *et al*. (1995) found large eyes, small nose and prominent cheekbones in females were rated as highly attractive by white, Asian and Hispanic males. This consistency suggests physical attractiveness is culturally independent and may have evolutionary roots.

A second factor affecting attraction is self-disclosure. Altman and Taylor (1973) proposed the social penetration theory suggesting that self-disclosure is quite limited at the start of a relationship. As the relationship progresses there is a gradual process of revealing the inner self to the partner. Revealing personal information is a sign of trust and the partner will reciprocate with revealing information about themselves too. Increasing disclosure means that the romantic partners tend to penetrate into each other's lives and gain a greater understanding of each other.

There is evidence in support of the role of self-disclosure. Sprecher and Hendrick (2004) found strong correlations between several measures of satisfaction and self-disclosure in heterosexual couples. Men and women who used self-disclosure (and those who believed their partners also disclosed) were more satisfied with and committed to their romantic relationship. This supports the concept of self-disclosure being a key component of committed romantic relationships.

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However, Tang *et al*. (2013) concluded that people in the US (an individualist culture) self-disclose significantly more sexual thoughts and feelings than people in China (a collectivist culture). Both levels of self-disclosure are linked to relationship satisfaction in those cultures but nevertheless the pattern of self-disclosure is different. Social penetration theory is therefore a limited explanation of romantic relationships and not necessarily generalisable to other cultures.

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1. Social demography refers to factors such as geographical location and social class. These two, for example, have been shown to rule out a large number of available partners. This means many relationships are formed between partners who share similar characteristics (homogamy).

Similarity in attitudes refers to the fact we find partners who share our basic values attractive in the earlier stages of a relationship, so we tend to discount available individuals who differ markedly from us in their attitudes.

Complementarity refers to the fact that similarity becomes less important as a relationship develops, and is replaced by a need for your partner to balance your traits with opposite ones of their own.

2. According to the filter theory there are three main factors that act as filters to narrow down our range of partner choice to a *field of desirables*. The first is social demography. They include geographical location (or *proximity*), social class, level of education, for example. You are much more likely to meet people who are physically close and share several of these demographic characteristics. The key benefit of proximity is *accessibility*. It doesn't require much effort to meet people who live in the same area, go to the same school or university, and so on.

The second filter is similarity in attitudes. Partners will often share important beliefs and values, partly because the *field of availables* has already been narrowed by the first filter to those who have significant social and cultural characteristics in common. There is a need for partners in the earlier stages of a relationship to agree over basic values, the things that really matter to them. Similarity is such a powerful influence on attraction in the early stages that Byrne (1997) calls it the *law of attraction*.

3. One strength is research support for two filters from Kerckhoff and Davis's original (1962) study. They found that relationship closeness was associated with similarity of values in partners who had been together less than 18 months. Complementarity of needs was associated with closeness after this time. This supports the view that similarity is important in the early stages of a relationship, but complementarity is more important later on, as predicted by the theory.

One limitation is the lack of replication of the original findings. Levinger (1974) has suggested that social change and difficulties in defining the depth of a relationship could be the reason for lack of replicability. Kerckhoff and Davis (1962) assumed that partners that had been together for over 18 months were more committed but this might not be the case in all cultures or cases today. This suggests that filter theory is based on research evidence that lacks validity.

Another limitation is that actual similarity may be less important than perceived similarity. Montoya *et al*.'s (2008) meta-analysis showed that actual similarity affected attraction only in short-term lab-based interactions. In real-world relationships, perceived similarity was a stronger predictor of attraction. This implies that the theory has the link the wrong way round – partners perceive greater similarity as they become more attracted, so similarity is an effect of attraction and not a cause.

A final limitation is that complementarity does not always predict satisfaction. For instance, Markey and Markey (2013) found greatest relationship satisfaction in lesbian couples of equal dominance. Therefore similarity of needs rather than complementarity may be associated with long-term satisfaction, at least in some couples.

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(or *proximity*), social class, level of education, etc. You are more likely to meet people who are physically close and share these demographic characteristics. This supports the view that 'birds of a feather flock together', meaning that people are attracted to people similar to themselves in these ways. The filter theory would therefore suggest that we actually filter out 'opposites' rather than being attracted to them.

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A final limitation is that complementarity does not always predict satisfaction. For instance, Markey and Markey (2013) found greatest relationship satisfaction in lesbian couples of equal dominance. Therefore similarity of needs rather than complementarity may be associated with long-term satisfaction (which suggests that birds of a feather continue to flock together in longer-term relationships), at least in some couples.

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1. Social exchange theory assumes that romantic partners act out of self-interest in exchanging rewards and costs. A satisfying and committed relationship is maintained when rewards exceed costs and potential alternatives are less attractive than the current relationship.

Rewards could include companionship, sex, and emotional support. Costs might include time, stress, energy, compromise, and so on. Also in economic terms, a relationship incurs another kind of cost, an *opportunity cost*. Your investment of time and energy in your current relationship means using resources that you cannot invest elsewhere – this could include other romantic relationships or even friendships.

The theory assumes that we measure the profit in a romantic relationship first by the comparison level (CL) – the amount of reward that you believe you deserve to get. It develops out of our experiences of previous relationships and social norms which feed into our expectations of the current one. We

consider a relationship worth pursuing where the CL is high.

The second measure of profit considers the comparison level for alternatives (CLalt) where we compare our current profit with the potential rewards and costs from another relationship. SET predicts that we will stay in our current relationship as long as we believe it is more rewarding than the alternatives.

2. The answer to question 1 above could also be used here (an alternative theory is filter theory – see answers for p77).

3. One limitation is that studies into SET ignore the role of equity. What matters to most romantic partners is not the balance of rewards and costs but the partners perception that the ratio of rewards to costs is fair. This neglect of equity means that SET is a limited explanation that does not account for a significant proportion of research findings that confirm the importance of equity.

Another limitation is that SET deals in concepts that are vague and hard to quantify. Unlike in research, real-world rewards/costs are subjective and hard to define because they vary, e.g. 'having your partner's loyalty' is not rewarding for everyone. Also comparison levels are problematic – it is unclear what the values of CL and CLalt need to be before individuals feel dissatisfied. This means SET is difficult to test in a valid way.

4. Social exchange theory assumes that romantic partners act out of self-interest in exchanging rewards and costs. SET suggests that a satisfying and committed relationship is maintained when rewards exceed costs and potential alternatives are less attractive than the current relationship. Dom is striving to ensure that Shelley also feels rewarded but is struggling to maintain the same levels as she is giving him. They are both likely to be considering the profit of their relationship by offsetting the costs such as time and stress against these rewards.

SET assumes that we measure the profit in a romantic relationship first by the comparison level (CL) – the amount of reward that you believe you deserve to get. It develops out of our experiences of previous relationships and social norms which feed into our expectations of the current one. We consider a relationship worth pursuing if our CL is high, so whether Dom and Shelley's relationship continues will depend on their expectations and also their judgement of the comparison level for alternatives (CLalt). This is where they will compare their current profit with the potential rewards and costs from another relationship. SET predicts Dom and Steph will stay in their relationship as long as they believe it is more rewarding than the alternatives.

A strength of SET is support from research studies. For instance, Kurdek (1995) measured SET variables in gay, lesbian and heterosexual couples. The partners who were most committed perceived the most rewards and fewest costs. They also viewed alternatives as relatively unattractive. Clearly, Dom is highly sensitive to the rewards and costs (possibly feelings of guilt) in the relationship. The findings match predictions from SET, confirming the theory's validity in a wide range of romantic partners.

However, applying economic ideas to romantic relationships may be inappropriate. Clark and Mills (2011) argue that *communal relationships* (e.g. romantic partners) involve giving and receiving of rewards without thinking of profit. At the start of a romantic relationship, tallying of exchanges might be viewed with some suspicion and even distaste, as is suggested by Dom's reaction here. This suggests that SET may not provide a suitable explanation for all types of relationships.

Another limitation of SET is that it ignores equity. What matters to most romantic partners is not the exact amount of rewards and costs but the ratio of the two. Satisfied partners perceive that the ratio of rewards to costs is fair. For example, Dom may be gaining more rewards than Steph, but perhaps he is

also experiencing the most costs. This neglect of equity means that SET is a limited explanation that does not account for a significant proportion of research findings.

A further limitation is that SET deals in concepts that are vague and hard to quantify. Unlike in research, real-world rewards/costs are subjective and hard to define because they vary, e.g. 'having your partner's loyalty' is not rewarding for everyone. Also comparison levels are problematic – it is unclear what the values of CL and CLalt need to be before individuals feel dissatisfied. This means SET is difficult to test in a valid way.

A final limitation of SET is the direction of cause and effect may be wrong. SET claims we become dissatisfied *after* we conclude that costs outweigh rewards and/or that alternatives are more attractive (i.e. these factors cause dissatisfaction). But Argyle (1987) suggests that it is only once we become dissatisfied that we monitor costs and rewards or consider alternatives. As long as Dom and Steph are satisfied, they probably won't even notice attractive alternatives. Therefore, considering costs/alternatives is caused by dissatisfaction rather than the reverse.

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1. Equity theory like SET acknowledges the impact of rewards and costs on relationship satisfaction, but criticises SET for ignoring the central role of equity, the perception partners have that the distribution of rewards and costs in the relationship is fair. Walster *et al.*'s equity theory (1978) suggests that partners have a need for equity.

Both *underbenefitting* and *overbenefitting* can lead to dissatisfaction. The underbenefitted partner is likely to be the least satisfied and their feelings may be evident in anger and resentment but the overbenefitted partner is still likely to feel discomfort and shame.

In equity theory, it is not the size or amount of the rewards and costs that matters – it's the ratio of the two to each other. For example, if one partner puts a lot into the relationship but at the same time gets a lot out of it, then that will seem fair enough.

It is argued that the sense of inequity impacts *negatively* on relationships. The greater the perceived inequity, the greater the dissatisfaction and this applies to both the overbenefitted and underbenefitted partner.

The consequences may change over the course of the relationship. For example, at the start it may feel perfectly natural to contribute more than you receive but if this continues as the relationship develops then satisfaction with the relationship may fall.

2. Social exchange theory (SET) assumes that romantic partners act out of self-interest in exchanging rewards and costs and as long as rewards exceed costs and potential alternatives are less attractive than the current relationship, it will continue.

The theory assumes that we measure the profit in a romantic relationship first by the comparison level (CL) – the amount of reward that you believe you deserve to get (based on previous experience, social norms, etc.) We consider a relationship worth pursuing if our CL is high. The second measure of profit considers the comparison level for alternatives (CLalt) where we compare our current profit with the potential rewards and costs from another. SET predicts that we will stay in our current relationship as long as we believe it is more rewarding than the alternatives.

On the other hand, Walster *et al.*'s equity theory (1978) suggests that partners have a need for equity

and as such consider the ratio of rewards and costs. Both *underbenefitting* and *overbenefitting* can lead to dissatisfaction. The underbenefitted partner is likely to be the least satisfied and their feelings may be evident in anger and resentment but the overbenefitted partner is still likely to feel discomfort and shame.

It is argued that the sense of inequity impacts *negatively* on relationships. The greater the perceived inequity, the greater the dissatisfaction and this applies to both the overbenefitted and underbenefitted partner.

3. Aumer-Ryan *et al*. (2007) found couples in an individualist culture (the US) linked satisfaction to equity but partners in a collectivist culture (Jamaica) were most satisfied when they were overbenefitting. This is not predicted by equity theory as it assumes that everyone is motivated to achieve equity. Furthermore, this was true of both men and women, suggesting it is a consistent social-based rather than gender-based difference. So the assumption that equity is key to satisfying relationships in all cultures is not supported and means that the theory is limited in its ability to account for all romantic relationships.

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The consequences may change over the course of the relationship. For example, at the start it may feel perfectly natural to contribute more than you receive but if it continues as the relationship develops then satisfaction with the relationship may fall.

There is some research support for equity theory. For example, Utne *et al*. (1984) found that newly-weds who considered their relationship equitable were more satisfied than those who considered themselves as over- or underbenefitting. So it would seem that profit is not the key issue in judging relationships, rather it is equity. This research supports the central predictions of equity theory supporting its validity as an explanation of romantic relationships.

However, Berg and McQuinn (1986) found that equity did not increase in their longitudinal study of dating couples, as equity theory would predict. The theory does not distinguish between those relationships which ended and those that continued. Variables such as self-disclosure appeared to be more important. This is a strong criticism because it was based on real couples studied over time.

Another limitation is that equity is a culturally-limited concept. Aumer-Ryan *et al*. (2007) found couples in an individualist culture (the US) linked satisfaction to equity but partners in a collectivist culture (Jamaica) were most satisfied when they were overbenefitting. This is not predicted by equity theory as it assumes that everyone is motivated to achieve equity. Furthermore, this was true of both men and

women, suggesting it is a consistent social-based rather than gender-based difference. So the assumption that equity is key to satisfying relationships in all cultures is not supported and means that the theory is limited in its ability to account for all romantic relationships.

Also Huseman *et al*. (1987) suggest that some people are less sensitive to equity than others. Some partners are happy to contribute more than they get (*benevolents*, underbenefitted). Others believe they deserve to be overbenefitted and accept it without feeling distressed or guilty (*entitleds*). This shows that far from being a universal characteristic, a desire for equity is subject to individual differences.

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1. Commitment describes a romantic partner's intention or desire to continue a relationship, reflecting a belief that the relationship has a viable long-term future.

Satisfaction is the extent to which romantic partners feel the rewards of the relationship exceed the costs.

Investment describes the resources associated with a romantic relationship which the partners would lose if the relationship were to end.

2. Social exchange theory (SET) assumes that romantic partners act out of self-interest in exchanging rewards and costs and, for as long as rewards exceed costs and potential alternatives are less attractive than the current relationship, it will continue.

The theory assumes that we measure the profit in a romantic relationship first by the comparison level (CL) – the amount of reward that you believe you deserve to get (based on previous experience, social norms, etc.) We consider a relationship worth pursuing if our CL is high. The second measure of profit considers the comparison level for alternatives (CLalt) where we compare our current profit with the potential rewards and costs from another. SET predicts that we will stay in our current relationship as long as we believe it is more rewarding than the alternatives.

Rusbult's (2011) investment model emphasises the central importance of commitment in relationships, suggesting that it depends on satisfaction and comparison with alternatives which are very similar to elements of SET but also investment size. 'Investment' refers to the extent and importance of the resources associated with the relationship. An investment can be understood as anything we would lose if the relationship were to end – these could be intrinsic (e.g. money and possessions) or extrinsic resources (mutual friendships, etc.). The theory suggests that if we know the state of these factors we can confidently predict the commitment to the relationship.

3. One strength is the supporting evidence is based on self-report techniques which are an appropriate research method since the model is based on subjective judgements about size of investment and alternatives. What matters, according to the model, is the partners' subjective perceptions of their investments. This is a methodological strength because it is a more valid test of the model.

However, Goodfriend and Agnew (2008) argue that there is more to investment than just the resources you have already put into a relationship. Early in a relationship partners make very few actual investments but they do invest in future plans. It is future plans that motivate partners to commit so that the plans can become reality. This means that the original model is a limited explanation as it fails to consider the true complexity of investment.

4. Rusbult's (2011) investment model further developed SET, suggesting that commitment depends on

satisfaction level, comparison with alternatives (CLalt) and investment size. A satisfying relationship is one where the partners are getting more out of the relationship than they expect, given social norms and their previous experiences. Cath agrees with this view suggesting that level of satisfaction determines commitment. Commitment is also determined through investment size according to Rusbult's model; these investments include all of the resources associated with a romantic relationship which would be lost if the relationship ended.

The satisfaction level is the extent to which partners feel the rewards of the romantic relationship exceed the costs, and the comparison with alternatives is a judgement about whether a relationship with a different partner would reduce costs and increase reward. Katie suggests that commitment determines satisfaction whilst Rusbult claims the effect is the other way around, i.e. if investments are increasing and satisfaction is high, then the relationship is likely to continue.

Cath, on the other hand, agrees with Rusbult in that she believes that commitment matters more than satisfaction. This explains why, for example, a dissatisfied partner stays in a relationship when their level of investment is high. They will be willing to work hard to repair problems in the relationship so their investment is not wasted.

One strength is the supporting evidence is based on self-report techniques which are an appropriate research method since the model is based on subjective judgements about size of investment and alternatives. What matters, according to the model, is the partners' subjective perceptions of their investments. This is a methodological strength because it is a more valid test of the model.

Le and Agnew's (2003) review found that satisfaction, comparison with alternatives and investment size all predicted relationship commitment. Where commitment was greatest, relationships were most stable and lasted longest. This chimes with the view of Cath rather than Katie. The support is particularly strong given that the results were true for men and women in either heterosexual or homosexual relationships. This suggests that the claim that these factors are universally important in relationships is valid.

However, much of this research is correlational. No matter how strong the correlation, it does not follow that one variable causes the other. Perhaps the more committed you are to a relationship, the more investment you are willing to make, which reflects the view of Katie rather than of the model. Therefore, it is unclear that the model has uncovered which factors cause commitment.

Rusbult and Martz (1995) found that women who reported making the greatest investment and who had the fewest attractive alternatives were the most likely to return to the partners who had abused them. The concept of satisfaction as important to relationship duration cannot explain this tendency but the level of commitment can. This is closer to Katie's view because it suggests that there are strong influences against letting an investment 'go to waste'. Therefore the model can explain the apparently inexplicable behaviour of staying in an abusive relationship.

However, Goodfriend and Agnew (2008) argue that there is more to investment than just the resources you have already put into a relationship. Early in a relationship, partners make very few actual investments but they do invest in future plans. It is future plans that motivate partners to commit so that the plans can become reality. This means that the original model is a limited explanation as it fails to consider the true complexity of investment.

Page 85

1. The intra-psychic phase starts when someone thinks, 'I can't stand this anymore', indicating a determination that something has to change. A partner becomes dissatisfied with the relationship in its

current form. They then brood on the reasons for this and this will usually focus on their partner's shortcomings. The dissatisfied partner tends to keep this to themselves but may share their thoughts with a trusted friend, weighing up the pros and cons of continuing.

The social phase begins when the dissatisfied partner concludes, 'I mean it'. Once a partner wants to end the relationship then they will seek support particularly from joint friends. These friends may be encouraged to choose a side but others may try and prevent the break-up by acting as a go-between. Once the news is public, though, this is usually the point of no return.

2. The model proposes that the ending of a relationship is not a one-off event but a process that takes time and goes through four distinct phases. Each phase is characterised by a partner reaching a threshold where their perception of the relationship changes. The partner may reassess and decide the relationship isn't so bad, halting the process of breakdown. Or they cross the threshold and move on to the next stage of the model.

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The dyadic phase is initiated by the threshold, 'I would be justified in withdrawing'. Once a partner concludes that they are justified in ending the relationship they have to discuss this with their partner. Dissatisfactions about equity, commitment etc. are aired.

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Finally, the grave dressing phase begins when the partner thinks, 'It's now inevitable'. Once the end becomes inevitable then a suitable story of the relationship and its end is prepared for wider consumption. This is likely to include an attempt to ensure that the storyteller will be judged most favourably and to enable the partner to 'move on'.

3. Duck argued that relationship breakdown is not a single one-off event but a process over time. Breakdown goes through four distinct phases, each one marked by a threshold or a point at which a partner realises their perception of the relationship has changed (e.g. 'I would be justified in withdrawing').

4. The model proposes that the ending of a relationship is not a one-off event but one that goes through four distinct phases, so as the news item suggests it can be regarded as a process which takes time.

Each phase is characterised by a partner reaching a threshold where their perception of the relationship changes. The partner may reassess and decide the relationship isn't so bad, halting the process of breakdown so the theory concurs with the news item's view that relationships can be saved at almost every stage. Or they cross the threshold and move on to the next stage of the model.

The intra-psychic phase starts when someone thinks, 'I can't stand this anymore', indicating a determination that something has to change. A partner becomes dissatisfied with the relationship in its current form. They then brood on the reasons for this and this will usually focus on their partner's shortcomings. The dissatisfied partner tends to keep this to themselves but may share their thoughts

with a trusted friend, weighing up the pros and cons of continuing, so indeed breakdown is not inevitable.

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Rollie and Duck (2006) added a resurrection phase in which ex-partners use what they have learned from the last relationship to prepare for a future one. This refined version also clarifies a point not highlighted in the news item – that movement through the stages is neither linear nor inevitable and partners may return to an earlier phase. This suggests that the original phase model is therefore only a partial explanation of the process of relationship breakdown.

The news item is right to say '…relationships can be saved at almost every stage', and the model suggests that some repair strategies are more effective at one stage than another. For example, in the intra-psychic stage partners could brood more positively. It would be less helpful to encourage brooding if a person had already reached the social phase. This suggests that the model can lead to supportive suggestions that may help people through this difficult time in their lives.

Felmlee (1995) suggests a 'fatal attraction' theory stating that the attributes that partners found attractive at the start of a relationship can often become too much. For example, someone who was attracted to a 'so funny' partner may then decide to end the relationship because the partner 'fails to take life seriously'. This highlights the fact that Duck's model only tells us what happens and not why.

Finally, Moghaddam *et al*. (1993) propose relationships in individualist cultures are mostly voluntary and end quite often, whilst in collectivist cultures relationships are more frequently 'obligatory' and less easy to end. The whole concept of a relationship differs between cultures and therefore the process of relationship breakdown is likely to differ. This is a limitation because it means that the model can only be applied to some cultures and types of relationship.

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1. Sproull and Kiesler (1986) suggests that virtual relationships are less effective due to the lack of nonverbal cues (e.g. physical appearance, emotional responses) – in FtF relationships we rely on these cues. Lack of cues about emotional state (voice and facial expressions) leads to de-individuation. People then feel freer from the constraints of social norms (disinhibition) and this leads to blunt and even aggressive communication and this leads to a reluctance to self-disclose.

Walther's (2011) hyperpersonal model suggests that early self-disclosure means that virtual relationships develop quickly. Such relationships can become more intense and intimate than FtF ones. Self-disclosure differs in virtual relationships because a person can manipulate their online presentation. The sender of

a message can be selective about what and how they present when self-disclosing (both hyperhonest and hyperdishonest). The message receiver gains a positive impression of the sender and gives feedback that reinforces the sender's online self-selected presentation.

2. Since all the research chosen above relates to self-disclosure the above answer would be appropriate here too.

3. There is support for the idea that the absence of gating in virtual relationships is helpful for some people. McKenna and Bargh (2000) studied online communication by shy and socially anxious people. In this group, 71% of the romantic relationships initially formed online survived more than two years, compared to 49% formed offline (Kirkpatrick and Davis 1994). This suggests that shy people do benefit online presumably because the gating that obstructs FtF relationships is absent online.

However, theories need to include the fact that relationships are usually conducted both online and offline. The interaction between people online will influence the interaction in the FtF relationship, including the level and speed of self-disclosure. As such these two kinds of communication have to be considered together and not separately. This suggests that current theories may underestimate the complexity of virtual relationships including the role of gating.

4. Sproull and Kiesler (1986) suggests that CMC relationships are less effective due to the lack of nonverbal cues (e.g. physical appearance, emotional responses) – in FtF relationships we rely on these cues. Lack of cues about emotional state (voice and facial expressions) leads to de-individuation. People then feel freer from the constraints of social norms (disinhibition) and this would at least partly explain the fact that abusive posts do appear in social media. The blunt and even aggressive communication that occurs may lead to a reluctance to self-disclose and even, according to the article, a decision to close down social media accounts.

Walther's (2011) hyperpersonal model suggests that early self-disclosure means that virtual relationships develop quickly. Such relationships can become more intense and intimate. However, the intensity of virtual relationships can also lead to them ending quickly, and this is borne out by the suggestion that people are simply deleting their accounts as an easy way of getting rid of relationships that have turned abusive.

Walther and Tidwell (1995) assert that cues in virtual relationships are simply different from those in FtF ones. They found that there are plenty of cues in virtual relationships but they are just not the non-verbal ones that we recognise in FtF communication. Emoticons and acronyms (e.g. LOL) are considered effective substitutes in virtual relationships for the lack of the usual non-verbal cues, so the proposal that there are reduced cues in virtual relationships appears unfounded. This suggests that there may be no differences in self-disclosure between virtual and FtF relationships, which does not support reduced cues theory.

Whitty and Joinson (2009) found supporting evidence for both hyperhonest and hyperdishonest online disclosures. Questions asked in online discussions tend to be direct, probing and intimate (hyperhonest); dating profiles can be misleading (hyperdishonest). This is quite different from FtF conversations. This is consistent with the prediction of the model that these are distinctive types of disclosure in virtual relationships and this may partly explain the existence of abusive messages.

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two years, compared to 49% formed offline (Kirkpatrick and Davis 1994). This suggests that shy people do benefit online presumably because the gating that obstructs FtF relationships is absent online. This reminds us that not all posts are abusive and there is a positive side to social media.

However, theories need to include the fact that relationships are usually conducted both online and offline. The interaction between people online will influence the interaction in the FtF relationship, including the level and speed of self-disclosure. As such these two kinds of communication have to be considered together and not separately. This suggests that current theories may underestimate the complexity of virtual relationships including the role of gating.

From online e-commerce forms through to Facebook and to online dating, the level of self-disclosure varies considerably. People disclose more in areas that they consider private (e.g. Facebook statuses that will only be seen by 'friends') and disclose less on webforms that involve the collection of data. This means that the validity of theories that consider all virtual relationships in the same way will be limited.

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1. The *Celebrity attitude scale* (CAS) was used by Maltby *et al*. (2006) to identify three levels of parasocial relationship. The first level is 'entertainment-social'. This is the least intense level where celebrities are viewed as sources of entertainment and fuel for social interaction so, for example, a number of people might enjoy chatting about Beyoncé's latest releases and even her pregnancy.

The second level is 'intense-personal', an intermediate level where someone becomes more personally involved with a celebrity and this may include obsessive thoughts. So someone might want to contact Beyoncé and dream about being her best friend, going on holiday together, etc.

The third level is 'borderline-pathological', the strongest level of celebrity worship where fantasies are uncontrollable and behaviour is more extreme. The need to be close to Beyoncé might lead to trying to be where she is and getting jealous, etc.

2. This theory, based on Bowlby's evolutionary explanation, links early difficulties in attachment with difficulties in forming successful relationships later in life. The early relationships are thought to be a template for future ones through the medium of the internal working model. Such difficulties may lead to a preference for parasocial relationships to replace those within one's own social circle, as parasocial relationships do not require the same social skills.

Ainsworth (1979) identified two attachment types associated with unhealthy emotional development: insecure–resistant and insecure–avoidant. Insecure–resistant types are most likely to form parasocial relationships because they want to have their unfulfilled needs met in a relationship where there is no real threat of rejection. Insecure–avoidant types prefer to avoid the pain and rejection of any type of relationship, either social or parasocial.

3. Maltby *et al*. (2005) studied female adolescents who reported an intense-personal relationship with a female celebrity whose body shape they admired. The participants tended to have a poor body image. The researchers speculated that this could be a precursor to development of an eating disorder. This study supports the model because it shows a correlation between the level of parasocial relationship and poor psychological functioning.

However, this and other studies are correlational. It is very unclear whether parasocial involvement causes poor body image or a pre-existing poor body image triggers increasing 'addiction' to celebrity worship. Alternatively a third variable, such as a characteristic of the individual's personality (e.g.

neuroticism), could cause both. This does not help us to prevent the more dangerous and disturbing forms of parasocial relationships. This means the absorption-addiction model is limited in its explanatory power and its application for supporting people whose celebrity worship has become problematic.

4. The *Celebrity attitude scale* (CAS) was used by Maltby *et al*. (2006) to identify three levels of parasocial relationship. First level is 'entertainment-social'. This is the least intense level where celebrities are viewed as sources of entertainment and fuel for social interaction so, in Denise's case, this may have been the level of involvement her parents were happy for Denise to have with Zoella.

The next level is 'intense-personal', where someone becomes more personally involved with a celebrity and this may include obsessive thoughts. Her parents may be worried that Denise has got to this level as she is spending increasing amounts of time on the channel. If her parents recognise that there is a gradual increase in her involvement with Zoella, they may be concerned that she may be heading for the borderline-pathological level, the strongest level of celebrity worship where fantasies are uncontrollable and behaviour is more extreme.

Maltby *et al*. (2005) studied female adolescents who reported an intense-personal relationship with a female celebrity whose body shape they admired. The participants tended to have a poor body image. The researchers speculated that this could be a precursor to development of an eating disorder. This study supports the model because it shows a correlation between the level of parasocial relationship and poor psychological functioning.

There is no evidence that Denise is at risk of an eating disorder. However, as she has only just started secondary school, there may be a possibility that she is struggling to make friends. According to the absorption-addiction model, someone in the absorption phase is seeking fulfilment in celebrity worship to identify with them and their more exciting lives. Denise may be triggered towards a higher level by a stressful life event and starting school would certainly count as one of these.

However, much of the research is correlational. It is very unclear whether parasocial involvement causes poor body image or a pre-existing poor body image triggers increasing 'addiction' to celebrity worship. Alternatively a third variable, such as a characteristic of the individual's personality (e.g. neuroticism), could cause both. This does not help us to prevent the more dangerous and disturbing forms of parasocial relationships. This means the absorption-addiction model is limited in its explanatory power and its application for supporting people such as Denise whose celebrity worship has become problematic.

Perhaps Denise's parasocial involvement with Zoella is linked to attachment experiences in her childhood. In Ainsworth's (1979) terms, Denise may have developed an insecure–resistant attachment as a child. This would make her prone to forming parasocial relationships because she would want to have her unfulfilled needs met in a relationship where there is no real threat of rejection.

A strength of this theory is that is explains why people from many different cultures have a desire for parasocial involvement (which could explain the huge popularity of online celebrities such as Zoella). There is support for this from a study by Dinkha *et al*. (2015) who compared a collectivist culture (Kuwait) with an individualist one (US). The researchers found that people with an insecure–resistant attachment type in both cultures were most likely to form intense parasocial relationships with TV characters. This supports the view that people like Denise may have childhood attachment experiences that disposed them to celebrity worship, regardless of their cultural background.

However, other evidence is not so supportive. For example, McCutcheon *et al*. (2006) found that attachment insecurity was not related to the likelihood of forming a parasocial relationship with a celebrity. Insecurely-attached participants were no more likely to form such relationships than participants with secure attachments. This suggests that Denise's parasocial relationship with Zoella may not have developed as a way of compensating for attachment issues after all.

Chapter 6 Gender

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1. Sex is an innate or biological status (nature) whereas gender is a psychosocial status (nurture). Sex is determined by genetic make-up, namely chromosomes, which influence hormonal and anatomical differences that distinguish males and females whereas gender reflects all the attitudes, behaviours and roles we associate with being masculine or feminine.

2. Sex is an innate or biological status (nature) whereas gender is a psychosocial status (nurture). Sex is determined by genetic make-up, namely chromosomes, which influence hormonal and anatomical differences.

3. Sex-role stereotypes are shared by a culture or social group and consist of expectations regarding how males and females should behave. These expectations are transmitted through a society and reinforced by members of it (e.g. parents, peers, etc.).

Sex-role stereotypes may or may not represent something real. Some expectations have some basis in reality. Research confirms sex-role stereotypes in the media. A study of TV adverts (Furnham and Farragher 2000) found men were more likely to be shown in autonomous roles in professional contexts, whereas women were seen occupying familial roles in domestic settings. This, along with other studies, demonstrates both the existence of sex-role stereotypes and the role the media has in reinforcing them.

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Brian makes sure the car is working properly, puts the bins out and is responsible for the TV remote control. Shirley does most of the housework, including the cooking, and is the one who remembers everybody's birthdays. These behaviours conform to sex-role stereotypes – popular beliefs about what men and women 'do', which are transmitted throughout society and its members.

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1. Androgyny is a *balance* of masculine and feminine characteristics. Everyday understanding relates to appearance as being neither female nor male but psychologically it refers to the presence of a balance of masculine and feminine traits, behaviours and attitudes. It is considered to be a *positive attribute*, associated with psychological well-being and should not be confused with overrepresentation of opposite-sex characteristics.

2. The Bem Sex Role Inventory (BSRI) was developed by asking 50 male and 50 female judges to rate 200 traits in terms of how desirable they were for men and women. The traits that were the highest scorers in each category became the 20 masculine and 20 feminine traits on the scale. 20 neutral

items were also added. The BSRI was then piloted with over 1000 students and the results broadly corresponded with the participants' own description of their gender identity. This resulted in a scale that is able to distinguish masculinity–femininity and androgynous–undifferentiated.

A follow-up study involving a smaller sample of the same students revealed similar scores when the students were tested a month later. This suggests that the scale has high test-retest reliability.

Stereotypical ideas of masculinity and femininity have changed since the BSRI was developed 40 years ago. Also, it was devised by a panel who were all from the US. This suggests that the BSRI may lack temporal validity and be culturally biased and not a suitable measure of gender identity today.

3. One criticism is that the links made between well-being and androgyny as measured by the scale are challenged. Bem emphasised that androgynous individuals are more psychologically healthy because they are more able to deal with scenarios that demand a masculine, feminine or androgynous response. In other words, they are more flexible and able to cope with a variety of situations. However, some researchers (e.g. Adams and Sherer 1985) have argued that people who display a greater proportion of masculine traits are better adjusted than androgynous people as these traits are more highly valued in Western society. This suggests that the BSRI did not take adequate account of the social and cultural context in which it was developed.

4. The Bem Sex Role Inventory (BSRI) was developed by asking 50 male and 50 female judges to rate 200 traits in terms of how desirable they were for men and women. The traits that were the highest scorers in each category became the 20 masculine and 20 feminine traits on the scale. 20 neutral items were also added. The BSRI was then piloted with over 1000 students and the results broadly corresponded with the participants' own description of their gender identity. This resulted in a scale that is able to distinguish masculinity–femininity and androgynous–undifferentiated.

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One strength is that gender identity is measured quantitatively. Bem's numerical approach is useful when it is necessary to quantify a dependent variable but Spence (1984) suggests a qualitative approach may represent gender identity better. One compromise is to combine different scales. For example, the Personal Attribute Questionnaire (PAQ) adds another dimension (instrumentality and expressivity) to Bem's masculinity–femininity dimension. This suggests that quantitative together with qualitative approaches may be useful for studying different aspects of gender identity.

Another strength is that the BSRI has been found to be both valid and reliable. Development of the scale involved 50 males and 50 females judging 200 traits in terms of gender desirability. The top 20 in each case were used. Piloting with 1000 students showed the BSRI reflected their gender identity (validity). A follow-up study involving a smaller sample of the same students produced similar scores when the students were tested a month later, suggesting high test-retest reliability. Together this evidence suggests that the BSRI had a degree of both validity and reliability at the time it was developed.

That said, stereotypical ideas of masculinity and femininity have changed since the BSRI was developed 40 years ago. Also, it was devised by a panel who were all from the US. This suggests that the BSRI may lack temporal validity and be culturally biased and not a suitable measure of gender identity today.

One limitation is people may lack insight into their gender identity. Gender is a social construct which may be more open to interpretation than, say, sex (which is a biological fact). Furthermore, the questionnaire's scoring system is subjective and people's application of the 7-point scale may differ. This suggests that the BSRI may not be a scientific way of assessing gender identity.

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1. Testosterone is a hormone which controls the development of male sex organs before birth. It is present in both sexes and is linked to aggressive behaviour.

Oestrogen is a hormone which controls female sexual characteristics including menstruation. During the menstrual cycle, some women experience heightened emotionality and irritability known as premenstrual tension or premenstrual syndrome.

Oxytocin is typically produced in larger amounts by women than men and stimulates lactation and bonding after birth. It is said that it may explain why females are more interested in intimacy in relationships than men.

2. It is the 23rd pair of chromosomes, made from DNA, which determines the biological sex of a foetus. Under a microscope these chromosomes are either X or Y shape. The female sex chromosome is XX and male is XY.

A baby's sex is determined by whether the sperm that fertilises the egg is an X or a Y chromosome since the X is gained from the ova. The Y chromosome carries a gene called the sex-determining region Y (SRY). This causes the testes to develop and androgens to be produced in a male embryo. Without these androgens, the embryo develops into a female.

There are exceptions, though. About one in 600 males have Klinefelter's syndrome which is characterised by XXY chromosomal structure. Individuals who have this condition are biological males with male anatomy but an additional X chromosome – 10% of cases are identified prenatally but up to 66% may not be aware of it. Diagnosis often comes about accidentally via a medical examination for some unrelated condition.

Furthermore, one in 5000 females have Turner's syndrome which is caused by an absence of one of the two X chromosomes leading to 45 rather than 46 chromosomes. This is characterised as XO chromosomal structure.

3. One strength is that evidence supports the role of testosterone. Wang *et al.* (2000) gave 227 hypogonadal men (men with low levels of testosterone) testosterone therapy for 180 days. Testosterone replacement improved sexual function, libido and mood, and significantly increased muscle strength in the sample. This study suggests that testosterone exerts a powerful and direct influence on male sexual and physical behaviour even in adult males.

However, in another study increasing testosterone levels in healthy young men did not significantly increase either interactional (frequency of sexual intercourse) or non-interactional (libido) components of sexual behaviour (O'Connor *et al.* 2004). This suggests that, in 'normal' adults, additional testosterone has no effects on sexual or aggressive behaviour – though this doesn't challenge the role of testosterone in early development.

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chromosome is XX and male is XY. A baby's sex is determined by whether the sperm that fertilises the egg is an X or a Y chromosome since the X is gained from the ova. The Y chromosome carries a gene called the sex-determining region Y (SRY). This causes the testes to develop and androgens to be produced in a male embryo. Without these androgens the embryo develops into a female. It is likely that Caster has the female chromosomal pattern of XX.

Hormonal explanations of sex and gender focus on the fact that prenatally hormones act upon brain development and cause the development of the reproductive organs. At puberty, a burst of hormonal activity triggers the development of secondary sexual characteristics such as pubic hair. Males and females produce the same hormones but in different concentrations; for example, testosterone plays a key role in male development and aggression. In this case, Caster has much higher levels of testosterone than other women and this could be argued, as in the scenario, to give her an unfair advantage over female runners. On the other hand, oestrogen plays the key role in female development and behaviour, controlling female sexual characteristics including menstruation and it is likely in the case of Caster that oestrogen did not play a full part in her development as a female during the foetal development resulting in her lack of ovaries.

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One limitation is that biological accounts ignore social factors. Hofstede *et al*. (2010) claim that gender roles are more about social factors than biology. Countries that value competition and independence above community (individualist cultures), e.g. US and UK, are more masculine, and masculine traits are more valued than in collectivist cultures. This challenges biological explanations of gender behaviour and suggests social factors may ultimately be more important in shaping gender behaviour and attitudes.

Another limitation is that biological explanations are reductionist. Accounts that reduce gender to the level of chromosomes and hormones exclude alternative explanations. Cognitive explanations include the influence of, for example, schema. Psychodynamic explanations include the importance of childhood experiences. This suggests that gender is more complex than its biological influences alone.

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1. Atypical sex chromosome patterns occur when the chromosomal pattern of XX for females and XY for males develop differently. For example in the case of the one in 600 males who have Klinefelter's syndrome, the pattern of the 23rd chromosomes is XXY. Individuals who have this condition are biological males with male anatomy but an additional X chromosome.

2. Approximately one in 5000 females have Turner's syndrome which is caused by an absence of one of the two X chromosomes leading to 45 rather than 46 chromosomes. The chromosomal pattern is therefore XO rather than the XX usually associated with females.

Individuals with Turner's syndrome have the following physical characteristics: no menstrual cycle as their ovaries fail to develop, leaving them sterile; a broad 'shield' chest and no developing of breasts at puberty; low-set ears and a 'webbed' neck; hips that are not much bigger than the waist.

The syndrome also has an impact on psychological characteristics: a high reading ability but also social immaturity and lower-than-average performance on spatial, visual memory and mathematical tasks.

3. One strength of the research is its contribution to the nature–nurture debate. Comparing both chromosome-typical and atypical individuals highlights psychological and behavioural differences. For example, Turner's syndrome is associated with higher verbal ability. It might be logically inferred that these differences have a biological basis and are a direct result of the abnormal chromosomal structure. This would suggest that innate 'nature' influences have a powerful effect on psychology and behaviour.

However, behavioural differences may result from social influences. Social immaturity in Turner's may be because individuals are treated that way due to their immature appearance. This shows that it could be wrong to assume that psychological and behavioural differences in people with atypical sex chromosome patterns are due to nature.

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The syndrome also has an impact on psychological characteristics: a high reading ability but also social immaturity and lower-than-average performance on spatial, visual memory and mathematical tasks.

About one in 600 males have Klinefelter's syndrome. They are biological males with male anatomy but have an additional X chromosome. 10% of cases are identified prenatally but up to 66% may not be aware of it. It is associated with lack of body hair, health problems, some breast development at puberty (gynaecomastia) and underdevelopment of genitals. Additionally, individuals have poor language skills and are shy as well lacking cognitive skills such as problem-solving.

One strength of the research is its contribution to the nature–nurture debate. Comparing both chromosome-typical and atypical individuals highlights psychological and behavioural differences. For example, Turner's syndrome is associated with higher verbal ability. It might be logically inferred that these differences have a biological basis and are a direct result of the abnormal chromosomal structure. This would suggest that innate 'nature' influences have a powerful effect on psychology and behaviour.

However, behavioural differences may result from social influences. Social immaturity in Turner's may be because individuals are treated that way due to their immature appearance. This shows that it could be wrong to assume that psychological and behavioural differences in people with atypical sex chromosome patterns are due to nature.

Another strength of research is its application to managing the conditions. Continued research into atypical sex chromosome patterns leads to earlier and more accurate diagnoses and positive outcomes. A study of 87 individuals with Klinefelter's syndrome showed that those identified when young benefitted in terms of managing their condition (Herlihy *et al*. 2011). This suggests that increased awareness of these conditions has real-world application.

One limitation is there may be a sampling issue. Generally, only those people who have the most severe symptoms are included in the Klinefelter's database, therefore the typical profile may be distorted. The use of prospective studies show the majority of those with Klinefelter's don't have cognitive or psychological problems, and many are highly successful (Boada *et al*. 2009). This suggests that the typical picture of Klinefelter's (and Turner's) syndrome may be exaggerated.

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1. According to Kohlberg's cognitive-developmental approach, gender identity occurs around 2 years and is when a child is correctly able to identify themselves as a boy or a girl. It is followed by the ability to identify others but there is no sense that it is a permanent state so, for example, a two-and-a-half-year-old boy may be heard to say, 'when I grow up I will be a mummy'.

Gender constancy according to Kohlberg was the final stage of development, around age 6 when children recognise that gender is consistent across time and situations, and this understanding is applied to other people's gender as well as their own. They are no longer fooled by changes in outward appearance; for example, a man in a dress is still a man underneath.

2. Kohlberg's theory takes a cognitive-developmental approach considering both the child's thinking about their gender and the changes in thinking over time. He suggested that transition from stage to stage is gradual rather than sudden.

According to Kohlberg's cognitive-developmental approach the first stage of gender identity occurs around 2 years and is when a child is correctly able to identify themselves as a boy or a girl. It is followed by the ability to identify others but there is no sense that it is a permanent state so, for example, a two-and-a-half-year-old boy may be heard to say, 'when I grow up I will be a mummy'.

Around the age of 4 children acquire gender stability. With this comes the realisation that they will always stay the same gender and that this is an aspect of themselves that remains consistent over time. That said, children of this age cannot apply this logic to other people in other situations. They are often confused by external changes in appearance – they may describe a man who has long hair as a woman.

Gender constancy, according to Kohlberg, was the final stage of development, around age 6 when children recognise that gender is consistent across time and situations, and this understanding is applied to other people's gender as well as their own. They are no longer fooled by changes in outward appearance; for example, a man in a dress is still a man underneath.

3. One limitation is the methodology of supporting studies. Bem (1989) suggests it is no wonder younger children are confused by changes in appearance because our culture demarcates gender through e.g. clothes and hairstyle. Bem found 40% of children aged 3–5 demonstrated constancy if they were first shown a naked photo of the child-to-be identified. This suggests the typical way of testing gender constancy may misrepresent what younger children actually know.

Another limitation is there may be different degrees of constancy. Martin *et al*. (2002) suggest an initial degree of constancy may help children choose friends or seek gender information, for instance, and develops before age 6. A second degree (which develops later) may heighten responsiveness to gender norms under conditions of conflict, such as choosing appropriate clothes or attitudes. This suggests that the acquisition of constancy may be a more gradual process and begins earlier than Kohlberg thought.

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According to Kohlberg's cognitive-developmental approach the first stage of gender identity occurs around 2 years and is when a child is correctly able to identify themselves as a boy or a girl. It is followed by the ability to identify others but there is no sense that it is a permanent state so, for example, a two-and-a-half-year-old boy may be heard to say, 'when I grow up I will be a mummy'. So five-year-old Ryan would have achieved this stage recognising that daddy was male.

The next stage, around the age of 4, is where children acquire gender stability or the realisation that they will always stay the same gender and that this is an aspect of themselves that remains consistent over time. That said, children of this age cannot apply this logic to other people in other situations. This would explain why Ryan thought his dad might have become a 'lady' as he was taking on a role associated typically with females.

In order to recognise that his father could not have changed gender Ryan would need to be a little older (around 6) when, according to Kohlberg, gender constancy occurs as this is where children recognise that gender is consistent across time and situations, and this understanding is applied to other people's gender as well as their own.

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1. Gender schema theory (GST) suggests that understanding of gender changes with age. GST also suggests that children actively structure their own learning of gender.

Gender schema develop after gender identity and contain and organise our knowledge of gender. Schema are mental constructs that develop via experience and are used by us to organise our knowledge and contain what we know in relation to gender and gender-appropriate behaviour.

Martin and Halverson suggest that first a child establishes gender identity (around 2–3 years). The child then begins to look around for further information to develop their schema. Gender-appropriate schema expand over time to include a range of behaviours and personality traits based on stereotypes (e.g. boys liking trucks and girls liking dolls). The schema directs the child's behaviour, (e.g. 'I am a boy so I play with trucks.'). This reinforces existing ideas about gender. By 6 years of age Martin and Halverson suggest children have acquired a rather fixed and stereotypical idea about what is appropriate for their gender.

The theory suggests that children pay more attention to, and have a better understanding of, the schema appropriate to their own gender (ingroup) than those of the opposite sex (outgroup). Ingroup identity bolsters the child's level of self-esteem as there is always a tendency to judge ingroups more positively and at around 8 years of age children develop elaborate schema for both genders.

2. As GST was chosen to answer the question above, the response is equally valid here.

3. One strength is that GST has research support. Martin and Halverson (1983) found that children under 6 were more likely to recall gender-appropriate photographs than gender-inappropriate ones when tested a week later. Children tended to change the gender of the person carrying out the gender-inappropriate activity in the photographs when asked to recall them. This supports gender schema theory which predicts that children under 6 would do this (in contrast with Kohlberg who said this happens in older children).

One limitation is that gender identity probably develops earlier. Zosuls *et al.* (2009) analysed twice-weekly reports from 82 mothers on their children's language from 9–21 months and videotapes of the children at play. Children labelled themselves as a 'boy' or 'girl' (gender identity), on average, at 19 months – almost as soon as they began to communicate. This suggests that Martin and Halverson may have underestimated children's ability to use gender labels for themselves.

However, for Martin and Halverson the ages are averages rather than absolutes. It is the sequence of development that is more important. This suggests that Zosuls *et al*.'s finding is not a fundamental criticism of the theory.

Another strength is that GST can account for cultural differences. Cherry (2019) argues that gender schema not only influence how people process information but also what counts as culturally-appropriate gender behaviour. In societies where perceptions of gender have less rigid boundaries, children are more likely to acquire non-standard gender stereotypes. This contrasts with some other explanations of gender development, such as psychodynamic theory, which suggests gender identity is more driven by unconscious biological urges.

4. Kohlberg's theory takes a cognitive-developmental approach considering both the child's thinking about their gender and the changes in thinking over time. According to Kohlberg's cognitive-

developmental approach, the first stage of gender identity occurs around 2 years when a child is correctly able to identify themselves as a boy or a girl. It is followed by the ability to identify others' gender but there is no sense that it is a permanent state. Around the age of 4 children acquire gender stability. With this comes the realisation that they will always stay the same gender and that this is an aspect of themselves that remains consistent over time. Gender constancy was the final stage of development, around age 6, when children recognise that gender is consistent across time and situations, and this understanding is applied to other people's gender as well as their own.

Kohlberg's stages are heavily influenced by changes in the developing child's brain and subsequent cognitive and intellectual maturation. The biological basis of the theory is supported by Munroe *et al.*'s (1984) cross-cultural evidence of Kohlberg's stages in countries as far afield as Kenya, Samoa and Nepal. This suggests that gender development has a considerable maturational element and universality, supporting a biological approach.

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GST suggests a child establishes gender identity (around 2–3 years) and the gender-appropriate schema expand over time to include a range of behaviours and personality traits based on stereotypes and also direct the child's behaviour. By 6 years of age it is suggested that children have acquired a rather fixed and stereotypical idea about what is appropriate for their gender. Finally, around 8 years of age, children develop elaborate schema for both genders.

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Page 103

1. The Oedipus complex in boys is said to stem from the boy's desire for his mother and hatred of his father. During what Freud referred to as the phallic stage, boys develop incestuous feelings towards their mother and feel a jealous hatred for their father who has what they desire (the mother). Then recognising their father is more powerful, they fear that on discovering their desire for their mother, their father will castrate them.

The Electra complex in girls stems from resentment of the mother. It was used by Jung to describe the conflict that girls experience and Freud called this penis envy. During the phallic stage girls feel competition with their mother for their father's love. Girls also resent their mother because they believe that she is responsible for their lack of a penis.

2. According to Freud the phallic stage (the third of his psychosexual stages) is the key time for gender development. During this stage, at around 3–6 years, boys experience the Oedipus complex. They develop incestuous feelings towards their mother and feel a jealous hatred towards their father who has what they desire (the mother). Then recognising their father is more powerful, they fear that on discovering their desire for their mother, their father will castrate them.

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Resolution of this conflict is through identification with the same-sex parent. For a boy, the conflict between his desires and his castration anxiety is resolved when the boy gives up his love for his mother and begins to identify with his father. Girls acknowledge that they will never have the penis that they desire and so they substitute this with a desire to have their own children and through this they finally identify with their mother and her gender. Identification with the same-sex parent leads to internalisation. Boys adopt the attitudes and values of their father, and girls adopt those of their mother.

3. One strength is there is some support for the Oedipus complex. Freud's theory means that, for boys, 'normal' development depends on being raised by at least one male parent. There is some support for this idea. Rekers and Morey (1990) rated the gender identity of 49 boys (aged 3–11). 75% of those judged 'gender disturbed' had no biological or substitute father living with them. This suggests that being raised with no father may have a negative impact upon gender identity, in line with what Freud's theory would predict.

In contrast, Bos and Sandfort (2010) compared 63 children with lesbian parents and 68 children from 'traditional' families. There were no differences in terms of psychosocial adjustment or gender identity. This contradicts Freud's theory as it suggests that fathers are not necessary for healthy gender identity development.

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One limitation is Freud's theory does not fully explain female development. Freud's idea of penis envy has been criticised as merely reflecting the era he lived and worked in, where males held so much of the power. Horney (1942) argued that in fact men's womb envy was more prominent (a reaction to women's ability to nurture and sustain life). This challenges the idea that female gender development was founded on a desire to want to be like men (an androcentric bias).

Another limitation is that the theory is pseudoscientific. Freud is criticised for the lack of rigour in his methods (case studies). Also many of his concepts (e.g. penis envy) are unconscious and untestable. This makes Freud's theory pseudoscientific (not genuine science) as his key ideas cannot be falsified, i.e. proved wrong through scientific testing. This questions the validity of Freud's theory as it is not based on sound scientific evidence.

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1. Social learning theory (SLT) acknowledges the role of social context in gender development. Gender behaviour is learned from observing others and being reinforced for the imitation of the behaviour. SLT draws attention to the influence of the environment (nurture) in shaping gender development. Influences can include peers, parents, teachers, culture and the media.

Children are reinforced directly for gender-appropriate behaviour. For example, boys may be praised for being active and assertive and punished for being passive or gentle. Differential reinforcement explains why boys and girls learn distinctly different gender behaviours – they are reinforced for different behaviours, which they then reproduce.

There is also indirect reinforcement. Firstly, vicarious reinforcement which means that if the consequences of another person's behaviour are favourable, that behaviour is more likely to be imitated by a child (e.g. if a girl sees her mother being complimented when wearing a pretty dress). On the other hand, vicarious punishment means that if consequences of behaviour are seen to be unfavourable (i.e. punished), behaviour is less likely to be imitated (e.g. if a little boy sees another boy teased for displaying feminine behaviour they are unlikely to copy it).

2. Social learning theory (SLT) focuses on the role of social context and learning in gender development suggesting that gender behaviour is learned from observing others, whereas the psychodynamic approach focuses on the role of conflicts during the phallic stage of psychosexual development.

SLT assumes that gender develops as a result of differential reinforcement in both a direct and vicarious manner, whereas the psychodynamic approach suggests that the process of development necessitates conflict, identification with same-sex parents and finally internalisation of their gender.

3. One strength is that SLT can explain cultural changes. There is more androgyny (less of a clear-cut distinction between stereotypically masculine and feminine behaviour) in many societies today than there was in, say, the 1950s. This shift in social expectations and cultural norms means new forms of gender behaviour are unlikely to be punished and may be reinforced. This shows that social learning not biology can better explain gender behaviour (cognitive factors could also explain cultural changes in terms of schema/stereotypes).

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One strength is supporting evidence for differential reinforcement. Smith and Lloyd (1978) observed adults with babies aged 4–6-months who (irrespective of their actual sex) were dressed half the time in boys' clothes and half the time in girls' clothes. Babies assumed to be boys were encouraged to be adventurous and active and given a hammer-shaped rattle. Babies assumed to be girls were reinforced for passivity, given a doll and praised for being pretty. This suggests that gender-appropriate behaviour is stamped in at an early age through differential reinforcement and supports the SLT explanation of gender development.

However, differential reinforcement may not be the cause of gender differences. Adults may respond to innate gender differences in their own children e.g. encouraging naturally boisterous

boys to be active. This suggests that it is likely that social learning is only part of the explanation of how children acquire gender-related behaviours.

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One limitation is that SLT does not explain the developmental process. The implication of SLT is that modelling of gender-appropriate behaviour can occur at any age, i.e. from birth onwards. It's illogical that children who are, say, two years old learn in the same way as children who are nine (this conflicts with Kohlberg's theory, for instance). This shows that influence of age and maturation (i.e. development) on learning gender concepts is not considered by SLT, and this is a limitation.

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1. Mead's (1935) research on cultural groups in Samoa supported the cultural determination of gender roles. The Arapesh people were gentle and responsive (similar to the stereotype of femininity in industrialised societies). The Mundugumor people were aggressive and hostile (similar to the stereotype of masculinity in industrialised societies). And finally the Tchambuli women were dominant and they organised village life, whilst men were passive and considered to be decorative (the reverse of gender behaviour in industrialised societies).

In contrast, Buss (1995) found consistent mate preferences in 37 countries studied across all continents. In all cultures women sought men offering wealth and resources and men looked for youth and physical attractiveness. Munroe and Munroe (1975) found that in most societies, division of labour is organised along gender lines.

2. Children are most likely to imitate role models who are the same sex as they are and who are engaging in gender-appropriate behaviour. This maximises the chance of gender-appropriate behaviours being reinforced.

Bussey and Bandura (1999) found that the media provides rigid gender stereotypes, for example men are independent, ambitious and advice-givers; women are dependent, unambitious and advice-seekers. Furnham and Farragher (2000) found that men were more likely to be shown in autonomous roles within professional contexts, whereas women were often seen occupying familial roles within domestic settings.

Seeing other people perform gender-appropriate behaviours increases a child's belief that they are capable of such behaviours (= self-efficacy). Mitra *et al.* (2019) found girls in India who watched a programme challenging gender stereotypes were more likely to see themselves as capable of working outside the home than non-viewers.

3. One strength is that the influence of culture has research support. In industrialised cultures, changing expectations of women are a function of their increasingly active role in the workplace (Hofstede 2001). In traditional societies women are still housemakers as a result of social, cultural and religious pressures. This suggests that gender roles are very much determined by the cultural context.

One limitation is that Mead's research has been criticised. Freeman (1983) studied the Samoan people after Mead's study, and claimed Mead had been misled by some of her participants. He also claimed Mead's preconceptions of what she would find had influenced her reading of events (observer bias and ethnocentrism). This suggests that Mead's interpretations may not have been objective and questions the conclusions that she drew.

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One strength of media influence is that it has a theoretical basis. The more time individuals spend 'living' in the media world, the more they believe it reflects the social reality of the 'outside' world (cultivation theory). Bond and Drogos (2014) found a positive correlation between time spent watching *Jersey Shore* and permissive attitudes towards casual sex (other factors controlled). This

suggests the media 'cultivates' perception of reality and this affects gender behaviour (e.g. sexual behaviour).

One limitation is there may not be a causal relationship. Durkin (1985) argues that even very young children are not passive recipients of media messages, and family norms are a bigger influence. If media representations confirm gender roles held by the family, norms are reinforced in a child's mind. If not, then they are likely to be rejected. This suggests that media influences are secondary to other influences, such as family.

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1. Gender dysphoria occurs when there is a mismatch between a person's biological sex and the gender they feel they are. DSM-5 specifically excludes atypical gender conditions with a biological basis (e.g. Klinefelter's syndrome).

2. One biological explanation is the genetic explanation. Coolidge *et al*. (2002) studied 157 twin pairs (MZ and DZ) and suggest that 62% of these cases could be accounted for by genetic variance. Heylens *et al*. (2012) found that nine (39%) of their sample of MZ twins were concordant for GD, but none of the DZs were.

Social constructionism suggests that confusion (dysphoria) arises because people have to select a gender. Therefore dysphoria is not pathological (a mental disorder) but due to social factors. For example, McClintock (2015) studied biological males in New Guinea born with female genitals due to a genetic condition. At puberty genitals change and the individuals are accepted as kwolu-aatmwol (females-then-males). However, after contact with the West kwolu-aatmwol are seen as abnormal instead of normal.

3. One limitation is that brain sex theory assumptions have been challenged. Hulshoff Pol *et al.* (2006) scanned transgender individuals' brains during hormone treatment and found the size of the bed nucleus of the stria terminalis (BST) had changed significantly. Kruijver *et al.* and Zhou *et al.* examined the BST post-mortem and after transgender individuals had received hormones during gender reassignment treatment. This suggests that differences in the BST may have been an effect of hormone therapy, rather than the cause of gender dysphoria.

One strength is that there may be other brain differences. Rametti *et al*. (2011) analysed brains of both male and female transgender individuals, crucially before they began hormone treatment as part of gender reassignment. In most cases, the distribution of white matter corresponded more closely to the gender the individuals identified themselves as being rather than their biological sex. This suggests that there are early differences in the brains of transgender individuals.

4. The bed nucleus of the stria terminalis (BST) is involved in emotional responses and male sexual behaviour in rats. This area is larger in men than women and is female-sized in transgender females (Kruijver *et al.* 2000). People with gender dysphoria (GD) have a BST which is the size of the sex they identify with, not the size of their biological sex. This fits with people who are transgender who feel, from early childhood, that they were born the wrong sex (Zhou *et al.* 1995).

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One strength is evidence of more than two gender roles. Some cultures recognise more than two genders, e.g. fa'afafine of Samoa, challenging male versus female. Increasing numbers of people now describe themselves as non-binary, showing cultural changes now match the lived experience of many. This suggests that gender identity (and dysphoria) is best seen as a social construction than a biological fact.

Some people with GD will decide to have gender reassignment surgery. However, GD may not continue through to adulthood – only 12% of GD girls were still GD at 24 years old (Drummond *et al.* 2008). This suggests that gender reassignment surgery before the age of consent must be very carefully managed with appropriate support and safeguards.

Chapter 7 Cognition and development

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1. Piaget referred to his idea of units of knowledge as 'schema'. Each schema contains our understanding of an object, person or idea. Schema become increasingly complex during development as we experience those objects, etc., more and acquire more information about each object or idea.

Equilibration takes place when we have encountered new information and built it into our understanding of a topic, either by assimilating it into an existing schema or accommodating to it by forming a new one. Disequilibrium drives development as it is an unpleasant experience. Once everything is balanced again we reach a state of equilibration.

2. Assimilation takes place when we understand a new experience and remove disequilibrium through assimilating information into our existing schema, whereas accommodation takes place in response to dramatically new experiences and involves either radically changing current schema or forming new ones. For example, a child in a family with dogs can adapt to the existence of different dog breeds by assimilating them into their dog schema (assimilation) whereas on meeting a cat they may initially think of cats as dogs but then accommodate to the existence of a separate species called cats. This will involve altering the animal/pet schema to include cats and forming a new 'cat' schema.

3. Piaget asserts that maturation causes changes in the way children think not just how much they know. The theory focuses on what motivates the development and how knowledge develops. He suggests that cognitive development includes the construction of increasingly detailed schema which help us organise our knowledge. The few innate schema are built on in infancy and as adults we build schema for people, objects, physical actions and for more abstract ideas like justice or morality.

We are motivated to learn when we experience disequilibrium. For example, when a child cannot make sense of their world because existing schema are insufficient, they are motivated to reduce the discomfort to a state of equilibration. They can do this through two key processes: the first is assimilation when the new experiences can be understood with adjustment to existing schema. Secondly, when this is not possible because the experience is radically different from the existing schema, then accommodation involves the creation of whole new schema or wholesale changes to existing ones.

For example, a child with pet cats who has not come across dogs (has no dog schema) on meeting a dog will initially try to incorporate the dog into their cat schema. When the dog acts rather differently (e.g. sitting when told to, barking, etc.), then the child needs to do something more dramatic than assimilation. The child will accommodate by forming a separate dog schema. Both development and equilibration have taken place.

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A strength of Piaget's theory is support from research. Howe *et al.* (1992) put 9–12-year-olds in groups to discuss how objects move down a slope. They found that the level of children's knowledge and understanding increased after the discussion. This means that the children formed their own individual mental representations of the topic – as Piaget would have predicted.

Another strength is that Piaget's ideas have revolutionised teaching, ensuring that activity-oriented classrooms allow children to learn in a more natural way as children actively engage in tasks that allow them to construct their own understanding of the curriculum. At A level, discovery learning may be 'flipped' lessons where students read up on content, forming their own basic mental representation of the topic prior to teaching. This shows how Piaget-inspired approaches may facilitate the development of individual mental representations of the world.

On the other hand, although Piaget's theory has been influential, there is little firm evidence that discovery learning is more effective than direct teaching. Lazonder and Harmsen (2016) reviewed the evidence and concluded that input from others, rather than discovery *per se*, is the crucial element. Therefore discovery learning is less effective than we would expect if Piaget's theory was correct.

However, whilst Piaget recognised teachers are important for setting up discovery situations for children, other theories suggest that the role of others in learning is more central. For example, Vygotsky argued that learning is more of a social process and more advanced learning is possible only with the help of experts or peers. This suggests that Piaget's theory is somewhat limited in its explanation of the cognitive development process.

Furthermore, Piaget believed that disequilibrium was the motivating factor in cognitive development but not all children are equally motivated to remove disequilibrium. Piaget studied children from middle-class families who may have been more motivated to learn than other children. If the role of equilibration is doubted, then as a central part of his explanation this weakens the validity of his theory.

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1. Object permanence refers to the ability to realise that an object still exists when it passes out of the visual field. So, for example, when a baby's rattle gets lost over the side of a high chair it ceases to exist in their view and they lose interest. Piaget believed that the ability to understand that it continues to exist despite not being seen appears at around eight months of age.

Conservation is the name given to the ability to realise that quantity remains the same even when the appearance of an object or group of objects changes. For example, the volume of liquid stays the same whether it is in a short fat or long thin glass. Piaget believed that this skill developed during the pre-operational stage.

2. During the sensorimotor stage (approximately 0–2 years) a baby's focus is on physical sensations and the basic co-ordination between what they see and their body movement. During this stage, they also come to understand that other people are separate objects, and they acquire some basic language.

A key skill developed during this stage is that of object permanence (the understanding that objects still exist when they are out of sight). Before 8 months, children immediately switch their attention away from an object once it is out of sight but after 8 months children continue to look for it. At that point in time it is assumed that children then understand that objects continue to exist when removed from view.

3. Piaget's method to demonstrate development of number conservation in the pre-operational child involved two rows of eight counters each (with gaps) placed side by side. As the rows were of equal length, even young children correctly reasoned that each row must have the same number of counters. But then Piaget pushed the counters in one row closer together, shortening this row in relation to the other. Young children in the pre-operational stage who could not conserve number said there were fewer numbers in that row.

4. Piaget suggested that there were four stages of development each with a different level of reasoning ability. Movement through the stages is said to occur through schema and disequilibrium/equilibration and he proposed that all children develop through the same sequence of stages.

During the sensorimotor stage (approximately 0–2 years) a baby's focus is on physical sensations and the basic co-ordination between what they see and their body movement. Before 8 months, children immediately switch their attention away from an object once it is out of sight but after 8 months children continue to look for it. This suggests that children then understand that objects continue to exist and that they have developed object permanence.

During the pre-operational stage (2–7 years) children are said to be egocentric (unable to perceive matters from a point of view other than their own) as tested by Piaget and Inhelder's (1956) three mountains task. Furthermore, they have no sense of class inclusion, for example younger children cannot simultaneously see a dog as both a member of the dog class and the animal class.

At the start of the concrete operations stage (at around 7 years), children have mastered conservation, which is an understanding of the fact that quantity remains constant even when the appearance changes and are improving on egocentrism and class inclusion. They continue to have

some reasoning problems though and can only reason/operate on physical objects in their presence (concrete operations).

Piaget suggested that abstract reasoning develops during the formal operations stage (11+ years). Children can now focus on the form of an argument and not be distracted by its content.

A limitation of Piaget's stage theory is evidence that challenges his methods. Piaget's method may have led the children to think something must have changed (or why would the researcher ask the question?). McGarrigle and Donaldson (1974) found that in a conservation of number task, if the counters were moved accidentally by a 'naughty teddy', 72% of children under 7 correctly said the number was the same as before. This suggests that Piaget underestimated the conservation ability of children aged 4–6 years as children of this age can conserve, as long as they are not put off by the way they are questioned.

Another limitation is more evidence challenging Piaget's findings concerning class inclusion. Siegler and Svetina (2006) found that when 5-year-olds received feedback that pointed out subsets, they did develop an understanding of class inclusion contrary to Piaget's belief that sufficient intellectual development for class inclusion was not possible until around 7 years. This again suggests that Piaget underestimates children's cognitive abilities and calls into question the validity of his stages.

The assertions about egocentrism are not supported either. Hughes (1975) found that even at 3½ years a child could position a boy doll in a model building with two intersecting walls so that the doll could not be seen by a policeman doll. They could do this 90% of the time. 4-year-olds could do this 90% of the time when there were two police officers to hide from. This again suggests the manner of Piaget's studies and tasks led him to underestimate children's intellectual abilities.

However, it is important to note that these criticisms boil down simply to Piaget's claims about the ages at which children pass through stages. For example, Hughes argues that children can decentre at a younger age than Piaget thought, but decentring as a cognitive ability that develops through stages is not in question. Therefore the core principles of Piaget's stages stand, although the methods he used meant the timings were inaccurate.

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1. The zone of proximal development (ZPD) refers to the gap between a child's current level of development, defined by the cognitive tasks they can perform unaided, and what they can potentially do with the right help from a more expert other.

Scaffolding is the process of helping a learner cross the ZPD and advance as much as they can, given their stage of development. Typically, the level of help given in scaffolding declines as the learner crosses the ZPD.

2. Whilst Vygotsky agreed with Piaget that children develop reasoning skills sequentially, he believed that this process was mainly dependent on social processes. He claimed that knowledge is first intermental (between someone more expert and someone less expert) and then intramental (within the individual). He went on to suggest that cultural differences in learning could be explained through differing experiences because reasoning abilities are acquired via contact with those around us and children pick up the mental 'tools' that are most important for life from the world they live in.

Vygotsky referred to the ZPD as the gap between what a child knows or can do alone, and what the child is capable of, following interaction with someone more expert. The role of a teacher was to

guide the child through this gap. The most advanced (formal) reasoning can only be achieved with the help of experts, not simply through exploration.

Experts use scaffolding to help learners cross the ZPD and advance as much as they can, given their stage of development. Typically, the level of help given in scaffolding declines as the learner crosses the ZPD. Progressive scaffolding strategies include demonstration (e.g. mother draws an object with child) all the way up to general prompts (e.g. mother says, 'Now draw something else.').

3. Wood *et al*. (1976) observed children's learning with adults and identified five aspects to scaffolding which enable learners to traverse Vygotsky's ZPD. They concluded that these were ways in which an adult can help a child better understand and perform a task. They also noted the strategies that the 'experts' (suggested by Vygotsky to be essential to more complex development) use when scaffolding, concluding that the level of help given in scaffolding declines from 'demonstration' (most help) to 'general prompts' (least help). An adult is more likely to use a high level of help strategies when first helping, then gradually withdraws the level of help as the child grasps the task. The progressive strategies are:
• Demonstration – e.g. adult draws an object with crayons.
• Preparation – e.g. adult helps child grasp a crayon.
• Indication of materials – e.g. adult points at crayon.
• Specific verbal instructions – e.g. adult says 'What about the green crayon?'.
• General prompts – e.g. adult says 'Now draw something else'.

4. Whilst Vygotsky agreed with Piaget that children develop reasoning skills sequentially, he believed that this process was mainly dependent on social processes. He claimed that knowledge is first intermental (between someone more expert and someone less expert) and then intramental (within the individual). This 'expert' does not have to be an adult and can just as easily be an expert peer as Uriah has observed.

Vygotsky went on to suggest that cultural differences in learning could be explained through differing experiences because reasoning abilities are acquired via contact with those around us and children pick up the mental 'tools' that are most important for life from the world they live in, once again children can acquire these from other children.

He referred to the ZPD as the gap between what a child knows or can do alone, and what the child is capable of, following interaction with someone more expert. A 'teacher' or more expert peer as suggested by Uriah can help guide other children through this gap through scaffolding. The most advanced (formal) reasoning can only be achieved with the help of experts, not simply through exploration which is borne out by Uriah's personal observations.

A strength of Vygotsky's theory is research support for the ZPD. Roazzi and Bryant (1998) found that 4–5-year-olds performed better on a 'number of sweets' challenge when working with peers (who offered support on estimating) rather than alone. This demonstrates that children can develop more advanced reasoning skills when working with more expert people and supports both the validity of the ZPD as a developmental concept and Uriah's observations.

There is also research support for Vygotsky's concept of scaffolding. Conner and Cross (2003) found in observations of children at intervals between the ages of 16 and 54 months that mothers used less direct intervention as children developed. This supports the idea that the level of help given by an expert partner declines over time as suggested by the process of scaffolding and the process by which children move through their ZPD.

Another strength is real-world application of the theory. Educational techniques such as group work, peer tutoring and individual adult assistance are all based on Vygotsky's ideas and are increasingly used in the 21st century. Van Keer and Verhaeghe (2005) found that 7-year-olds tutored by 10-year-olds, in addition to their whole-class teaching, progressed further in reading than a control group who only had class teaching. This suggests that Vygotsky was correct in assuming that more able people, even if they are essentially peers, can enhance development and learning as suggested by Uriah.

On the other hand, although Vygotsky's ideas about social interaction have found real-world application this is not universal. Liu and Matthews (2005) point out that classes of up to 50 children in China learn very effectively in lecture-style classrooms with little interaction with peers or teachers. Therefore Vygotsky may have overestimated the importance of scaffolding on learning.

There is evidence to support Vygotsky's idea that interaction with a more experienced other can enhance learning (e.g. Conner and Cross). However, if Vygotsky was right about interactive learning, we would expect children learning together to learn the same things, however it varies a lot. This means that Piaget might have described learning better than Vygotsky, in spite of Vygotsky's useful emphasis on interaction.

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1. Knowledge of the physical world refers to the extent to which we understand how the physical world works. Baillargeon's violation of expectation research aims to investigate this understanding. An example of this knowledge is object permanence, the understanding that objects continue to exist when they leave the visual field. There is a debate concerning the age at which children develop this kind of knowledge.

2. Baillargeon and Graber (1987) showed 24 infants, aged 5–6 months, a tall and a short rabbit pass behind a screen with a window. In the expected condition the tall rabbit can be seen passing the window but the short one cannot. In the unexpected condition neither rabbit appeared at the window. Measurements were taken as to how long the infants spent looking at each condition.

It was found that the infants looked for an average of 33.07 seconds at the unexpected event as compared to 25.11 seconds in the expected condition. The researchers interpreted this as meaning that the infants were surprised at the unexpected condition. For them to be surprised it follows that they must have known that the tall rabbit should have reappeared at the window. This demonstrates an understanding of object permanence.

3. There were always criticisms of Piaget's methods for studying children's knowledge of the physical world and he assumed that when a baby shifted attention away from an out-of-sight object this meant that the child no longer knew it existed. However, the child might have shifted attention simply because they lost interest. The VOE method is probably a better method for investigating whether a child has some understanding of the permanent nature of objects because it eliminates this confounding variable and means that the VOE method has better validity than some alternatives.

However, whilst Baillargeon's research clearly shows that infants look for significantly longer at some scenes than others, what they show is that babies behave as we might expect them to if they understood the physical world. So, we are assuming how a baby might behave in response to a violation of expectations and they might not actually look at unexpected events for longer than expected events. Also, although infants look for different lengths of time at different events this

merely means that they see them as different but there could be any number of reasons why they find one scene more interesting than another. This means that the VOE method may not be an entirely valid way of investigating infant understanding of the physical world.

4. Baillargeon suggested that infants in the sensorimotor stage may have a better-developed understanding of the physical world than proposed by Piaget. For example, Piaget suggested that infants did not reach for a hidden object because they lacked an understanding of object permanence but Baillargeon suggested it might be because they didn't have the necessary motor skills.

Baillargeon considered that the methods used by Piaget led him to underestimate children's abilities and she developed the violation of expectation (VOE) technique to compare infant reactions to an expected and an unexpected event and thus could make inferences about the infant's cognitive abilities.

Furthermore, Baillargeon *et al*. (2012) proposed that we are born with a physical reasoning system (PRS) to enable us to learn details of the physical world more easily. This primitive awareness becomes more sophisticated as we learn from experience. Baillargeon referred to object persistence (like Piaget's object permanence) and claimed that this was one such ability. PRS means infants are predisposed to attend and learn from unexpected events. An innate PRS means that, when an infant is shown an unexpected occurrence (tall rabbit event where tall rabbit does not appear), it draws their attention. This will help them to develop their understanding of the physical world.

A strength is that, whilst Piaget assumed that when an infant failed to search for a hidden object the infant thought it no longer existed, the use of the VOE technique enables us to control for the fact they may simply have lost interest. This means that Baillargeon's explanation provides a more valid account of infant abilities than Piagetian theories.

On the other hand, Piaget himself pointed out that acting in accordance with a principle is not the same as understanding it. Even if babies recognise and give more attention to unexpected events, this doesn't mean they understand them. To understand something means to think about it consciously and apply reasoning about different aspects of the world. Therefore, even though babies do appear to respond to unexpected conditions as Baillargeon suggested, this may not represent a change in their cognitive abilities.

A methodological issue is that babies' responses may not be to the unexpectedness of the event. All VOE shows is that babies find certain events more interesting. We are inferring a link between this response and object permanence. Actually, the different levels of interest in the two different events may be for any number of reasons. This means that the VOE method may not be a valid way to study a very young child's understanding of the physical world.

Another strength is that the PRS can explain why physical understanding is universal. We all have a good understanding of the physical world regardless of culture and experience. So if we drop a key ring we all understand that it will fall to the ground. This universal understanding suggests that a basic understanding of the physical world is innate. Otherwise we would expect cultural and individual differences. This means that Baillargeon's PRS appears to be a good account of infant cognitive abilities.

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1. Social cognition describes the mental processes we make use of when engaged in social interaction. For example, we make decisions on how to behave based on our understanding of a social situation. One of the skills this requires is perspective-taking, which is the ability to appreciate a social situation from the perspective (point of view) of other people. This cognitive ability underlies much of our normal social interaction and both the understanding and the decision-making are cognitive processes.

2. Selman (1976) proposed five stages of social cognitive development suggesting that development through these stages is based on both maturity and experience.

In stage 0 (3–6 years, egocentric) the child cannot reliably distinguish between their own emotions and those of others. They can generally identify emotional states in others but do not understand what social behaviour might have caused them. In Stage 1 (6–8 years, social-informational) they start to be able to tell the difference between their own point of view and that of others, but they can usually focus on only one of these perspectives.

It is in Stage 2 (8–10 years, self-reflective) that the child can put themselves in the position of another person and fully appreciate their perspective. They still cannot take on more than one viewpoint at a time until Stage 3 (10–12 years, mutual). In the final stage, Stage 4 (12+ years, social and conventional system), they recognise that sometimes understanding others' viewpoints is not enough to allow people to reach agreement and that social conventions are needed to keep order.

3. Selman (1971) looked at changes that occurred with age in children's responses to scenarios in which they were asked to take the role of different people in a social situation – 30 boys and 30 girls took part in the study, 20 aged four, 20 aged five and 20 aged six. All were individually given a task designed to measure perspective-taking ability. This involved asking them how each person felt in various scenarios. For example, one scenario featured a child called Holly who has promised her father she will no longer climb trees, but who then comes across her friend whose kitten is stuck up a tree. The task was to describe and explain how each person would feel if Holly did or did not climb the tree to rescue the kitten.

4. Selman (1971) looked at changes that occurred with age in children's responses to scenarios in which they were asked to take the role of different people in a social situation. Based on children's typical responses to perspective-taking scenarios at different ages, Selman (1976) proposed five stages of social cognitive development suggesting that development through these stages is based on both maturity and experience.

In stage 0 (3–6 years, egocentric) the child cannot reliably distinguish between their own emotions and those of others. They can generally identify emotional states in others but do not understand what social behaviour might have caused them. In Stage 1 (6–8 years, social-informational) they start to be able to tell the difference between their own point of view and that of others, but they can usually focus on only one of these perspectives.

It is in Stage 2 (8–10 years, self-reflective) that the child can put themselves in the position of another person and fully appreciate their perspective. They still cannot take on more than one viewpoint at a time until Stage 3 (10–12 years, mutual). In the final stage, Stage 4 (12+ years, social and conventional system), they recognise that sometimes understanding others' viewpoints is not enough to allow people to reach agreement and that social conventions are needed to keep order.

A strength is support from Selman's (1971) own research. He looked at changes that occurred with age in children's responses to scenarios in which they were asked to take the role of different people in a social situation. Boys and girls aged 4, 5 and 6 years were individually given a task designed to measure perspective-taking ability. This involved asking them how each person felt in various scenarios. For example, one scenario featured a child called Holly who has promised her father she will no longer climb trees, but who then comes across her friend whose kitten is stuck up a tree. The task was to describe and explain how each person would feel if Holly did or did not climb the tree to rescue the kitten. The findings revealed a number of distinct levels of perspective-taking, as outlined above. These correlated with age, showing a clear developmental sequence as predicted by Selman's theory.

This was further supported by longitudinal follow-up studies which confirm that perspective-taking develops with age. This is a strength of the levels idea generally, particularly as it is supported by a range of evidence.

However, the evidence is mixed as to how important perspective-taking is. Buijzen and Valkenburg (2008) found a negative correlation between age, perspective-taking and coercive behaviour, suggesting that perspective-taking is important in developing prosocial behaviour. However, Gasser and Keller (2009) found that bullies displayed no difficulties in perspective-taking. This suggests that perspective-taking may not be a key element in healthy social development.

However, critics point out Selman's theory looks only at cognitive factors whereas children's social development involves more than their developing cognitive abilities. For example, internal factors (e.g. empathy) and external factors (e.g. family atmosphere) are important and it is likely that social development is due to a combination of these. This means that Selman's approach to explaining perspective-taking is too narrow.

Wu and Keysar (2007) found that young adult Chinese participants did significantly better in perspective-taking than matched Americans. This indicates that the development of perspective-taking is influenced by sociocultural inputs and not just maturity. However, Selman believed that his stages of perspective-taking were based primarily on cognitive maturity and so were universal (Vassallo 2017). This suggests there may be an interaction between nurture and nature, and perhaps Selman wrongly downplayed this.

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1. The Sally–Anne study was Baron-Cohen *et al*.'s (1985) method of studying theory of mind.

Children were told a story involving two dolls, Sally and Anne. Sally places a marble in her basket, but when Sally is not looking Anne moves the marble to her box. The task is to work out where Sally will look for her marble. Understanding that Sally does not know that Anne has moved the marble requires an understanding of Sally's false belief about where the marble is.

Baron-Cohen *et al*. (1985) recruited 20 high-functioning children diagnosed with autism spectrum disorder (ASD) and control groups of 14 children with Down Syndrome and 27 without a diagnosis and individually administered the Sally–Anne test to them.

They found that 85% of children in the control groups correctly identified where Sally would look for her marble suggesting that they had the social cognition skill. However, only four of the children in

the ASD group (20%) could answer this correctly. This dramatic difference demonstrated that ASD involves a ToM deficit and a problem with social cognition.

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They found that 85% of children in the control groups correctly identified where Sally would look for her marble suggesting that they had the social cognition skill. However, only four of the children in the ASD group (20%) could answer this correctly. This dramatic difference demonstrated that ASD involves a ToM deficit and a problem with social cognition.

Older children with ASD can succeed on false belief tasks, despite problems with empathy, social communication, raising questions as to whether ASD can be explained by ToM deficits.

Baron-Cohen *et al*. (1997) developed the Eyes Task as a more challenging test of ToM and found that adults with high-functioning ASD struggled on this task. This supports the idea that ToM deficits might be the cause of ASD.

3. One limitation is the reliance on false belief tasks to test the theory. Bloom and German (2000) suggest that false belief tasks require other cognitive abilities (e.g. visual memory) as well as ToM, so 'failure' may be due to a memory deficit and not ToM deficits. Furthermore, children who cannot perform well on false belief tasks still enjoy pretend-play, which requires a ToM. This means that false belief tasks may not really measure ToM, meaning ToM lacks evidence.

4. Theory of mind (ToM) is a personal theory or belief about what other people know, are feeling or thinking and is tested differently according to age. Meltzoff (1988) allowed children to observe adults placing beads into a jar. In the experimental condition adults appeared to struggle with this and dropped the beads, whereas in the control condition the adults successfully placed the beads in the jar. In both conditions toddlers successfully placed the beads in the jar, suggesting that they were imitating what the adult intended to do rather than what they actually did, demonstrating ToM.

Baron-Cohen *et al*. (1985) recruited 20 high-functioning children diagnosed with ASD and control groups of 14 children with Down syndrome and 27 without a diagnosis and individually administered the Sally–Anne test to them (a false belief task developed to test whether children can understand that people can believe something that is not true).

They found that 85% of children in the control groups correctly identified where Sally would look for her marble, suggesting that they had the social cognition skill. However, only four of the children in the ASD group (20%) could answer this correctly. This dramatic difference demonstrated that ASD involves a ToM deficit and a problem with social cognition and it has also been suggested that ToM deficits might in fact be a complete explanation of ASD.

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'failure' may be due to a memory deficit and not ToM deficits. Furthermore, children who cannot perform well on false belief tasks still enjoy pretend-play, which requires a ToM. This means that false belief tasks may not really measure ToM, meaning ToM lacks evidence.
One strength of ToM research is its application to understanding ASD. People with ASD find ToM tests difficult which shows they do have problems understanding what others think. This in turn explains why people with ASD find social interaction difficult – because they don't pick up cues for what others are thinking and feeling. This means that ToM research has real-world relevance.

However, ToM does not provide a complete explanation for ASD. Not everyone with ASD experiences ToM problems, and ToM problems are not limited to people with ASD (Tager-Flusberg 2007). This means that there must be other factors that are involved in ASD, and the association between ASD and ToM is not as strong as first believed.

Perner (2002) suggests that ToM develops in line with other cognitive abilities (domain-general). A Piagetian view such as this suggests ToM is based on an innate ability which develops with age. However, Astington (1998) takes a more Vygotskian approach, focusing on the social influences that affect ToM and suggesting we internalise our ToM during early interactions with adults. This is supported by Liu *et al*. (2004) who also found that ToM appeared at different ages in different cultures. This means that the rate of development is modified by the social environment – nature and nurture.

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1. The mirror neuron system consists of special brain cells called mirror neurons distributed in several areas of the brain. Mirror neurons are unique because they fire both in response to personal action and action on the part of others. These special neurons may be involved in social cognition, allowing us to interpret intention and emotion in others.

2. Rizzolatti *et al*. (2002) noted that the same area of a monkey's motor cortex became activated when the monkeys observed a researcher reaching for his lunch and when the monkey itself reached for food. The researchers later confirmed that it was the same brain cells firing.

Gallese and Goldman (1998) suggested that mirror neurons respond not just to observed actions but to intentions behind behaviour and that we need to understand the intentions of others to interact socially. The research on mirror neurons suggests we simulate the action of others in our own brains and thus experience their intentions through our mirror neurons.

Ramachandran (2011) suggested that mirror neurons have shaped human evolution, how we have evolved as a social species. Furthermore, their research suggested that mirror neurons enable us to understand intention, emotion and perspective. These are fundamental requirements for living in large groups with the complex social roles and rules that characterise human culture.

3. A strength is research that supports the link between ASD and mirror neuron deficits by finding a smaller thickness of the pars opercularis in participants with ASD (Hadjikhani 2007). Other studies using fMRI have shown lower activity in brain areas associated with mirror neurons in participants with ASD. This suggests a cause of ASD may lie in the mirror neuron system. However, a systematic review of studies by Hamilton (2013) concluded that evidence was highly inconsistent and results hard to interpret. This means there may not be a link between ASD and mirror neuron activity after all.

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Ramachandran (2011) suggested that mirror neurons have shaped human evolution, how we have evolved as a social species. Furthermore, their research suggested that mirror neurons enable us to understand intention, emotion and perspective. These are fundamental requirements for living in large groups with the complex social roles and rules that characterise human culture.

Support for the role of mirror neurons comes from research by Haker *et al*. (2012). They demonstrated via fMRI scans that Brodmann's Area 9 (a part of the brain rich in mirror neurons) is involved in contagious yawning. Mouras *et al.* (2008) found when men watched heterosexual pornography, activity in the pars opercularis was seen immediately before sexual arousal. This suggests that mirror neurons produced perspective-taking, making the pornography arousing. Both studies support the importance of mirror neurons in social cognition through activation when empathy or perspective-taking take place.

However, evidence for mirror neuron activity usually comes from brain scanning. This technique identifies activity levels in regions of the brain but cannot measure activity in individual brain cells. Inserting electrodes is the only way of measuring activity at a cellular level and is not ethically possible in humans. Therefore there is no gold standard for measuring mirror neuron activity in humans (Bekkali *et al.* 2019), and no direct evidence for mirror neuron activity in humans.

A strength is research that supports the link between ASD and mirror neuron deficits by finding a smaller thickness of the pars opercularis in participants with ASD (Hadjikhani 2007). Other studies using fMRI have shown lower activity in brain areas associated with mirror neurons in participants with ASD. This suggests a cause of ASD may lie in the mirror neuron system. However, a systematic review of studies by Hamilton (2013) concluded that evidence was highly inconsistent and results hard to interpret. This means there may not be a link between ASD and mirror neuron activity after all.

Some research shows that mirror neurons are involved in physical perspective-taking. Maranesi *et al*. (2017) found that specific mirror neurons in monkeys' motor cortex fired according to the position and angle from which experimenters gestured. This shows that physical perspective is encoded by mirror neurons, consistent with Piaget's view that physical and social perspective-taking are part of the same phenomenon.

On the other hand, a recent review by Bekkali *et al*. (2019) concluded that there is only weak evidence linking mirror neurons to social cognition in humans. If physical and social perspective-taking were closely linked we would expect more consistent evidence, e.g. showing abnormal

structure and function in mirror neuron-rich brain regions in people with deficits in perspective-taking.

Chapter 8 Schizophrenia

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1. Hallucinations are sensory experiences that have no basis in reality or are distorted perceptions of real things. For example, hearing voices or seeing people who aren't there.

Delusions are beliefs that have no basis in reality. For example, beliefs about being a very important person or the victim of a conspiracy.

2. Positive symptoms are additional experiences beyond those of ordinary existence, such as hallucinations. Negative symptoms lead to a loss of usual abilities and experiences, such as avolition.

3. Co-morbidity is the occurrence of two illnesses together which confuses diagnosis and treatment. Around half of all people with schizophrenia are also diagnosed with depression.

Symptom overlap is when two or more conditions share symptoms, questioning the validity of the classification. For instance, schizophrenia shares some symptoms with the mania phase of bipolar disorder, such as disorganised language and thinking.

4. Diagnosis and classification are interlinked. To diagnose a specific disorder, we need to be able to distinguish one disorder from another. Classification involves identifying symptoms that go together to produce a disorder. Diagnosis is when clinicians identify symptoms and use a classification system to identify the disorder (e.g. depression, OCD, schizophrenia etc.). There are two main classification systems in use: DSM-5 – one positive symptom must be present (delusions, hallucinations or speech disorganisation) and ICD-10 (V11 published but not used for diagnosis until 2022) – in which two or more negative symptoms are sufficient for diagnosis (e.g. avolition and speech poverty).

One strength of diagnosis of schizophrenia is good reliability. A reliable diagnosis is consistent between clinicians (inter-rater) and between occasions (test-retest). Osório *et al*. (2019) report excellent reliability for schizophrenia diagnosis (DSM-5) – inter-rater agreement of +.97 and test-retest reliability of +.92. This means that the diagnosis of schizophrenia is consistently applied.

One limitation of diagnosis of schizophrenia is low validity. Criterion validity involves seeing whether different procedures used to assess the same individuals arrive at the same diagnosis. Cheniaux *et al.* (2009) had two psychiatrists independently assess the same 100 clients. 68 were diagnosed with schizophrenia with ICD and 39 with DSM. This means that schizophrenia is either over- or underdiagnosed, suggesting that criterion validity is low.

That said, in the Osório study there was excellent agreement between clinicians using different procedures both derived from the DSM system. This means that the criterion validity for schizophrenia is good provided it takes place within a single diagnostic system.

Another limitation is co-morbidity with other conditions. If conditions often co-occur then they might be a single condition. Schizophrenia is commonly diagnosed with other conditions. For example Buckley *et al.* (2009) concluded that schizophrenia is comorbid with depression (50% of cases), substance abuse (47%) or OCD (23%). This suggests that schizophrenia may not exist as a distinct condition.

A further limitation is gender bias. Men are diagnosed with schizophrenia more often than women, in a ratio of 1.4:1 (Fischer and Buchanan 2017). This could be because men are more genetically

vulnerable, or women have better social support, masking symptoms. This means that some women with schizophrenia are not diagnosed so miss out on helpful treatment.

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1. Neural correlates are measurements of the structure or function of the brain that correlate with the positive or negative symptoms of schizophrenia. For instance, loss of motivation (avolition) in schizophrenia may be explained by low activity levels in the ventral striatum.

2. Dopamine (DA) is widely believed to be involved in schizophrenia because it is featured in the functioning of brain systems related to the symptoms of schizophrenia. High dopamine activity – hyperdopaminergia – in the subcortex (central areas of the brain) is associated with hallucinations and poverty of speech (e.g. excess of dopamine receptors in Broca's area). More recent versions of the dopamine hypothesis have focused on low levels of dopamine – hypodopaminergia – in the prefrontal cortex (responsible for thinking and decision-making).

3. One strength is the strong evidence base. Family studies (e.g. Gottesman, facing page) show risk increases with genetic similarity. One twin study found 33% concordance for MZ and 7% for DZ twins (Hilker *et al.* 2018). Adoption studies (e.g. Tienari *et al.* 2004) show that biological children of parents with schizophrenia are at greater risk even if they grow up in an adoptive family. This shows that some people are more vulnerable to schizophrenia because of their genes.

One limitation is evidence for environmental risk factors. Biological risk factors include birth complications (Morgan *et al*. 2017) and smoking THC-rich cannabis in teenage years (Di Forti *et al.* 2015). Psychological risk factors include childhood trauma e.g. 67% with schizophrenia (38% matched controls) reported at least one childhood trauma (Mørkved et al. 2017). This means genes alone cannot provide a complete explanation for schizophrenia.

4. There is a strong relationship between genetic similarity of family members and shared risk of developing schizophrenia. Gotteman's (1991) family study found identical twins (100% genes shared) have a 48% shared risk of schizophrenia. Siblings (50% genes shared) have a 9% shared risk. Schizophrenia is polygenic (requires several genes) and aetiologically heterogeneous (risk is affected by different combinations).

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the dopamine hypothesis have focused on low levels of dopamine – hypodopaminergia – in the prefrontal cortex (responsible for thinking and decision-making).

One strength is support for dopamine in the symptoms of schizophrenia. Amphetamines (increase DA) mimic symptoms (Curran *et al*. 2004). Antipsychotic drugs (reduce DA) reduce intensity of symptoms (Tauscher *et al*. 2014). Candidate genes act on the production of DA or DA receptors. This strongly suggests that dopamine is involved in the symptoms of schizophrenia.

One limitation is evidence for a central role for glutamate. Post-mortem and scanning studies found raised glutamate in people with schizophrenia (McCutcheon *et al*. 2020). Also, several candidate genes for schizophrenia are believed to be involved in glutamate production or processing. This means that a strong case can be made for a role for other neurotransmitters in schizophrenia.

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1. Lower levels of information processing in some areas of the brains of people with schizophrenia suggest cognition is impaired. For example, reduced processing in the ventral striatum is associated with negative symptoms. Meta-representation is the cognitive ability to reflect on thoughts and behaviour (Frith *et al*. 1992). This dysfunction disrupts our ability to recognise our thoughts as our own – could lead to the sensation of hearing voices (hallucination) and having thoughts placed in the mind by others (delusions).

2. Double-bind theory – Bateson *et al*. (1972) described situations where a child may be regularly trapped in situations where they fear doing the wrong thing, but receive conflicting messages about what counts as wrong. They cannot express their feelings about the unfairness of the situation. When they 'get it wrong' (often) the child is punished by withdrawal of love – they learn the world is confusing and dangerous, leading to disorganised thinking and delusions.

Expressed emotion (EE) is the level of emotion (mainly negative) expressed towards the person with schizophrenia and includes verbal criticism of the individual, hostility towards them and emotional over-involvement in their life. High levels of EE cause stress in the person and may trigger onset of schizophrenia or relapse.

3. One strength is evidence for dysfunctional thought processing. Stirling *et al*. (2006) compared performance on a range of cognitive tasks (e.g. Stroop task) in people with and without schizophrenia. As predicted by central control theory, people with schizophrenia took over twice as long on average to name the font-colours. This supports the view that the cognitive processes of people with schizophrenia are impaired.

4. The double-bind theory is a form of family dysfunction argument for schizophrenia. Bateson *et al*. (1972) described situations where a child may be regularly trapped in situations where they fear doing the wrong thing, but receive conflicting messages about what counts as wrong. They cannot express their feelings about the unfairness of the situation. When they 'get it wrong' (often) the child is punished by withdrawal of love – they learn the world is confusing and dangerous, leading to disorganised thinking and delusions.

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One strength is evidence linking family dysfunction to schizophrenia. A review by Read *et al.* (2005) reported that adults with schizophrenia are disproportionately likely to have insecure attachment (Type C or D). Also, 69% of women and 59% of men with schizophrenia have a history of physical and/or sexual abuse. This strongly suggests that family dysfunction does make people more vulnerable to schizophrenia.

One limitation is the poor evidence base for any of the explanations. There is almost no evidence to support the importance of traditional family-based theories e.g. schizophrenogenic mother and double bind. Both theories are based on clinical observation of patients and informal assessment of the personality of the mothers of patients. This means that family explanations have not been able to explain the link between childhood trauma and schizophrenia. It is far more likely that patients with schizophrenia have inherited a biological vulnerability to schizophrenia (through a faulty gene or genes) which may be triggered as a result of trauma. This supports the diathesis-stress model of schizophrenia.

Research in this area may be useful, e.g. showing that insecure attachment and childhood trauma affect vulnerability to schizophrenia. However, research is socially sensitive because it can lead to parent-blaming. This creates additional stress for parents already seeing their child experience schizophrenia and taking responsibility for their care. This means that research into family dysfunction and schizophrenia will always be very controversial but worth it for potential benefits.

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1. Typical antipsychotic drugs (e.g. *chlorpromazine*) work by acting as antagonists in the dopamine system and aim to reduce the action of dopamine – they are strongly associated with the dopamine hypothesis. Dopamine antagonists work by blocking dopamine receptors in the synapses in the brain, reducing the action of dopamine.

Atypical antipsychotics (e.g. *clozapine*) aim to improve the effectiveness of drugs in suppressing psychoses such as schizophrenia and also minimise the side effects. *Clozapine* acts on dopamine, glutamate and serotonin to improve mood as well as cognitive functioning.

2. Typical antipsychotic drugs (e.g. *chlorpromazine*) have been around since the 1950s. They work by acting as antagonists in the dopamine system and aim to reduce the action of dopamine – they are strongly associated with the dopamine hypothesis. Dopamine antagonists work by blocking dopamine receptors in the synapses in the brain, reducing the action of dopamine.

Initially, dopamine levels build up after taking *chlorpromazine*, but then production is reduced. This normalises neurotransmission in key areas of the brain, which in turn reduces symptoms like hallucinations. *Chlorpromazine* also has an effect on histamine receptors, which appears to lead to a sedation effect. Therefore it is also used to calm anxious patients when they are first admitted to hospital.

3. A limitation is that antipsychotic drugs may simply be a 'chemical cosh'. Antipsychotics may have been used in hospital situations to calm patients and make them easier for staff to work with, rather than to benefit the patients themselves. However, calming people distressed by hallucinations and delusions probably makes them feel better, and allows them to engage with other treatments (e.g. CBT) and services. On balance there are clear benefits to using antipsychotics to calm people with schizophrenia and in the absence of a better alternative they should probably be prescribed.

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Atypical antipsychotics (e.g. *clozapine*) bind to dopamine receptors as *chlorpromazine* does but also act on serotonin and glutamate receptors. This drug was more effective than typical antipsychotics – *clozapine* reduces depression and anxiety as well as improving cognitive functioning. It also improves mood, which is important as up to 50% of people with schizophrenia attempt suicide.

One strength of antipsychotics is evidence of their effectiveness. Thornley *et al.* (2003) reviewed data from 13 trials (1121 participants) and found that *chlorpromazine* was associated with better functioning and reduced symptom severity compared with placebo. There is also support for the benefits of atypical antipsychotics. Meltzer (2012) concluded that *clozapine* is more effective than typical antipsychotics, and that it is effective in 30–50% of treatment-resistant cases. This means that, as far as we can tell, antipsychotics work.

However, most studies are of short-term effects only and some data sets have been published several times, exaggerating the size of the evidence base (Healy 2012). Also benefits may be due to the calming effects of drugs rather than real effects on symptoms. This means the evidence of effectiveness is less impressive than it seems.

One limitation of antipsychotic drugs is the likelihood of side effects. Typical antipsychotics are associated with dizziness, agitation, sleepiness, weight gain, etc. Long-term use can lead to lip-smacking and grimacing due to dopamine supersensitivity (a condition known as tardive dyskinesia). The most serious side effect is neuroleptic malignant syndrome (NMS) caused by blocking dopamine action in the hypothalamus (which can be fatal due to disrupted regulation of several body systems). This means that antipsychotics can do harm as well as good and individuals may avoid them (reducing effectiveness).

Another limitation of antipsychotics is that we do not know why they work. The use of most of these drugs is strongly tied up with the dopamine hypothesis and the idea that there are higher-than-usual levels of dopamine in the subcortex of people with schizophrenia. But there is evidence that this may not be correct and that dopamine levels in other parts of the brain are too low rather than too high. If so, most antipsychotics shouldn't work. This means that antipsychotics may not be the best treatment to opt for – perhaps some other factor is involved in their apparent success.

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1. Family therapy aims to reduce levels of expressed emotion (EE), especially negative emotions such as anger and guilt which create stress. Reducing stress is important to reduce the likelihood of relapse. The therapist encourages family members to form a therapeutic alliance whereby they all agree on the aims of therapy. The therapist also tries to improve families' beliefs about and behaviour towards schizophrenia. A further aim is to ensure that family members achieve a balance between caring for the individual with schizophrenia and maintaining their own lives.

2. The aims of CBT in general are to help clients identify irrational thoughts (e.g. delusions and hallucinations) and try to change them. The treatment usually consists of 5–20 sessions, individually

or in a group. CBT helps clients to understand their symptoms. Clients are helped to make sense of how their delusions and hallucinations impact on their feelings and behaviour. For example, a client may hear voices and believe they are demons so they will be very afraid. Normalisation involves explaining to the client that hearing voices is an ordinary experience.

3. One strength of family therapy is evidence of its effectiveness. McFarlane (2016) concluded family therapy is effective for schizophrenia and relapse rates were reduced by 50–60%. It is particularly promising during time when mental health initially starts to decline. NICE recommends family therapy. This means that family therapy is good for people with both early and 'full-blown' schizophrenia.

Another strength is the benefits for the whole family. Therapy is not just for the benefit of the identified patient but also for the families that provide the bulk of care for people with schizophrenia (Lobban and Barrowclough). Family therapy lessens the negative impact of schizophrenia on the family and strengthens ability of the family to give support. This means family therapy has wider benefits beyond the obvious positive impact on the identified patient.

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One strength of CBT is evidence for its effectiveness. Jauhar *et al*. (2014) reviewed 34 studies of CBT for schizophrenia, and concluded that there is evidence for significant effects on symptoms. Pontillo *et al*. (2016) found reductions in auditory hallucinations. Clinical advice from NICE (2019) recommends CBT for people with schizophrenia. This means both research and clinical experience support CBT for schizophrenia.

One limitation is the quality of the evidence. Thomas (2015) points out that different studies have focused on different CBT techniques and people with different symptoms. Overall modest benefits

of CBT for schizophrenia may conceal a range of effects of different techniques on different symptoms. This means that it is hard to say how effective CBT will be for treating a particular person with schizophrenia.

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1. Token economies are reward systems (operant conditioning) used to manage the behaviour of people with schizophrenia who spend long periods in psychiatric hospitals. Tokens (e.g. coloured discs) are given to individuals who carry out desirable behaviours (e.g. getting dressed, making a bed, etc.). This reward reinforces the desirable behaviour and because it is given immediately it prevents 'delay discounting' (reduced effect of a delayed reward).

Tokens have no value in themselves but can be swapped later for tangible rewards (e.g. sweets, a walk outside, etc.). They are secondary reinforcers because they only have value due to the learned association (classical conditioning) with innate primary reinforcers.

2. As above.

3. One limitation is the ethical issues raised. Professionals have the power to control people's behaviour and this means imposing one person's norms on to others (e.g. a patient may like to look scruffy). Also restricting the availability of pleasures to people who don't behave as desired means that very ill people, already experiencing distressing symptoms, have an even worse time. This means that benefits of token economies may be outweighed by the impact on freedom and short-term reduction in quality of life.

4. Ayllon and Azrin (1968) used a token economy in a schizophrenia ward. A gift token was given for every tidying act and tokens were later swapped for privileges e.g. films. Token economies were extensively used in the 1960s and 70s but there was a decline in the UK due to a shift towards care in the community rather than hospitals and because of ethical concerns. Token economies still remain a standard approach to managing schizophrenia in many parts of the world.

Institutionalisation occurs in long-term hospital treatment. Matson *et al*. (2016) identified three categories of institutional behaviour that can be tackled using token economies: personal care, condition-related behaviours (e.g. apathy) and social behaviour. Modifying these behaviours does not cure schizophrenia but has two major benefits. First, token economies improve the quality of life within the hospital setting, e.g. putting on make-up or becoming more sociable with other residents. Second, individuals are encouraged to return to more 'normal' behaviour, making it easier to adapt back into the community e.g. getting dressed or making the bed.

One strength is evidence of effectiveness. Glowacki *et al*. (2016) identified seven high quality studies published between 1999 and 2013 on the effectiveness of token economies in a hospital setting. All the studies showed a reduction in negative symptoms and a decline in frequency of unwanted behaviours. This supports the value of token economies.

That said, seven studies is quite a small evidence base. One issue with such a small number of studies is the file drawer problem – a bias towards publishing positive findings. This means that there is a serious question over the effectiveness of token economies.

One limitation is the ethical issues raised. Professionals have the power to control people's behaviour and this means imposing one person's norms on to others (e.g. a patient may like to look scruffy). Also restricting the availability of pleasures to people who don't behave as desired means

that very ill people, already experiencing distressing symptoms, have an even worse time. This means that benefits of token economies may be outweighed by the impact on freedom and short-term reduction in quality of life.

Another limitation is the existence of more pleasant and ethical alternatives. Other approaches do not raise ethical issues, e.g. art therapy is a high-gain, low-risk approach to managing schizophrenia (Chiang *et al.* 2019). Even if the benefits of art therapy are modest, this is true for all approaches to treatment and management of schizophrenia and art therapy is a pleasant experience. This means that art therapy might be a good alternative to token economies – there are no side effects or ethical abuses.

Page 137

1. In the original diathesis-stress model, diathesis was entirely the result of a single 'schizogene'. Meehl (1962) argued that someone without this gene should never develop schizophrenia, no matter how much stress they were exposed to. But a person who does have the gene is vulnerable to the effects of chronic stress (e.g. a schizophrenogenic mother). The schizogene is necessary but not sufficient for the development of schizophrenia.

Turkington *et al*. (2006) suggests it is possible to believe in biological causes of schizophrenia and still practise CBT to relieve psychological symptoms. But this requires adopting an interactionist model – it is not possible to adopt a purely biological approach, tell patients that their condition is purely biological (no psychological significance to their symptoms) and then treat them with CBT.

2. As above.

3. One limitation of the original diathesis-stress model is it is oversimplistic. Multiple genes increase vulnerability, each with a small effect on its own – there is no schizogene. Stress comes in many forms, including dysfunctional parenting. Researchers now believe stress can also include biological factors. For example, Houston *et al.* (2008) found childhood sexual trauma was a diathesis and cannabis use a trigger. This means that there are multiple factors, biological and psychological, affecting both diathesis and stress.

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Thea's father was also diagnosed with schizophrenia which suggests Thea possesses the gene or the combination of genes required to increase her vulnerability/predisposition to schizophrenia (diathesis). This, coupled with her traumatic and unpredictable childhood which acts as the environmental trigger (stress), is sufficient for her to develop schizophrenia. Thea's psychiatrist appears to recognise the importance of an interactionist approach to treatment. The antipsychotics will stabilise her symptoms, which means Thea will be more receptive to the benefits of CBT.

One strength is support for the dual role of vulnerability and stress. Tienari *et al.* (2004) studied children adopted away from mothers diagnosed with schizophrenia. The adoptive parents' parenting styles were assessed and compared with a control group of adoptees with no genetic risk. A child-rearing style with high levels of criticism and conflict and low levels of empathy was implicated in the development of schizophrenia but only for children with a high genetic risk. This shows that a combination of genetic vulnerability and family stress leads to increased risk of schizophrenia.

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Chapter 9 Eating behaviour

Page 139

1. Neophobia is an innate predisposition to avoid anything new. In terms of food preferences, it is an adaptive behaviour which reduces the risks associated with unfamiliar foods until we learn they are safe. It diminishes once we learn that specific foods will not poison us or cause us to become ill and gives way to a different evolutionary mechanism that encourages consumption of a more varied diet, giving us greater access to important nutrients.

Taste aversion is a predisposition to learn to avoid potentially toxic foods. Bitter compounds in food are usually a reliable warning sign of toxins or that the food has gone off, so it is beneficial to survival to be able to detect these compounds quickly. It is a preference noted before any learning of taste preference has taken place, strongly suggesting an innate mechanism at work.

2. The evolutionary explanation focuses on explaining how the preferences seen in babies might be explained in terms of adaptiveness and survival. For example, the preference for sweetness is because it is a reliable signal of high-energy food, salt because it is necessary for many essential cell functions and for fat because it is high in calories and makes foods more palatable.

Neophobia is the innate predisposition to avoid any new foods, which is an adaptive behaviour as it reduces the potential safety risks until we learn they are safe. It diminishes once we learn that specific foods will not poison us or cause us to become ill and gives way to a different evolutionary mechanism that encourages consumption of a more varied diet and important nutrients.

Taste aversion is said to occur to avoid potentially toxic foods which are often signified by a bitter taste. It is therefore beneficial to be able to detect these compounds quickly. It is a preference noted before any learning of taste preference had taken place, strongly suggesting an innate mechanism at work.

3. Torres *et al*.'s (2008) review of studies concluded that humans do tend to prefer high-fat foods in periods of stress. Stress triggers the fight or flight response which creates high energy demands. Therefore an increased fat preference during times of stress supports the view that such a preference is important for survival.

However there is evidence that neophobia is no longer adaptive in the modern food environment and can be a disadvantage. Most food consumed in many parts of the world is sold by retailers and outlets subject to strict laws and is safer than it has ever been offering little threat to survival. Caution about trying new foods in childhood (neophobia) protected us from sickness and death but now it prevents us from eating safe foods from an early age. Therefore neophobia restricts a child's diet and limits access to a wider variety of safe foods that provide nutritional benefits.

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There are other limitations to some aspects of the theory, for example taste aversions are not universal as shown by Drewnowski *et al*. (2001). They found that some people cannot taste the bitter-tasting chemical PROP but others are very sensitive to it and avoid foods containing it. We would not expect this arrangement if taste aversion is an adaptive trait. It seems that some adaptive preferences are not selected in the way we would expect according to evolutionary theory.

On the other hand, PROP insensitivity may be linked to other traits that are adaptive. Some bitter compounds in some foods may protect against cancer. People who cannot detect the bitterness may be benefitting in another way. This suggests that a preference for bitter foods in our evolutionary history could be an adaptive trait after all.

Finally, one of the greatest concerns regarding the evolutionary approach to food preferences is that it cannot explain cultural differences. Cashdan (1998) argues culture plays the main role in determining which foods are accepted and rejected, and a role in ethnic identity. However, evolutionary factors may be at work – different cultures share similar food preferences, and food preferences are difficult to change. Therefore, evolutionary influences seem to be more important in food preferences because they underlie even cultural differences.

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1. The social learning theory of food preferences proposes that children acquire the food preferences of role models they observe eating certain foods. The effect is greatest when the model is rewarded and the child identifies with them. As such, family influences are the most obvious social influence on preference learning because parents are 'gatekeepers' of children's eating.

2. One social influence on food preference is explained by social learning theory. Children acquire the food preferences of role models they observe eating certain foods. This modelling is beneficial because it ensures children eat foods that are obviously safe because others are eating them, otherwise toddlers will try to eat potentially dangerous foods. The effect of modelling is greatest when the model is rewarded and the child identifies with them. This means the family is the most obvious social influence on preference learning because parents are 'gatekeepers' of children's eating.

Cultural factors are probably the most powerful influences on food preference, as culture determines to a large extent which foods children are exposed to in the first place. In most cases children learn cultural rules related to food from eating with family members. Cultural norms influence preferences, e.g. 'meat and two veg' and believing the main Sunday meal must be roast dinner are common cultural ideals in British households. These norms are established through vicarious reinforcement, for example, children see their parents enjoying these foods (rewarding) and classical conditioning, for example, we associate many foods we eat as adults with happiness growing up.

3. Flavour-flavour learning attempts to explain both food preferences and aversions. However, the evidence is much stronger for aversion learning than preference learning. For instance Baeyens *et al*. (1996) found that pairing a new food with a soapy-flavoured chemical called Tween created a lasting aversion to the food. This suggests that the classical conditioning explanation can account for the development of food aversions.

Unfortunately, the same study suggested that classical conditioning is less successful in explaining food preferences. The researchers paired a new food with a sweet flavour for one group of students, and paired it with a neutral flavour for another group and there was no difference in flavour preference between the two groups. Therefore there is in fact very little evidence that classical conditioning via flavour-flavour learning is a valid explanation for food preferences.

There is support for a social learning approach to food preferences. Jansen and Tenney (2001) found children's most preferred taste was an energy-dense drink taken at the same time as a teacher who clearly enjoyed it. They identify with and imitate the teacher's preference for the drink and the preference is reinforced because they observed that drinking it was rewarding. This evidence supports the roles of identification and vicarious reinforcement in social learning of preferences.

4. One explanation of food preference that includes social influences is operant conditioning. Parents and older siblings often provide rewards (e.g. praise) or punishments for younger children eating certain foods. In both Maricel's and Jade's cases praise for eating like the rest of the family might have reinforced the preference. However it is still notoriously hard to establish a preference for some foods (e.g. green vegetables) in children using rewards, which suggests that social learning is probably a more powerful form of food preference learning than operant conditioning.

In terms of SLT, the chances are that Maricel and Jade both acquired the food preferences of role models they observed eating certain foods. The effect of modelling would have been greatest when the models – most likely parents – were rewarded and Maricel and Jade identified with them. This means the family is the most obvious social influence on preference learning in both cases because Maricel's and Jade's parents would have been 'gatekeepers' of their eating.

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Another social influence on Maricel's and Jade's preferences may have been television. As children become independent of their parents' food choices, other models become more important. Maricel and Jade may have encountered many TV programmes in which culturally-appropriate food preferences were promoted (e.g. characters in soap operas eating fish and chips).

However, although family influences on preferences can last a lifetime, the social learning effects of TV are less persistent. Hare-Bruun *et al*. (2011) found children who watched most TV also had the most unhealthy food preferences. But this link was much weaker in a six-year follow-up, and disappeared altogether for girls. This suggests that as children get older, close friends may be more powerful social influences on long-term preferences.

Cultural norms are also known to establish preferences: fish and chips is a British tradition and sapin-sapin is a Philippino one and this may also account for Jade's and Maricel's preferences. Such norms are established through vicarious reinforcement, for example, children seeing parents enjoying these foods (rewarding) and classical conditioning, for example, we associate many foods we eat as adults with happiness growing up.

This is supported by research into cultural change. A major cultural change in many societies has been the increasing availability of food outside the home. This has generally encouraged a preference for 'fast food' which is high in fat, salt and sugar. So whereas fish and chips would once have been seen as an occasional 'treat', it is now a regular part of many people's diet. Therefore wider cultural changes strongly influence the type of foods people eat.

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1. The hypothalamus regulates the level of glucose (energy source) in blood. Glucose-sensing neurons in the hypothalamus detect fluctuations in blood glucose concentration and the hypothalamus also regulates glucose by directing insulin and anti-insulin hormones (e.g. glucagon) in the pancreas.

Ghrelin is an appetite stimulant secreted by the stomach. The longer we go without food (the more empty our stomach becomes) the more ghrelin is released. The level is detected by receptors in the arcuate nucleus of the hypothalamus. When levels rise above a set point the arcuate nucleus signals the lateral hypothalamus (LH) to secrete Neuropeptide Y (NPY).

Leptin is an appetite suppressant which is secreted by adipose cells. Leptin blood level increases with fat level and is detected by the ventromedial hypothalamus (VMH). When the level of leptin increases beyond a set point a person feels full and stops eating.

2. The hypothalamus controls both neural and hormonal mechanisms in the control of eating. It regulates the level of glucose (energy source) in the blood and it is also the site of glucose-sensing neurons which detect fluctuations in blood glucose concentration. Hormonally the hypothalamus regulates glucose by directing insulin and anti-insulin hormones (e.g. glucagon) in the pancreas.

The dual-centre model of eating suggests that there are two structures of the hypothalamus that provide homeostatic control. The 'on switch' is the lateral hypothalamus (LH) which contains cells to detect glucose levels in liver. The 'off switch' is in the ventromedial hypothalamus (VMH) and eating leads to a rise in levels of glucose in the bloodstream and liver (glycogen) – detected by cells in the VMH. The VMH is triggered once levels increase past a set point – LH activity is inhibited at the same time, so the person becomes satiated (feels full and stops eating).

Ghrelin and leptin are both hormones with the former being an appetite stimulant and the latter a suppressant. The longer we go without food (more empty stomach) the more ghrelin is released – the level is detected by receptors in the arcuate nucleus of the hypothalamus. When levels rise above a set point the arcuate nucleus signals the LH to secrete Neuropeptide Y (NPY). Meanwhile

leptin blood level increases with fat level and is detected by the VMH – part of the VMH satiety mechanism. When the level of leptin increases beyond a set point a person feels full and stops eating.

3. One limitation of hormonal models of eating control is that social and cultural influences are underplayed. Woods (2004) points out that the LH feeding centre detects falling blood glucose and stimulates hunger only in severe energy deprivation. Neurochemistry plays a lesser role in everyday eating onset, which is more controlled by social/cultural factors (e.g. times of day for meals). This suggests a biological approach ignores potentially important nonbiological factors that may contribute more to controlling eating behaviour.

A further limitation of the role is that it is oversimplified. Valassi *et al*. (2008) argue that biological contributions to eating behaviour are numerous. CCK (cholecystokinin) is a hormone that activates the nerve that sends signals to the hypothalamus to 'stop eating'. It may be a more powerful appetite suppressant than leptin. This suggests that a relatively straightforward homeostatic account does not accurately reflect the true complexity of eating control.

4. The hypothalamus controls both neural and hormonal mechanisms in the control of eating. It regulates the level of glucose (energy source) in the blood and it is also the site of glucose-sensing neurons which detect fluctuations in blood glucose concentration. Hormonally the hypothalamus regulates glucose by directing insulin and anti-insulin hormones (e.g. glucagon) in the pancreas.

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A strength of the dual-centre model of eating is research support. Hetherington and Ranson (1942) found that lesioning the VMH of rats made them hyperphagic (overeat) and severely obese. Anand and Brobeck (1951) lesioned the LH of rats and found aphagia (cessation of eating/starvation). This confirms the homeostatic mechanism ‑ two brain centres with opposing functions as predicted by the dual-centre model. However, Gold (1973) claims Hetherington and Ranson's operation also damaged the rats' paraventricular nucleus (PVN) and that when lesions are limited to the VMH, hyperphagia does not occur. This suggests that physiological control of eating behaviour may involve more than two brain centres.

However, Valassi *et al*. (2008) argue that biological contributions to eating behaviour are numerous. CCK (cholecystokinin) is a hormone that activates the nerve that sends signals to the hypothalamus to 'stop eating'. It may be a more powerful appetite suppressant than leptin. This suggests that a relatively straightforward homeostatic account does not accurately reflect the true complexity of eating control.

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A limitation of both neural and hormonal mechanisms is that our knowledge is based mostly on animal research. We should be cautious about extrapolating findings to humans without considering differences between species that may make generalisations invalid. This is because eating behaviour is more complex in humans than in rats, e.g. there are more influences affecting human eating behaviour. But studying rats may be a valid way of understanding neural and hormonal mechanisms as most structures found in a human brain are in a rat brain too. This suggests that the model is well supported.

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1. These are any explanations of anorexia nervosa (AN) in terms of dysfunctions of the brain and nervous system. This includes the activity of brain structures such as the hypothalamus, and neurotransmitters such as serotonin and dopamine. For instance, decreased dopamine levels are associated with AN. Kaye *et al*. (1991) found that levels of the dopamine metabolite HVA were lower in recovered AN participants compared with controls.

2. The genetic explanation focuses on the fact that AN tends to run in families whereas the neural explanation focuses on the effects of the neurotransmitters serotonin and dopamine on AN behaviours and the associated anxiety.

The genetic explanation has been able to identify at least one candidate gene (Ephx2) that codes for an enzyme involved in cholesterol metabolism. Many people in acute phase of AN have abnormally high levels of cholesterol whereas serotonin research indicates underactivity of the serotonin system in AN.

3. A strength of the dopamine explanation is it is supported by research evidence. Kaye *et al*. (1999) compared severely underweight women diagnosed with AN with women who had no history of eating disorders. The levels of the dopamine metabolite HVA were 30% lower in the women with AN, on average. This strongly suggest that a dysfunction of dopamine metabolism contributes to the symptoms of AN.

A limitation of the serotonin explanation is other neurotransmitters are involved. Nunn *et al*. (2012) argue that serotonin alone does not distinguish between people with and without AN. Serotonin accounts for some features of AN but not others. AN is better explained by considering interactions between serotonin and noradrenaline. Other neurotransmitters (e.g. GABA) are also involved. This is a reminder that neurotransmitter systems do not operate in isolation; instead there are complex interactions. But the explanation is recent and remains to be fully tested.

4. Serotonin has been found to be involved in many AN-related behaviours (e.g. obsessiveness) and is therefore on the side of the 'chemical imbalances' argument. For example, Bailer and Kaye (2011) found low levels of 5-HIAA (serotonin metabolite) in people with AN return to normal after short-

term weight recovery – levels actually increase beyond normal in the long term. Decreased dopamine levels are also associated with AN. Kaye *et al*. (1991) found HVA (dopamine metabolite) levels were lower in recovered AN participants compared with controls.

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On the other hand, studies of MZ and DZ twins show anorexia nervosa (AN) does run in families. Holland *et al*. (1988) found MZ concordance rate of 56% but only 5% for DZs. A candidate-gene association study (CGAS) by Scott-Van Zeeland *et al*. (2014) sequenced 152 candidate genes possibly linked with features of AN and found only one gene associated with AN: Ephx2 (epoxide hydrolase 2). But this gene is significant because it codes for an enzyme involved in cholesterol metabolism. People in the acute phase of AN do have abnormally high levels of cholesterol.

Boraska *et al*. (2014) identified 72 separate genetic variations but none were significantly related to AN, possibly because the study was not sensitive enough to detect genetic influences.

One limitation of twin studies is that they may lack validity. The assumption of 'equal environments' may be incorrect. It can be argued that MZ twins are treated more similarly than DZs by parents, other family members, friends, teachers. They spend more time together and may even have a closer bond than DZs. Greater environmental similarity for MZs suggests heritability estimates are artificially inflated and genetic influences on AN are not as great as twin studies suggest.

One strength is that gene studies illustrate the polygenic nature of AN. Gene studies have been unsuccessful in identifying any single gene for AN, many candidate genes have been discarded. No single gene can be responsible for the wide variety of physical and psychological symptoms of AN (e.g. appetite loss, body image distortions). Therefore gene studies have shown that AN is polygenic, which means that many genes make important but modest contributions to the disorder.

It is therefore likely that AN cannot be understood in terms of genes alone. AN is best understood in terms of genes that create a vulnerability to AN (diathesis) that only expresses itself when the individual tries to lose weight (a stressor) – this is the diathesis-stress model**.** People lose weight for many reasons and non-biological risk factors play a triggering role. This suggests whilst biological explanations are still valid they must be seen in a wider context of other non-genetic factors.

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1. Enmeshment is where members of an 'anorexic family' are overinvolved and overprotective. Their self-identities are bound up with each other. Roles are poorly defined and there is little privacy. Minuchin *et al.* (1978) noted this as a key characteristic of a dysfunctional family system in causing eating disorders.

Autonomy refers to our experience of freedom in deciding how we should behave, and independence from others. For example, AN may be caused by an adolescent daughter's struggle against dependence on her domineering and intrusive family.

2. The central difference is that autonomy is a goal and control is a means of achieving that goal. Someone with AN wishes to achieve independence from her domineering and intrusive family and experience freedom in deciding for herself how to behave. This is autonomy. In order to achieve this, she engages in behaviours such as self-starvation to control her self-identity as a person independent of her family. She controls her destiny by controlling her body.

3. Family systems theory (FST) is a psychodynamic theory of anorexia nervosa (AN) by Minuchin *et al.* (1978) which suggests four problematic features of a typical 'anorexic family'.

Firstly, members of anorexic families are overinvolved with each other and the boundaries are 'fuzzy' (enmeshment). Family members spend lots of time together and can impinge on each other's privacy. An adolescent daughter in an anorexic family tries to differentiate her identity and assert her independence by refusing to eat.

Secondly, there is an issue of overprotectiveness where family members constantly defend each other from external threats. Obsessive nurturing reinforces family loyalty leaving no room for independence. Palazzoli (1974) described an enmeshed family in which the mother of a daughter with AN saw her role as a personal sacrifice. The mother felt that all her decisions were for her daughter's benefit and not her own. It is then much easier to blame the daughter with AN when things go wrong.

Rigidity of interactions is also characteristic of AN families. Problems arise when situations change due to pressure – the family is too rigid to adapt so is thrown into crisis. An adolescent daughter seeks independence but the rest of the family quash her attempt at self-differentiation and she may turn to AN behaviour.

Finally, family members take whatever steps necessary to prevent or suppress conflict (e.g. no discussion of issues where difference of opinion might arise). So, problems are not resolved and continue to fester until crisis develops. The daughter continues to refuse to eat, starving herself while her family refuses to accept there is anything to discuss.

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One strength of FST is support from evidence such as Strauss and Ryan (1987) who found women diagnosed with AN showed greater disturbances of autonomy than women who did not have AN. For instance, they had a more rigid and controlling way of regulating their own behaviour, and differentiated less clearly between their own and their families' identities (they were enmeshed). These findings show that desire for autonomy, when it is frustrated, is a risk factor for AN in females.

However, these findings are challenged by Aragona *et al*. (2011) who found that families of females with AN were no more enmeshed/rigid than non-AN families. These contradictory findings may be due to vague concepts defined differently in studies. This means that it is difficult to find conclusive support for FST theory, and ultimately it is not a scientific theory because the concepts cannot be tested.

A strength of FST, though, is that it has led to behavioural family systems therapy (BFST) which aims to disentangle family relationships and reduce parental control over the eating of the individual with AN. Robin *et al*. (1995) reported that this was successful in 6 out of 11 females with AN after 16 months of BFST, and three more had recovered after another year. FST-based therapy therefore appears to have practical value.

One limitation is that family influences on AN depend on other factors. Davis *et al*. (2004) studied such mediating factors and found that family interactions affected eating disorders only in adolescents with high anxiety. Young *et al.* (2004) found that family factors had no effect on eating disorders in cases where there is no depression and no peer influences. These mediating factors are mostly independent of family factors which shows that family factors alone cannot explain AN.

FST explains two features of AN that other theories struggle with: its tendency to appear in adolescence (link with autonomy) and its much greater incidence in females. However, it follows that FST has trouble explaining AN in non-adolescent females and in males, and it also ignores the role of fathers in family dysfunction. Therefore FST may be a useful and valid theory of AN in most cases, but it is worth bearing in mind that the theory is limited in scope.

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1. From the observer's perspective modelling is imitating the behaviour of a role model so, for example, an adolescent might copy the diet of a favourite celebrity. The role model is 'modelling' or demonstrating the specific behaviour, e.g. disordered eating, that may be imitated by an observer.

Reinforcement is the consequence of AN behaviour that increases the likelihood of that behaviour being repeated. For example, in the early days an individual with AN may be rewarded with praise from others for losing some weight.

2. The social learning theory (SLT) explains direct and indirect learning and can be used to explain anorexia nervosa (AN). Direct learning of AN involves classical and operant conditioning of an individual's behaviour whereas indirect learning involves observation of other people and the modelling and imitation of a behaviour which can be vicariously reinforced.

So, it suggests that AN is acquired indirectly through modelling an observed model. That model provides a 'template' to imitate (modelling) and could exist in real life (e.g. a family member) or be symbolic (e.g. a cartoon character). SLT suggests that the observations modify social norms by establishing acceptable or usual behaviour (e.g. a child observes an older sibling restricting their food intake and learns that this is 'normal') and the impact is greatest if the child identifies with model.

Vicarious reinforcement is said to increase the chance that the eating behaviour will be imitated because, if the model is rewarded, then the child learns that the behaviour (losing weight) has positive consequences. The media is a powerful transmitter of cultural ideals of body shape/size. The ideal body shape for women has become thinner over time (e.g. Size Zero).

3. The media is influential in AN because it provides a rich source of modelling and vicarious reinforcement. Music videos, magazines, websites, social media and television all communicate cultural ideals about body shape and size. As the ideal in many cultures has become thinner and thinner, this is the body presented as something for young women to aim for.

The power of models is enhanced by identification. Young women may identify with the glamour of celebrities in the media who conform to the 'thin ideal'. They may be motivated to imitate them by losing weight through dieting and exercise. This behaviour is vicariously reinforced by the rewarding fame, success, wealth, etc. that young women observe in female role models in the media.

4. Social learning theory (SLT) explains direct and indirect learning and can be used to explain anorexia nervosa (AN). Direct learning of AN involves classical and operant conditioning of an individual's behaviour whereas it is also suggested AN is acquired indirectly through imitating an observed model. That model provides a 'template' to imitate and the observations modify social norms by establishing acceptable or usual behaviour and the impact is greatest if the child identifies with the model. In Lillia's case the role model is her mother and she is imitating the dysfunctional eating that she has seen from her mother (who she identifies with) and this style of eating has become the norm in her view.

Vicarious reinforcement is said to increase the chance that the eating behaviour will be imitated as if the model is rewarded then the child learns that the behaviour (losing weight) has positive consequences. In this case Lillia sees her mum being rewarded with positive consequences (praise from her dad) and is therefore more likely to imitate the behaviour. Media may further reinforce the behaviour and is known to have a significant impact.

One strength of the SLT explanation is research support such as Becker *et al*.'s (2002) natural experiment when TV was introduced to the island of Fiji in 1995. In that year, 13% of a sample of adolescent girls gained a high score on a questionnaire measuring eating disorder risk. Three years later the figure for another sample of girls was 29%. The higher figure may be explained by a new cultural ideal of female body shape broadcast on TV and influencing girls on Fiji. This shows that eating disorders can be the outcome of social learning processes and suggests that the same

mechanism could be responsible in Lillia's case with her mum taking the role of the model rather than the media.

SLT also explains cultural changes linked to AN. AN is still more common in some cultures than others but incidence rates are increasing rapidly and SLT can explain this in terms of changing cultural norms. For example, Chisuwa and O'Dea (2010) found increased rates of AN in Japan in the last 40 years, as traditional values favouring plumpness are displaced by the thinness ideal from individualist cultures (e.g. the US). SLT shows this change is driven in part by media representations but also in Lillia's case to family members' perceptions.

Studies of MZ and DZ twins show that AN runs in families. Holland *et al*. (1988) found an MZ concordance rate of 56% but only 5% for DZs. A candidate-gene association study (CGAS) by Scott-Van Zeeland *et al*. (2014) sequenced 152 candidate genes possibly linked with features of AN and found only one gene associated with AN: Ephx2 (epoxide hydrolase 2). But this gene is significant because it codes for an enzyme involved in cholesterol metabolism. People in the acute phase of AN do have abnormally high levels of cholesterol. So it is possible that Lillia has simply inherited AN from her mother (or at least inherited a vulnerability to developing it).

However, a limitation of gene studies is that the search for a single gene is futile and we cannot therefore be sure that Lillia has inherited the AN genes. Several candidate genes have been put forward but no one gene can be found responsible for the wide variety of physical and psychological symptoms in AN (e.g. appetite loss, body image distortions, fear of weight gain). Furthermore, single-gene studies divert attention from understanding the true polygenic nature of AN.

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1. Cognitive distortions are faulty, biased and irrational ways of thinking that mean we perceive ourselves, other people and the world inaccurately and usually negatively. For example, people with AN become more and more critical of their own bodies and they misinterpret their emotional states as 'feeling fat', even as they get thinner and thinner.

Irrational beliefs (thoughts) are defined in Ellis's model as thoughts that are likely to interfere with a person's happiness. Dysfunctional thoughts such as, 'If I don't control my weight, I'm worthless' can lead to AN.

2. Williamson *et al*. (1993) researched cognitive distortions by asking participants to choose from silhouettes of increasing size to match their own body; 37 participants diagnosed with anorexia and a control group of 95 participants with no eating disorder estimated their current body size and their ideal size. It was found that the participants with AN were significantly less accurate in their size estimates than the control participants, with a marked tendency to overestimate their size. The ideal body shape for the AN participants was also significantly thinner than it was for the controls.

Treasure and Schmidt (2013) have focused on irrational beliefs and proposed a cognitive interpersonal maintenance model of AN which, among other things, suggests that people with AN experience problems with set-shifting. This means they find it difficult to switch fluently from one task to another that requires a different set of cognitive skills. Instead, they tend to apply persistently the same skills in a changed situation where they are no longer useful. Once a vulnerable individual gets started on the weight loss process, they rigidly persist with it and continue to perceive themselves as needing to lose weight. In effect, their weight loss is a solution to a problem that no longer exists, but they are unable to perceive this accurately.

3. The social learning theory of AN also explains cultural changes linked to AN. AN is still more common in some cultures than others but incidence rates are increasing rapidly and SLT can explain this in terms of changing cultural norms. For example, Chisuwa and O'Dea (2010) found increased rates of AN in Japan in the last 40 years, as traditional values favouring plumpness are displaced by the thinness ideal from individualist cultures (e.g. the US). SLT shows this change is driven in part by media representations.

One strength of the cognitive explanation is research support for disturbed perceptions. Sachdev *et al*. (2008) found no differences in brain activity between people with AN and non-AN controls when they viewed images of other people's bodies. However, when viewing images of their own bodies, AN participants showed less activity (than non-AN) in parts of brain involved in attention. This shows that disturbed perceptions exist in AN in terms of how people with AN attend to their own body.

4. The cognitive theory suggest that distortions are a cause of anorexia nervosa (AN) and this idea is central to the diagnosis of AN in DSM-5 (2012). People with AN filter experiences of life through three factors, the first being disturbed perceptions about body shape and weight. Disturbed perceptions cause preoccupations with thoughts of food, eating and body shape which in turn lead to behaviours such as food restriction and checking (e.g. constantly looking in the mirror). People with AN misinterpret emotional states as 'feeling fat', even as they get thinner.

Overestimation of body size and weight is another cognitive distortion associated with AN. Williamson *et al*. (1993) asked people with AN and a non-AN control group to estimate current and ideal body sizes and found that AN participants' estimates were significantly less accurate, with a marked tendency to overestimate size and their ideal body size was significantly thinner than for controls.

Irrational beliefs are views and attitudes about AN that do not make sense. Such thoughts give rise to automatic negative thoughts (Beck), for example: 'If I don't control my weight, I'm worthless' (all-or-nothing thinking). Perfectionism is a key irrational belief in AN and, for example, a person who exhibits perfectionism will feel that they must meet demanding standards in all areas of life but especially eating, body shape, weight loss.

According to the theory people with AN also have problems switching fluently between tasks requiring a different set of cognitive skills (set-shifting). They apply the same skills in a changed situation where they are no longer useful. For example when a vulnerable person begins a weight loss process, they rigidly persist and continue to perceive themselves as needing to lose weight. They cannot switch to a more adaptive way of thinking.

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Another strength is that there is support for perfectionism. Halmi *et al*. (2012) studied women diagnosed with AN, who completed the SIAB to assess current symptoms and the EATATE Interview to retrospectively measure childhood perfectionism. They found that childhood perfectionism (e.g. schoolwork perfectionism) was associated with current AN symptoms. This suggests perfectionism precedes onset of AN, so is a potential risk factor for development of the disorder.

On the other hand, Cornelissen *et al*. (2013) used a morphing task where women adjusted a computerised image of themselves until it matched their estimate of body size. There was no significant difference between women with and without AN in the correlation between estimated and actual body mass index (BMI). This suggests that women with AN do not have a distorted body perception, challenging a key element of the cognitive theory of AN.

There is evidence that challenges the cognitive theory's view that cognitive factors are causal in the development of AN. This is a very strong claim, but it is just as likely that cognitive factors are effects of AN rather than causes. For instance, Murphy *et al*. (2010) studied preoccupations with body shape which probably develop after AN begins, given that people with AN become more and more critical of their bodies as AN progresses. Another example is misperception of body shape and size. Someone who already has AN may overestimate their body size rather than overestimation being a cause. This suggests that cognitive factors are more likely to be consequences of AN, but they do affect how the disorder develops over time.

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1. The difference is the level of biological processes at which obesity is explained. The neural explanation is at the level of brain and nervous system activity. This includes the idea that dysfunctions of biochemistry in the form of neurotransmitters cause obesity (e.g. levels of both serotonin and dopamine may be low).

The genetic explain is the 'lower' level of the two because it can also explain the neural dysfunction in obesity. Genes associated with variations in BMI are transmitted through generations of family members. These genes may cause obesity indirectly by affecting neurotransmitter levels.

2. It is suggested that genes associated with variations in body mass index (BMI) are transmitted through generations of families. This is confirmed by the observation that obesity often runs in families.

Family studies have established a BMI concordance rate for obesity in first-degree relatives of 20–50% (Chaput *et al*. 2014). Twin studies have found MZ concordance rates for obesity are 61–80%, which suggests a substantial genetic component (Nan *et al*. 2012).

There is no single genetic cause of obesity and many genes are thought to be involved with small effects interacting to produce overall outcome, for example Locke *et al*. (2015) found 97 genes associated with variations in BMI but accounted for only 2.7% of the variation.

3. One biological explanation for obesity is the neural explanation which focuses on the role of neurotransmitters.

One strength is that this explanation is supported by evidence concerning serotonin. Ohia *et al*. (2013) highlight the importance in obesity of one serotonin receptor in particular, the 2C receptor. Studies of 'knockout' mice with no functioning 2C receptors show they develop late-onset obesity. This is evidence of a link between obesity and a dysfunctional serotonin system, at least in mice.

There is also research support for the role of dopamine. Spitz *et al*. (2000) looked at the dopamine D2 receptor which has been implicated in obesity in many studies. They compared the genomes of obese and non-obese participants and found that one version of the gene that codes for the D2 receptor was twice as prevalent in the obese participants. It seems that people who inherit fewer D2 receptors have low dopamine levels and so they experience less dopamine-activated pleasurable

reward from eating. This makes them more likely to overeat in order to get satisfaction. This supports the view that a dysfunction of dopamine activity is involved in obesity.

4. The genetic argument of the website is based on the idea that genes associated with variations in body mass index (BMI) are transmitted through generations of families. This is confirmed by the observation that obesity often runs in families. Family studies have established a BMI concordance rate for obesity in first-degree relatives of 20–50% (Chaput *et al*. 2014). Twin studies have found MZ concordance rates for obesity are 61–80%, which suggests a substantial genetic component (Nan *et al*. 2012), which certainly agrees with the website article.

There is no single genetic cause of obesity. The article is correct in using the term 'genes' (i.e. plural). Many genes are thought to be involved, with small effects interacting to produce an overall outcome, for example Locke *et al*. (2015) found 97 genes associated with variations in BMI but accounted for only 2.7% of BMI. However, the concordance rates of less than 100% points to the fact that genetics can only account for some obesity and so does not mean that obesity is definitely genetic.

This means that there are potential alternative explanations. For example, even putting aside psychological theories, there are neural explanations for obesity. Low levels of serotonin signal to the hypothalamus that we have eaten to satiety. Dysfunctions of the serotonin system can result in abnormally low levels of serotonin and therefore inaccurate satiety signals are sent to the hypothalamus. The result is that eating behaviour is disinhibited (i.e. not controlled), leading to carbohydrate cravings (i.e. desire for energy-dense foods including sugars) causing weight gain through excess calories.

Although this shows that obesity may indeed not always be *directly* genetic, as suggested by the website article, there may well be an *indirect* effect because genes determine serotonin activity (e.g. number of serotonin receptors).

One strength is a plausible mechanism to explain how genes work. Genes may influence responses to the environment (O'Rahilly and Farooqi 2008). For example, sensitivity to food-related cues and influence on neurotransmitter systems linked with obesity. This ability to explain how genes operate in obesity increases the validity of the genetic explanation.

There is further evidence challenging the role of genes. Paracchini *et al*. (2005) conducted a meta-analysis of 25 studies investigating genes possibly involved in regulating leptin (LEP gene) and leptin receptors (LEPR gene). The study found no evidence of a link between these genes and obesity. Whatever the role of leptin in obesity, it does not have a solely genetic basis. This suggests that obesity is a complex phenomenon and other non-genetic factors are important in its causation and development.

Support for the fact that obesity is not only explained by genetics comes in the form of support for the role of serotonin. Ohia *et al*. (2013) highlight the importance in obesity of one serotonin receptor in particular, the 2C receptor. Studies of 'knockout' mice with no functioning 2C receptors show they develop late-onset obesity. This is evidence of a link between obesity and a dysfunctional serotonin system, at least in mice.

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1. The main difference is that restraint is a cause whereas disinhibition is an effect.

Restraint theory suggests that dieters deliberately restrict their food/calorie intake. But this is self-defeating because restrained eaters become more preoccupied with food rather than less.

The effect of this is often disinhibition. According to this theory, restrained eaters are vulnerable to food-related cues which can be internal (e.g. mood) or external (e.g. media images, odours). These cues may trigger a loss of control over eating, resulting in a binge.

2. The boundary model assumes that both hunger and satiety are aversive. For example, when energy levels dip below a 'set point' we feel an aversive state of hunger and are motivated to eat whilst eating to fullness creates an aversive state of discomfort so we are motivated to stop eating.

The model describes a zone of biological indifference (ZBI) when we feel neither hungry nor full. In this zone, psychological factors (cognitive and social) have more influence than biological ones on food intake. It is argued that the ZBI is wider for restrained eaters and people who restrict food intake have a lower hunger boundary and a higher satiety boundary. As such more of their eating behaviour is under cognitive rather than biological control making them vulnerable to disinhibited eating.

3. One strength is support for food-related cues in disinhibition. Boyce and Kuijer (2014) showed images of thinness to restrained (dieters) and unrestrained eaters, then measured food intake in a ten-minute 'taste test' where they had access to unlimited snacks. Restrained eaters ate significantly more than unrestrained eaters after seeing the images (food-related cues), with no difference for neutral images, e.g. furniture. This shows that food-related cues act as disinhibitors which may trigger overeating and obesity in restrained eaters.

Further support comes from a study by Wardle and Beales (1988) who randomly allocated 27 obese women to a diet (restrained), exercise or control group. Restrained eaters ate significantly more because they experienced occasional disinhibition and binged beyond feeling full. This shows that restraint leading to disinhibition is a causal factor in overeating which inevitably leads to weight gain and obesity.

4. Restraint theory suggests that in restraining eating a dieter has to *think* about eating much of the time and thus exert cognitive control, e.g. by categorising foods into 'good' and 'bad' and creating rules about which foods are allowed and which are forbidden. The outcome is that the restrained eater becomes more preoccupied with food not less and no longer eats when hungry and stops when full. Their eating behaviour becomes disinhibited. Periods of restrained eating are often followed by disinhibited eating in which the individual eats as much as they want, leading to a loss of control in the presence of a disinhibitor, a food-related cue, either internal (e.g. mood) or external (e.g. media images). Restrained eaters are sensitive to these cues and vulnerable to loss of control leading to unrestrained eating (a binge).

One strength is support for food-related cues in disinhibition. Boyce and Kuijer (2014) showed images of thinness to restrained (dieters) and unrestrained eaters, then measured food intake in a ten-minute 'taste test' where they had access to unlimited snacks. Restrained eaters ate significantly more than unrestrained eaters after seeing the images (food-related cues), with no difference for neutral images, e.g. furniture. This shows that food-related cues act as disinhibitors which may trigger overeating and obesity in restrained eaters.

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However, in a prospective study, Savage *et al.* (2009) found that increases in restrained eating were linked to decreases in weight in 163 women over a six-year period. Therefore restrained eating leads to weight loss rather than weight gain in the long term, the opposite outcome to that predicted by restraint theory.

The boundary model assumes that both hunger and satiety are aversive. For example, when energy levels dip below a 'set point' we feel an aversive state of hunger and are motivated to eat whilst eating to fullness creates an aversive state of discomfort so we are motivated to stop eating.

The model describes a zone of biological indifference (ZBI) when we feel neither hungry nor full. In this zone, psychological factors (cognitive and social) have more influence than biological ones on food intake. It is argued that the ZBI is wider for restrained eaters and people who restrict food intake have a lower hunger boundary and a higher satiety boundary. As such more of their eating behaviour is under cognitive rather than biological control making them vulnerable to disinhibited eating.

However, the role of restraint is complex. Two forms of restraint are *rigid restraint* (all-or-nothing approach to limiting food intake) and *flexible restraint* (allows limited amounts of 'forbidden' foods without triggering disinhibition). Only rigid restraint is likely to lead to obesity and this could explain why Savage *et al*. (2009) found that restrained eating can produce weight loss. The fact that the boundary model presents restraint as a single behaviour does not reflect its true nature and makes this a limited approach to understanding obesity.

Many studies supporting the boundary model are lab experiments. For example, Boyce and Kuijer measured disinhibited eating with a ten-minute taste test, allowing participants to eat as much as they like. This situation is artificial and highly controlled and quite unlike most real-world food-related environments. When restrained eaters break their diets in the real world, most compensate for disinhibition afterwards (i.e. restrict calorie intake even further). This does not happen in lab experiments. Therefore, lab experiments may be useful for establishing psychological causes of obesity, but they tell us little about real-world obesity.

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1. The spiral model (Heatherton and Polivy 1992) suggests that diet failure leads to a sense of personal deficiency. Food-restricted dieting often begins in adolescence when an 'unsatisfactory' body shape leads to low self-esteem and a desire to lose weight. Initial success is often followed by the weight being regained and a sense of personal deficiency. This creates a downward spiral whereby dieters do not radically rethink their approach but simply make a bigger effort and experience more frustration and emotional distress making them vulnerable to disinhibited eating.

Metabolic changes in body make weight loss physically more difficult (e.g. ghrelin levels increase, leptin levels decrease) and the result is more failure followed by more attempts to 'diet harder', lowering of self-esteem and even an increase in depression.

2. Adriaanse *et al.* (2011) showed that there is an ironic rebound effect in dieting. Just being presented with a statement such as 'I will not eat chocolate when I am sad' reinforces the association between 'chocolate' and 'being sad'. This makes the link more accessible in memory and easier to recall. They also showed that this ironic effect is not just cognitive but is behavioural too. Participants who were presented with such statements ate more unhealthy snacks and consumed more calories in the following week than a control group. This finding shows how just thinking of oneself as dieting can lead to the failure of the diet.

The researchers showed that restricted eating diets often fail because food becomes more salient when a diet imposes rules about eating. So the paradoxical outcome of trying to suppress a thought about food is to make disinhibited eating more likely.

This can be the trigger for a spiral into dieting failure because when eating becomes disinhibited in this way the dieter may try even harder not to think about food, which makes it more likely they do, leading to further disinhibition.

3. Ironic processes theory is supported by Adriaanse *et al*. (2011) who found exposure to statements like 'When I am sad, I will not eat chocolate' reinforced association between 'being sad' and 'eating chocolate', making the link accessible in memory and recall more likely. This so-called ironic rebound effect is behavioural as well as cognitive because snack diaries showed participants ate more unhealthy snacks and calories than the control group in the following week confirming the difficulty in suppressing thoughts of eating once they become accessible in memory.

However, although evidence shows ironic processes operate in eating behaviour it is unclear how far they account for success and failure of dieting. The effects of ironic processes are exaggerated in 'snapshot' laboratory experiments and are less relevant to real-life attempts to lose weight over time. This suggests other factors are likely to be more important in determining a diet's success.

4. Heatherton and Polivy's spiral model suggests that diet failure leads to a sense of personal deficiency. Food-restricted dieting often begins in adolescence when body dissatisfaction leads to low self-esteem and a desire to lose weight. There is initial success but weight is often regained leading to a sense of personal deficiency and a downward spiral is created where dieters do not radically rethink their approach, instead they make a bigger effort and experience more frustration and emotional distress making them vulnerable to disinhibited eating. The resultant metabolic changes in the body make weight loss physically more difficult and the result is more failure followed by more attempts to 'diet harder', lowering of self-esteem, and an increase in depression.

The spiral model has practical uses and a key lesson of the model is to prevent lowering of self-esteem and thus avoid the worst consequences of diet failure. For example, people who think about *avoiding* putting on weight rather than trying to lose it are less likely to experience disinhibited eating because their self-esteem is higher (Lowe and Kleifield 1988). This may be a better plan for Leander and Uday.

According to ironic process theory, being on a diet increases preoccupation with food and is one reason why people like Leander suggest that diets don't work. The paradoxical outcome of trying to suppress a thought is to make it more likely and dieters label certain foods as 'forbidden' so they stand out. This leads to increased thinking about food and disinhibition of eating, loss of control, excessive food intake and dieting failure.

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Disinhibition theory suggests that dieters make a conscious effort to restrain eating, therefore behaviour is under cognitive control – Uday may well believe this. Dieters tend to experience cognitive distortions and are vulnerable to internal and external food-related cues tempting them to break their diet so research suggests Leander is right and that Uday may thus experience disinhibited eating and consume many calories very quickly – resulting in the dieter losing no more weight than someone not dieting.

Ogden (2010) suggests that disinhibition theory (and other theories claiming dieting is counterproductive) has trouble explaining why some people lose weight even when preoccupied with food. These people are a minority but obviously include people with anorexia who lose weight through restricted eating and people with an internal locus of control. So, disinhibition theory lacks validity because it does not apply to all cases of people dieting to lose weight.

Chapter 10 Stress

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1. The first stage is the alarm reaction. The sympathetic branch of the autonomic nervous system (ANS) is activated by the hypothalamus. This stimulates the adrenal medulla to release adrenaline and noradrenaline to prepare the body for fight or flight.

The second stage is resistance. The body tries to adapt by resisting the stressor. The body's resources are consumed at a harmful rate (e.g. stress hormones become depleted). The parasympathetic branch is activated to conserve energy.

The third stage is exhaustion. The adaptation to the chronic stressor fails because resources needed to resist it are drained. The symptoms of sympathetic arousal (e.g. raised heart rate) damage the adrenal glands and suppress the immune system. Stress-related illnesses (e.g. raised blood pressure, coronary heart disease and depression) are now more likely.

2. If stress becomes chronic the hypothalamic-pituitary-adrenal system (HPA) is now activated, which produces corticotropin releasing factor (CRF). This is detected by the anterior lobe of the pituitary gland and causes the release of adrenocorticotropic hormone (ACTH). ACTH is detected by the adrenal cortex which secretes cortisol. Cortisol is the major stress hormone. It is a glucocorticoid because it affects glucose metabolism by mobilising and restoring energy supplies to fuel the stress response. But it also has other effects that are damaging to the body, such as suppressing the immune system.

HPA is self-regulating via a negative feedback loop – cortisol in the bloodstream is monitored at the pituitary and the hypothalamus. High levels of cortisol trigger reduction in both CRF and ACTH, resulting in a corresponding reduction in cortisol.

3. The sympathomedullary pathway (SAM) controls the fight or flight response and therefore the body's acute, short-term response to a stressor. The hypothalamus activates the sympathetic branch of the ANS, which stimulates the adrenal medulla to release adrenaline and noradrenaline into the bloodstream (heart beats faster, muscles tense, liver converts stored glycogen into glucose to provide energy to fuel fight or flight response). Once the stressor stops, the parasympathetic nervous system is activated and physiological arousal decreases – the priority now is energy conservation, the rest and digest response.

The hypothalamic-pituitary-adrenal system (HPA) controls the body's chronic response to long-term stress. The hypothalamus produces corticotropin releasing factor (CRF). This is detected by the anterior lobe of the pituitary gland and causes the release of adrenocorticotropic hormone (ACTH). ACTH is detected by the adrenal cortex which secretes cortisol. HPA is self-regulating via a negative feedback loop – cortisol in the bloodstream is monitored at the pituitary and the hypothalamus. High levels of cortisol trigger reduction in both CRF and ACTH, resulting in a corresponding reduction in cortisol.

4. In the GAS model, the first stage is the alarm reaction. The sympathetic branch of the autonomic nervous system (ANS) is activated by the hypothalamus. This stimulates the adrenal medulla to release adrenaline and noradrenaline to prepare the body for fight or flight.

The second stage is resistance. The body tries to adapt by resisting the stressor. The body's resources are consumed at a harmful rate (e.g. stress hormones become depleted). The parasympathetic branch is activated to conserve energy.

The third stage is exhaustion. The adaptation to the chronic stressor fails because resources needed to resist it are drained. The symptoms of sympathetic arousal (e.g. raised heart rate) damage the adrenal glands and suppress the immune system. Stress-related illnesses (e.g. raised blood pressure, coronary heart disease and depression) are now more likely.

One strength of the GAS is that there is evidence to support it. Selye (1936) subjected rats to stressors (e.g. extreme cold, surgical injury). He found the same collection of responses ('syndrome') regardless of the stressor. Stress was a general body response appearing after 6–48 hours that was not unique to specific stressor. He tracked response to the stressor through the resistance and exhaustion stages. This suggests the body's general response to a stressor is a physiological reality as Selye argued, at least in rats.

One limitation of the GAS is that it may not be a general response to stressors. Key to the GAS is that the stress response is non-specific (i.e. it is always the same, regardless of the stressor). Mason (1971) replicated Selye's procedures with monkeys. Effects varied depending on the stressor (extreme cold increased urinary cortisol; extreme heat reduced it). This challenges the central concept of Selye's theory by showing specific stressors can produce specific patterns of responses, undermining the validity of the GAS.

The sympathomedullary pathway (SAM) controls the fight or flight response and therefore the body's acute, short-term response to a stressor. The hypothalamus activates the sympathetic branch of the ANS, which stimulates the adrenal medulla to release adrenaline and noradrenaline into the bloodstream (heart beats faster, muscles tense, liver converts stored glycogen into glucose to provide energy to fuel fight or flight response). The hypothalamic-pituitary-adrenal system (HPA) controls the body's chronic response to long-term stress. The hypothalamus produces corticotropin releasing factor (CRF). This is detected by the anterior lobe of the pituitary gland and causes the release of adrenocorticotropic hormone (ACTH). ACTH is detected by the adrenal cortex which secretes cortisol.

A limitation of research into this physiological stress response is that psychological factors are ignored. Cognitive appraisal was demonstrated in Speisman *et al*.'s (1964) study, in which students watched a gruesome medical procedure on film while their heart rates were measured. If the traumatic nature of operation was emphasised, heart rates increased; if described as a voluntary rite of passage, heart rates decreased. It is difficult for a purely physiological explanation to account for this finding.

A strength of research is that it offers real-world benefits. Addison's disease is rare disorder of the adrenal glands (people cannot produce cortisol). Stress can trigger a life-threatening Addisonian crisis (confusion, abnormal heart rhythm, drop in blood pressure). This can be treated with self-administered cortisol replacement therapy which allows people to lead relatively normal lives. Therefore a better understanding of stress physiology has improved the lives of some people.

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1. Immunosuppression occurs when stress prevents the immune system from carrying out its usual task of identifying and destroying antigens. Stress can cause immunosuppression directly (cortisol inhibits production of immune cells) or indirectly (lifestyle behaviours).

Cardiovascular disorders (CVDs) are disorders of the heart and blood vessels – including coronary heart disease (CHD) and stroke (blocked blood vessels in the brain). Some evidence shows stress has immediate effects on CVDs (acute) as well as longer-term effects (chronic).

2. Wilbert-Lampen *et al*. (2008) found that on the days Germany played in the 1996 football World Cup, cardiac emergencies in Germany increased by 2.66 times compared with a control period. The acute emotional stress of watching a favourite football team more than doubled participants' risk of a cardiovascular event. Yusuf *et al*. (2004) found that there are several chronic stressors linked to CVDs including workplace stress and stressful life events (a greater contribution than obesity). These contribute to the development of CVDs but they also make existing disorders worse.

3. One limitation is that some research shows that stress can be protective. An assumption underlying stress and illness research is that stress suppresses the immune system. But some studies show stress can have immune-enhancing effects. Dharbhar (2008) subjected rats to mild stressors which stimulated a major immune response. Immune cells (e.g. lymphocytes) flooded into the bloodstream and body tissues to protect against acute stress – chronic stress may be more damaging. This suggests that the relationship between stress, the immune system and illnesses is complex and not yet fully understood.

4. Immunosuppression through stress can occur directly. Cortisol produced by the hypothalamic-pituitary-adrenal system (HPA) inhibits the production of immune cells. It can also occur indirectly as stress influences lifestyle behaviours (smoking, drinking) that have a negative effect on immune functioning. Kiecolt-Glaser *et al*. (1984) obtained blood samples from 75 medical students, tested before the exam period (low-stress) and on the day of the first exam (high-stress). They also completed questionnaires measuring sources of stress and self-reported psychological symptoms. The activity of natural killer (NK) and killer T cells decreased between the first and second samples – and this was evidence of an immune response suppressed by a common stressor. Decline was greatest in those students who reported feeling lonely and who were experiencing other sources of stress (e.g. life events). Immunosuppression may explain Fabrizio's sniffles, aches and pains as his recent experiences have reduced immune functioning.

CVDs are disorders of the heart and blood vessels – including coronary heart disease (CHD) and stroke (blocked blood vessels in the brain). Some evidence shows stress has immediate effects on CVDs (acute) as well as longer-term effects (chronic). It is worrying that Fabrizio is experiencing an irregular heartbeat, which suggests chronic stress may be having long-term effects, and he may be more susceptible to cardiovascular disorder.

One limitation is that some research shows that stress can be protective, which does not appear to be Fabrizio's experience. An assumption underlying stress and illness research is that stress suppresses the immune system. But some studies show stress can have immune-enhancing effects. Dharbhar (2008) subjected rats to mild stressors which stimulated a major immune response. Immune cells (e.g. lymphocytes) flooded into the bloodstream and body tissues to protect against acute stress – chronic stress may be more damaging. This suggests that the relationship between stress, the immune system and illnesses is complex and not yet fully understood.

Another limitation is the effects of stress on CVDs are mostly indirect. The evidence for stress as an indirect factor in CVDs is much stronger than evidence that it directly causes CVDs. Stress can increase the risk of heart attack in people who already have CVDs. Orth Gomer *et al*. (2000) found that marital conflict for women with CVDs created stress that tripled the risk of heart attack. This suggests that stress increases vulnerability to CVDs, mainly through indirect effects (e.g. lifestyle).

Perhaps the source of Fabrizio's problems lies elsewhere (his relationship?) and this job loss has made it worse.

However there is some evidence that chronic stressors are linked to CVDs. Yusuf *et al*. (2004) conducted the INTERHEART study across 53 countries. They found that there are several chronic stressors linked to CVDs including workplace stress and stressful life events (a greater contribution than obesity). These contribute to the development of CVDs but they also make existing disorders worse. This research confirms that Fabrizio's girlfriend may be right and he is experiencing a chronic response to the stressful life event of losing his job. This is of great concern given that he has an irregular heartbeat.

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1. Major sources of stress are the really important things that happen to us from time to time. For example, getting married/divorced, when a close relative dies, changes to financial state (better or worse), when a new child is born. Life changes are stressful because you make major psychological adjustment to adapt to changed circumstances – the bigger the change, the greater the adjustment and associated stress. Life changes are cumulative – they add together to create more stress because they require even more change to adapt. This applies as much in relation to positive life changes as to negative ones.

2. Rahe *et al*. (1970) found a significant positive correlation (of +.118) between LCU scores of navy personnel for the six months prior to departure and illness scores aboard ship. Those who experienced the most stressful life changes in the final six months before leaving had the most (severe) illnesses on ship. The researchers concluded that life changes were a reasonably robust predictor of later illness. Lietzén *et al*. (2011) found that having a high level of life change stress was a reliable predictor of asthma onset. This link could not be explained by other well-established common risk factors such as smoking or having a pet at home.

3. One strength of the life changes concept is supportive research evidence. Lietzén *et al*. (2011) found a high level of life change was a reliable predictor of asthma onset. This link was not explained by known risk factors (e.g. pet at home or smoking). This study suggests that stressful life changes can contribute to the onset of a chronic illness.

One limitation of life changes research is it ignores individual differences. Stress is perceived differently by different individuals, e.g. moving house will be more stressful to somebody when it is due to a lack of money rather than as a result of being better off. Byrne and Whyte (1980) tried to predict who would experience myocardial infarction (heart attack) based on SRRS scores. This only worked when they took into account the subjective interpretations that participants gave to their life changes. This suggests that the classic life changes approach fails to consider the impact of individual differences in how life changes are perceived, reducing the validity of this approach as an explanation of stress.

4. Major sources of stress are the really important things that happen to us from time to time. For example, getting married/divorced, when a close relative dies, changes to financial state (better or worse), when a new child is born. Life changes are stressful because you make major psychological adjustment to adapt to changed circumstances – the bigger the change, the greater the adjustment and associated stress. Life changes are cumulative – they add together to create more stress because they require even more change to adapt. This applies as much in relation to positive life changes as to negative ones. This can be related to Tad and Tadita's experiences. Even though some of the life changes they have experienced are positive, all life changes require significant

psychological adjustment. The cumulative effect of these will mean that both will have experienced a considerable amount of stress.

Holmes and Rahe's (1967) Social readjustment rating scale (SRRS) gives number of life change units (LCUs). The higher the LCU value, the more adjustment the life change needs, making it more stressful (e.g. divorce is 73 LCUs, marriage is 50). Participants tick all the life changes they recall over previous months (usually 12). We can assume that Tad and Tadita would score highly on the SRRS, and a high score is correlated with high experience of stress.

One strength of the life changes concept is supportive research evidence. Lietzén *et al*. (2011) found a high level of life change was a reliable predictor of asthma onset. This link was not explained by known risk factors (e.g. pet at home or smoking). This study suggests that stressful life changes can contribute to the onset of a chronic illness. All this research confirms that it is events in Tad and Tadita's lives that have caused them stress.

However, one limitation of life changes research is it ignores individual differences. Stress is perceived differently by different individuals. For example, the stress Tadita felt because she became pregnant depends on various things, such as whether it was planned or unexpected. Byrne and Whyte (1980) tried to predict who would experience myocardial infarction (heart attack) based on SRRS scores. This only worked when they took into account the subjective interpretations that participants gave to their life changes. This suggests that the classic life changes approach fails to consider the impact of individual differences in how life changes are perceived, reducing the validity of this approach as an explanation of stress. Although Tad and Tadita have experienced stress from life events, it is very unlikely they will have done so to the same extent.

Another limitation of life changes research is it assumes all change is stressful. The SRRS mixes together different types of life changes (e.g. positive and negative). But positive and negative changes may have different effects. Turner and Wheaton (1995) found negative life changes caused most stress measured by the SRRS. This could be due to frustration associated with negative life changes. Depending on his exact circumstances, Tad will have found moving house particularly stressful because it was the result of relationship breakdown. On the other hand Tadita got married, which presumably was a positive life change. This challenges the validity of the life changes approach, because positive and negative life changes have different effects.

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1. The differences are mainly in terms of frequency and severity.

Daily hassles are frequent and everyday irritations and frustrations. They range from minor inconveniences (e.g. can't find keys) to greater pressures and difficulties (e.g. not enough time). Each hassle on its own does not have the impact of a significant life change, but their added effects leave us feeling stressed.

Life changes are major events in a person's life that happen much less often than daily hassles but may be more stressful because they require significant psychological adjustment (e.g. getting married, losing one's job or experiencing a bereavement).

2. Kanner *et al*. (1981) found significant positive correlations between hassle frequency and psychological symptoms at the start and end of the study. The more hassles the participants experienced the more severe were the psychological symptoms of depression and anxiety. Hassles were a stronger predictor of psychological symptoms than life changes both during the ten months

of the study and from 2½ years earlier. Ivancevich (1986) showed that daily hassles are strong predictors of poor health, poor job performance and absenteeism from work. Relatively minor everyday stressors can accumulate and have significant effects in the workplace.

3. One strength is the daily hassles concept has research evidence to support it. Ivancevich (1986) found that daily hassles were strong predictors of poor health, poor job performance and absenteeism from work. There is a substantial body of research to suggest that daily hassles are a more valid explanation of stress than life changes.

However, Ivancevich's study (and others) was based on retrospective self-report. Participants had to recall daily hassles from over the previous month. Because they are relatively minor, hassles are easily forgotten or their significance could be misremembered and exaggerated. This means the validity of some hassles research might be doubtful.

4. According to Lazarus *et al*. (1980) daily hassles range from minor inconveniences (e.g. can't find keys) to greater pressures and difficulties (e.g. not enough time). Each hassle on its own does not have the impact of a significant life change – but their added effects leave us feeling stressed.

Stressfulness of daily hassles depends on psychological appraisal. Lazarus argued that when we experience a hassle we engage in primary appraisal – we work out subjectively how threatening it is to our psychological health. If we deem that the hassle is threatening we engage in secondary appraisal – we subjectively consider how well equipped we are to cope with the hassle.

The Hassles and uplifts scale (HSUP) is a self-report measure of how many hassles are experienced and how severe they are, as well as uplifts – the small, daily pleasant and enjoyable things that offset the stress of hassles (e.g. getting on well with friends).

Effects of life changes and daily hassles are different. Life changes have indirect effects – they are distal sources of stress. Daily hassles have direct and immediate effects on our everyday lives – they are proximal sources of stress.

One strength is the daily hassles concept has research evidence to support it. Ivancevich (1986) found that daily hassles were strong predictors of poor health, poor job performance and absenteeism from work. There is a substantial body of research to suggest that daily hassles are a more valid explanation of stress than life changes.

However, Ivancevich's study (and others) was based on retrospective self-report. Participants had to recall daily hassles from over the previous month. Because they are relatively minor, hassles are easily forgotten or their significance could be misremembered and exaggerated. This means the validity of some hassles research might be doubtful.

Another limitation is that hassles research is mostly correlational. There are many studies showing strong positive correlations between stress, hassles and various outcomes. But even the strongest correlation does not demonstrate causation. Because another, unmeasured, factor may be involved, we cannot conclude that hassles cause stress. For instance, people who are depressed may experience daily hassles intensely and at the same time feel stressed. Hassles and stress appear to be linked, but it is the depression that is causal. Therefore the link between hassles, stress and illness may be indirect and depend on other factors.

On the other hand, a strength of hassles research is that it can account for individual differences. Lazarus emphasises that how stressful a hassle is depends on how we interpret it. For example, one

person who loses their keys will perceive it as a disaster, but another person will not. This is primary appraisal. One person believes they can cope, but the other falls to pieces. This is secondary appraisal. Therefore the daily hassles approach incorporates the idea that people differ in their perception of what makes a hassle and this has differing effects on our health and behaviour.

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1. Workload refers to the demands a job makes on an employee. Some jobs make great demands of time and/or effort and so an employee will experience overload. Conversely, other employees might experience underload because their jobs are relatively undemanding.

Control is the degree of freedom an employee has to perform their job how they wish. For example, he or she may have greater leeway to make decisions or take longer to perform a task or determine the steps involved in doing so.

2. Research has shown that high workload and a lack of control are both stressful in the workplace.

In the Whitehall Studies, Bosma *et al*. (1997) showed that employees who reported low job control at the start of the study were more likely to have coronary heart disease five years later. This was true even when other risk factors (e.g. lifestyle, diet) were statistically accounted for and also was found across all job grades. If a job lacks control, higher status does not reduce the risks of stress to health.

Johansson *et al*. (1978) found that 'finishers' in a Swedish sawmill had higher levels of stress hormones than cleaners. Their hormone levels were higher even before they got to work and increased over the day (whereas the cleaners' levels decreased). Finishers also experienced more stress-related illness and absenteeism. The key difference was that finishers had much less control over their work than the cleaners did.

3. One limitation of the job demands-control model is that it is simplistic. Lack of control is a significant stressor for many workers (at least in some cultures) but is not the only one. How much stress a worker experiences is the outcome of a complex interaction between the kind of work they do, how well they use coping mechanisms and their perception of how much control they have. The job demands-control model ignores other factors and lacks validity because of a simplistic focus on just control and workload.

Another limitation is the model may not explain cultural differences. Györkös *et al*. (2012) reviewed cross-cultural studies and found a lack of job control was perceived as more stressful in individualist cultures (e.g. UK and US). However, in collectivist cultures (e.g. China and other Asian countries) control was considered less desirable. The concept of job control may be a culture-specific notion reflecting individualist ideals of equity and personal rights. It may not generalise to collectivist cultures which prioritise the good of wider society.

4. The newspaper item reflects the view of Karasek (1979) in his job demands-control model of workplace stress. The article and the model state that the demands of a job (e.g. work overload) can lead to poor health, dissatisfaction, and absenteeism. But this relationship depends upon the amount of control an employee has over their work. So when two people have equally demanding jobs (because the workload is too great) only the one who lacks control becomes ill. According to Karasek, having control acts as a 'buffer' against the negative effects of job overload.

The key sources of stress identified by the newspaper article have been explored in two major studies.

Bosma *et al*. (1997) investigated control in the Whitehall Studies, prospective studies of over 10,000 civil servants in a wide range of job grades. The researchers found that employees who reported low job control at the start of the study were more likely to have CHD five years later – even when other risk factors (e.g. lifestyle, diet) were statistically accounted for. This finding also existed across all job grades – status and support given to higher grade civil servants did not offset risk of developing CHD if the job lacked control.

Johansson *et al*. (1978) investigated workload, control and stress. A natural experiment was conducted in a Swedish sawmill which compared a group of wood 'finishers' and a group of cleaners. Measures of employee illness, absenteeism, and levels of the stress hormones adrenaline and noradrenaline were taken. Finishers had little control over their work because it was dictated by the machine – but job demands were high because it was complex, skilled and carried a lot of responsibility. The researchers found higher level of stress hormones in finishers overall – higher even before they got to work and increased over the day (but cleaners' levels decreased). There was more stress-related illness and absenteeism among finishers.

So overall the research picture is slightly different from the view offered by the newspaper item. It appears that having 'too much work to do' is not as stressful as having low job control. However, both studies provide support for the newspaper's view that lack of job control is potentially dangerous, especially the Whitehall Studies because they were prospective and showed that lack of control predicts negative outcomes.

One limitation of the job demands-control model is that it is simplistic. Lack of control is a significant stressor for many workers (at least in some cultures) but is not the only one. How much stress a worker experiences is the outcome of a complex interaction between the kind of work they do, how well they use coping mechanisms and their perception of how much control they have. The job demands-control model ignores other factors and lacks validity because of a simplistic focus on just control and workload. The newspaper article is therefore equally simplistic in failing to highlight other potential sources of stress.

Another limitation is the model may not explain cultural differences. Györkös *et al*. (2012) reviewed cross-cultural studies and found a lack of job control was perceived as more stressful in individualist cultures (e.g. UK and US). However, in collectivist cultures (e.g. China and other Asian countries) control was considered less desirable. The concept of job control may be a culture-specific notion reflecting individualist ideals of equity and personal rights. It may not generalise to collectivist cultures which prioritise the good of wider society. The newspaper article is taking a very narrow view of what is meant by job control.

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1. The main difference is that one is a subjective measure and the other is objective.

Self-report scales measure subjective judgements of stress using questionnaires, such as the SRRS. They provide valuable information about psychological factors linked to stress.

Physiological measures (e.g. the skin conductance response) monitor the effects of the autonomic nervous system and are therefore objective measures of stress. These are more difficult to 'fake' because there is less risk of social desirability of response.

2. One consequence of stress is that we sweat more – human skin is a good conductor of electricity and sweat enhances that – the more we sweat, the more conductance there is. To measure conductance, electrodes are attached to the index and middle fingers of one hand to detect sweating. A tiny current (cannot be felt) is applied to electrodes to measure how much electricity is conducted. Conductance can be measured (in microSiemens) – the signal is amplified and displayed on a screen. Tonic conductance is a baseline measure taken when we are not experiencing a stressful stimulus. It is compared against phasic conductance, which occurs when a stimulus is applied.

3. One strength of self-report is that it is a valid way to measure stress. Stress is personal so the best way to understand it is to ask people about their experiences. Asking questions about experiences 'makes sense' to people as a way to measure stress, so people are more honest. Therefore the findings of studies based on self-report measures are true reflections of the stress participants feel.

However, Dohrenwend *et al.* (1990) found that the most stressed people made the most negative interpretations of scale items (e.g. 'Serious illness'). This means there is an inbuilt bias that inflates stress scores and reduces the validity of self-report measures.

One limitation is that self-report scales mix causes and effects of stress. SRRS and HSUP items (causes of stress) overlap with symptoms (effects of stress), e.g. 'Personal injury or illness' (SRRS). This is like saying, 'You have a stress-related illness because you are experiencing a personal illness' – scales reflect illness, they do not predict it. This is why self-report measures should be abandoned and replaced by direct observations of behaviour.

4. Self-report measures of stress include the Social readjustment rating scale (SRRS) created by Holmes and Rahe (1967). It uses medical records to identify events in patients' lives that happened not long before they became ill. There are 43 life events, and a life change unit (LCU) score is provided for each as a measure of stress. The LCU was calculated for each life event by asking a group of people to estimate readjustment required for each event, using marriage (500 units) as a baseline. The SRRS is used by asking participants to indicate which life events they have experienced in the past 12 months – LCUs for these are added to give an overall (global) stress score.

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Physiological measures of stress measure arousal in the autonomic nervous system (ANS) which is produced by stress. One consequence is that we sweat more – human skin is a good conductor of electricity and sweat enhances that – the more we sweat, the more conductance there is. To

measure conductance, electrodes are attached to the index and middle fingers of one hand to detect sweating. A tiny current (cannot be felt) is applied to electrodes to measure how much electricity is conducted. Conductance can be measured (in microSiemens) – the signal is amplified and displayed on a screen.

A limitation of SCRs is individual differences. SCR measurement recognises people have different patterns of skin conductance, so a baseline measure (tonic conductance) is taken before a stimulus is presented. However, some people are stabiles (SCRs vary little when they are at rest, and are not much influenced by internal thoughts or external events). Others are labiles (produce a lot of SCRs even when resting). This suggests the SCR measurement is not a straightforward matter of comparing baseline SCRs (tonic) against stimulated SCRs (phasic).

However, one strength of SCRs (and other physiological measures) is that they are not affected by personal biases. Skin conductance, blood pressure and hormone secretion are all reliably associated with stress. As noted above, physiological measures have a 'baseline' which varies from person to person. But this can be accounted for and as long as it is physiological measures are free of the biases that affect self-reports (e.g. cortisol levels are not affected by social desirability but SRRS scores are). This means that physiological measures are considered to be more scientific measures of the body's physiological stress response.

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1. Friedman and Rosenman identified the characteristics of Type B personality – relaxed, tolerant, reflective, 'laid back' and less competitive than Type As. Type C people demonstrate pathological niceness, are 'people pleasers', compliant, passive and self-sacrificing. They avoid conflict by repressing emotions, especially anger (particularly relevant to cancer-proneness). Temoshok (1987) proposed Type C is linked with cancer.

2. Friedman and Rosenman (1959) conducted the Western collaborative group study (WCGS) on 3000 males in California who were medically assessed as free of coronary heart disease (CHD) at the start of the study. They were assessed for personality type by answering 25 questions in a structured interview. The interviews were conducted to incite Type A-related behaviour (e.g. the interviewer would be aggressive and frequently interrupt the participants). Eight-and-a-half years later Friedman and Rosenman (1974), 257 men had developed CHD. 70% of these had been assessed at the start of the study as Type A – considerably more than the Type Bs who developed CHD. Type As had higher levels of adrenaline and noradrenaline and higher blood pressure and cholesterol. This suggests that Type A personality makes people vulnerable to stressors because impatience and hostility cause raised physiological stress response.

3. Friedman and Rosenman's (1974) study used an interview procedure. 3000 males in California were medically assessed as free of coronary heart disease at the start of the study. They were assessed for personality type by answering 25 questions in a structured interview. The interviews were conducted to incite Type A-related behaviour (e.g. the interviewer would be aggressive and frequently interrupt).

Dattore *et al*. (1980) used a different methodology to assess Type C – self-report questionnaires. They studied 200 veterans of the Vietnam War, 75 of whom were cancer patients and the rest formed a control group of people with non-cancer diagnoses. They had all completed scales to measure repression of emotions and symptoms of depression several years before they were diagnosed. So, like the Friedman and Rosenman study, this was prospective.

4. Friedman and Rosenman (1959) observed that patients with coronary heart disease (CHD) shared a pattern of behaviour, which they called Type A personality: competitive (driven, achievement-motivated, ambitious, aware of status), time urgent (fast-talking, impatient, proactive, multitaskers), and hostile (aggressive, intolerant and quick to anger). Characteristics of a Type B personality are being relaxed, tolerant, reflective, 'laid back' and less competitive than Type As. Type C people demonstrate pathological niceness, are 'people pleasers', compliant, passive and self-sacrificing. They avoid conflict by repressing emotions, especially anger (particularly relevant to cancer-proneness). Temoshok (1987) proposed Type C is linked with cancer.

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One strength of the Type A/B concept is that it can be used practically to improve health-related outcomes. For example, Ragland and Brand (1988) followed up men from Friedman and Rosenman's original study who had survived a heart attack. Type B survivors were more likely to die after several years than Type As. This was an unexpected result but one explanation for this is that Type As were more likely to change their behaviour after surviving the first heart attack (e.g. becoming less driven, ambitious, busy, etc.) and thus avoiding stress. This suggest that research findings can be used to convince Type As to change and live longer.

However, the same study also highlights how some of the research is gender-biased. All of the participants were men (and in the original study), which means some of our knowledge of the role of personality is based on the male stress response. This might be of less relevance to women. This is an example of beta bias, or applying findings from males to females without further testing. This means that practical advice about surviving CVDs may not work as well for women as it does for men.

Another limitation of the Type A concept is that it is too broad. Type A personality includes too many different traits. Research focus moved to the hostility component of Type A (hostile people are selfish, manipulative, mistrusting and contemptuous) to explain the link between stress and CHD. Carmelli *et al.* (1991) found very high CHD-related deaths after 27 years in a subgroup of WCGS men with high hostility scores. Therefore, it looks like it is not the broad Type A personality that is linked to illness but the narrower hostility component.

Evidence suggests two distinct personality types (A and B) that respond to stress differently. Type As are more likely to deal with stress in a way that harms their health. However, other evidence shows this link is weak and correlational – inconsistent and contradictory findings suggest the Type A/B distinction is blurred. Therefore Type A is no longer a particularly useful concept because it cannot be used to predict who will become ill in response to stress.

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1. Commitment: hardy people are deeply involved in relationships, activities and themselves. They throw themselves wholeheartedly into life, optimistic they will learn something valuable.

Challenge: hardy people are resilient and welcome change as an opportunity or a challenge rather than a threat. They recognise life is unpredictable, but this is exciting and stimulating.

Control: hardy people have a strong belief that they are in charge of events. They actively strive to influence environments rather than being powerless and passive observers of life passing by.

2. Kobasa (1979) used the Schedule of recent experiences (forerunner to the SRRS) to measure life events in male American managers. She also measured illness and noted the number of days taken off work. Many managers who experienced high levels of stress over the previous three years became ill with a high level of absenteeism. But some of them coped with stress without becoming ill. They all scored highly on measures of challenge, commitment and control (i.e. hardiness).

Maddi (1987) studied managers and supervisors at an American company that went through one of the biggest reorganisations in history. It was extremely stressful for people who were fortunate enough to keep their jobs. About two-thirds of the managers had significant declines in performance and health, including CVDs, depression and drug abuse. But the other third flourished, they felt happier and more satisfied at work and were energised by the stress. Again these were the ones who scored highly on the Three Cs. They saw the stressful events as a challenge which they could control and worked at being committed to change.

3. One limitation is that the concept of hardiness may be too broad. Hull *et al*. (1987) argued that research should focus on control, as research shows it is so important to well-being. And to a lesser extent, commitment. However, Contrada (1989) claims that challenge is the most important component of hardiness. This suggests the concept of hardiness is so broad it has very little validity and may not exist at all.

One strength is that many research studies show that hardiness has an important role in how we respond to stressors. An example is a study by Contrada (1989) who studied the cardiovascular responses of male students to a stressful laboratory task. Students who scored highly on a measure of hardiness had a lower resting blood pressure in response to the task. The students with the lowest blood pressure also had Type B personalities, which shows that hardiness interacts with other individual differences. This shows that hardiness affects the physiological stress response and may protect from some stress-related illnesses.

4. Kobasa (1979) proposed hardiness is a set of personality characteristics that protect us against stress. Maddi (1986) argues hardiness gives us 'existential courage' – the will or determination to keep going despite the setbacks life throws at us and uncertainties about the future.

There are three dimensions to hardiness: commitment, challenge, control.
Commitment: hardy people are deeply involved in relationships, activities and themselves. They throw themselves wholeheartedly into life, optimistic they will learn something valuable.
Challenge: hardy people are resilient and welcome change as an opportunity or a challenge rather than a threat. They recognise life is unpredictable, but this is exciting and stimulating.
Control: hardy people have a strong belief that they are in charge of events. They actively strive to influence environments rather than being powerless and passive observers of life passing by.

It would appear that Padraig is a 'hardy' individual as he sees the changes at work as an opportunity rather than a stressor (this links to one of the Three C's – challenge). His desire to work hard relates to the concept of commitment. Finally, he appears to be in control of events and his reaction to the changes, rather than being controlled by them. For this reason, he is likely to have the existential courage to cope with the changing circumstances.

A strength is research support for the hardiness concept. For example, Maddi (1987) studied managers and supervisors at an American company that went through one of the biggest reorganisations in history, mirroring the events at Padraig's college. It was extremely stressful for people who were fortunate enough to keep their jobs. About two-thirds of the managers experienced poor performance and ill health, including CVDs, depression and drug abuse. But, like Padraig, the other third flourished, they felt happier and more satisfied at work and were energised by the stress. These were the ones who scored highly on the Three Cs, as Padraig probably would if he were to be assessed. They saw the stressful events as a challenge which they could control and worked at being committed to change.

Another strength is that it may be possible to develop hardiness in the real world. Maddi and Kobasa have worked with many organisations to increase challenge, control and commitment in employees to help reduce the effects of stress. This may be of benefit not so much to Padraig but to some of his colleagues who are overwhelmed by the stress of the reorganisation. Therefore being able to develop hardiness in some people could help them to respond more positively to stress and prevent poor health, absenteeism and poor performance.

One limitation is that the concept of hardiness may be too broad. There seems to be an element of control at the heart of both commitment and challenge. It could be that Padraig's positive response is entirely due to his feeling of control rather than to a vague concept of hardiness. Hull *et al*. (1987) argued that research should focus on control, as research shows it is so important to well-being. And to a lesser extent, commitment. However, Contrada (1989) claims that challenge is the most important component of hardiness. This suggests the concept of hardiness is so broad it has very little validity and may not exist at all.

Page 175

1. Drug therapy is treatment of stress that involves chemicals that affect the functioning of the brain and nervous system. For example, benzodiazepines (e.g. diazepam) reduce the anxiety associated with stress by reducing central nervous system (CNS) arousal. They tap into one way the body naturally combats anxiety. The mode of action of BZs involves GABA, which is a neurotransmitter that inhibits activity of most neurons in the brain. During synaptic transmission, GABA combines with receptors on the postsynaptic neuron. This makes it less likely that the postsynaptic neuron will fire so neural activity is slowed. BZs enhance this natural inhibition, lowering CNS activity even further.

2. Benzodiazepines (e.g. diazepam) reduce the anxiety associated with stress by reducing central nervous system (CNS) arousal. They tap into one way the body naturally combats anxiety. The mode of action of BZs involves GABA, which is a neurotransmitter that inhibits activity of most neurons in the brain. During synaptic transmission, GABA combines with receptors on the postsynaptic neuron. This makes it less likely that the postsynaptic neuron will fire so neural activity is slowed. BZs enhance this natural inhibition, lowering CNS activity even further.

Beta-adrenergic blockers (beta blockers or BBs) act on the sympathetic nervous system to reduce sympathetic arousal, a key part of stress-related anxiety. BBs (e.g. atenolol) are prescribed to reduce blood pressure and treat heart problems. BBs stop beta-adrenergic receptors being stimulated by

adrenaline and noradrenaline. This slows heart rate, reduces blood pressure, etc., reducing the need for oxygen. BBs reduce stress-related anxiety without altering alertness because they don't operate directly on the brain. So they are ideal for people who want to eliminate physical symptoms of stress but remain alert (e.g. stage performers, surgeons).

3. One strength of BZs is high-quality research evidence that shows they are effective. In a double-blind placebo-controlled trial, half the participants take a placebo (an inactive version of the drug) but neither they nor the researcher knows who is taking it. A review of high-quality studies by Baldwin *et al*. (2013) concluded there is good evidence that BZs are significantly more effective than placebo in reducing acute anxiety. This is strong evidence that BZs are a good choice of drug treatment for people wishing to reduce anxiety, at least in the short term.

One strength of BBs is that research evidence shows they are effective. Kelly (1980) concluded that BBs were effective for treating everyday anxieties associated with public speaking, exam nerves and even civil disturbances of living in Northern Ireland in the 1970s. Studies consistently demonstrate BBs may be even more effective when used with other drugs such as BZs (Hayes and Schulz 1987). Therefore, drug combination therapy with BBs and BZs may be the best way to treat the physiological symptoms of stress for most people.

One limitation of drug therapy is side effects. BZs can cause breathing problems and paradoxical reactions (opposite effects) e.g. impulsive behaviours and uncontrollable emotions (Gaind and Jacoby 1978). BBs may reduce heart rate and blood pressure too much in some people, and so are not suitable for people with diabetes or severe depression. Therefore side effects are problematic because, as a consequence, a person may stop taking the drug making them ineffective.

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Drugs have costs because of side effects and dependency is an issue because BZs are addictive with long-term use. Drugs also do not offer a cure for anxiety/stress. However, there are benefits because they give short-term relief, which means psychological therapies can be used. They are also cost-effective and non-disruptive. Therefore the benefits outweigh the costs as long as anti-anxiety drugs are only used to relieve short-term stress.

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1. Stress inoculation therapy is a form of cognitive behaviour therapy which is based on the idea that the way in which people cognitively appraise a situation determines their stress level. In contrast, drug therapy works on the idea that the best way to tackle stress is to target the physiological effects associated with it.

2. There are three phases involved in SIT. In the conceptualisation phase, the client and therapist work together to identify and understand the stressors the client faces. The client is educated about the nature of stress and its effects. There should be a warm and collaborative rapport between therapist and client.

In the skills acquisition and rehearsal phase, the client learns skills to cope with stress (e.g. relaxation, social skills, communication, cognitive restructuring). The major element of skills acquisition is learning to monitor and use self-talk. The client uses coping self-statements ('You can do this!', 'Stick to the plan!') to replace anxious internal dialogue. The client plans in advance how to cope using their learnt skills when stress occurs.

In the real-life application and follow-through phase, the therapist creates opportunities for the client to try out skills in a safe environment. Various techniques are used to increase realism of stressful situations (e.g. role playing, visualisation, virtual reality, mobile apps). Learned skills are gradually transferred to the real world through homework tasks for the client to deliberately seek out moderately stressful situations and use their coping skills in everyday life ('personal experiments'). The client later feeds back to the therapist for discussion and further work if necessary.

3. One strength of SIT is its flexibility. SIT incorporates a wide variety of stress management techniques in the skills acquisition phase. It can be used with individuals, couples, groups and in a variety of settings. This means techniques can be tailored to specific needs – some skills are more suitable for elderly people or people with learning difficulties. SIT can even be adapted for use online. This suggests that SIT is so flexible it has the potential to be an effective method of managing any form of stress.

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the brain. During synaptic transmission, GABA combines with receptors on the postsynaptic neuron. This makes it less likely that the postsynaptic neuron will fire so neural activity is slowed. BZs enhance this natural inhibition, lowering CNS activity even further.

One strength of BZs is high-quality research evidence that shows they are effective. In a double-blind placebo-controlled trial, half the participants take a placebo (an inactive version of the drug) but neither they nor the researcher knows who is taking it. A review of high-quality studies by Baldwin *et al*. (2013) concluded there is good evidence that BZs are significantly more effective than placebo in reducing acute anxiety. This is strong evidence that BZs are a good choice of drug treatment for people wishing to reduce anxiety, at least in the short term.

One limitation of all drug therapies is side effects. Side effects of anti-stress drugs include drowsiness, respiration problems and paradoxical reactions (opposite outcomes to ones you expect from treatment, e.g. impulsive behaviours, uncontrollable emotional responses). BBs also reduce heart rate and blood pressure too much in some individuals and are not suitable for people with diabetes or severe depression. A person might stop taking the drug because of side effects, so anxiety symptoms return. This means that side effects need to be carefully weighed up against the benefits of the drug, and also against alternatives including psychological therapies (e.g. stress inoculation therapy).

Stress inoculation therapy is a form of cognitive behaviour therapy which is based on the idea that the way in which people cognitively appraise a situation determines their stress level. There are three phases involved in SIT: conceptualisation (the client and therapist work together to identify and understand stressors the client faces), skills acquisition and rehearsal (the client learns skills to cope with stress, e.g. relaxation, social skills, communication, cognitive restructuring), real-life application and follow-through (the therapist creates opportunities for the client to try out skills in a safe environment).

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One limitation of SIT is that it is a very demanding therapy. Clients must make big commitments of time and effort and be highly motivated. Training can be lengthy and involves self-reflection and learning new skills. Applying SIT techniques to real life is especially challenging – some people find it difficult to use coping self-statements when experiencing the anxiety of a stressful situation. These demands and sense of failure mean some people don't continue treatment, making it unsuccessful in many cases.

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1. The main difference concerns the role of cognitive factors. Stress inoculation therapy is a form of cognitive behaviour therapy which is based on the idea that the way in which people cognitively appraise a situation determines their stress level. Biofeedback trains people to control involuntary physiological processes (e.g. heart rate, muscle tension). The client is connected to a machine which converts physiological activity into visual and/or auditory signals. There is no emphasis placed on cognitive factors.

2. Biofeedback trains people to control involuntary physiological processes (e.g. heart rate, muscle tension) by connecting them to machines that give visual and/or auditory feedback of the processes (e.g. a tone representing muscular tension).

Phase 1 of training is an educational phase with a lot of input from the trainer/therapist. The client learns to become aware of their physiological responses.

In Phase 2 the client applies learned stress management techniques. The client monitors the effect of changes – for example, they can see that changed breathing causes a change on a visual display in the desired direction (e.g. altering the line of the graph). Biofeedback from the machine is rewarding and reinforces the client's behaviour, making further success more likely (i.e. operant conditioning).

In Phase 3, once the client becomes aware of their physiological response and how to control it (e.g. reducing heart rate), they transfer control to everyday life. They practise stress management techniques in stressful situations rather than in the therapy room.

3. One strength of biofeedback is research evidence. Lemaire *et al*. (2011) trained medical doctors to use a biofeedback device three times a day over a 28-day period. The doctors also completed a questionnaire measuring perception of how stressed they were. Mean stress score for biofeedback users fell significantly over the course of the study. The corresponding score for a control group also fell but by a much smaller amount. This suggests biofeedback has benefits in helping to improve the psychological state of someone experiencing stress.

One limitation of biofeedback is its effectiveness depends on what is measured. Lemaire *et al*. (2011) found that biofeedback had very little effect on objective, physiological indicators of the stress response (e.g. blood pressure) – no more so than placebo. Therefore the effectiveness of biofeedback depends on the outcome measure, what it is you actually aim to 'treat'.

4. Benzodiazepines (e.g. diazepam) reduce the anxiety associated with stress by reducing central nervous system (CNS) arousal. They tap into one way the body naturally combats anxiety. The mode of action of BZs involves GABA, which is a neurotransmitter that inhibits activity of most neurons in the brain. During synaptic transmission, GABA combines with receptors on the postsynaptic neuron. This makes it less likely that the postsynaptic neuron will fire so neural activity is slowed. BZs enhance this natural inhibition, lowering CNS activity even further.

One strength of BZs is high-quality research evidence that shows they are effective. In a double-blind placebo-controlled trial, half the participants take a placebo (an inactive version of the drug) but neither they nor the researcher knows who is taking it. A review of high-quality studies by Baldwin *et al*. (2013) concluded there is good evidence that BZs are significantly more effective than placebo in reducing acute anxiety. This is strong evidence that BZs are a good choice of drug treatment for people wishing to reduce anxiety, at least in the short term. This is strong support for Parveneh's statement that drugs are effective for 'most people'.

However, one limitation of all drug therapies is side effects. Side effects of anti-stress drugs include drowsiness, respiration problems and paradoxical reactions (opposite outcomes to ones you expect from treatment, e.g. impulsive behaviours, uncontrollable emotional responses). BBs also reduce heart rate and blood pressure too much in some individuals and are not suitable for people with diabetes or severe depression. A person might stop taking the drug because of side effects, so anxiety symptoms return. This means that Parveneh needs to carefully weigh up the side effects against the benefits of the drug, and also against alternatives including psychological therapies (e.g. biofeedback).

Biofeedback trains people to control involuntary physiological processes (e.g. heart rate, muscle tension). In Phase 1 the client is connected to a machine which converts physiological activity into visual and/or auditory signals. In Phase 2 the client applies learned stress management techniques. The client monitors the effect of changes – for example, they can see that changed breathing causes a change on a visual display in the desired direction (e.g. altering the line of the graph). In Phase 3, once the client becomes aware of their physiological response and how to control it (e.g. reducing heart rate), they transfer control to everyday life.

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One limitation of biofeedback is its effectiveness depends on what is measured. Lemaire *et al*. (2011) found that biofeedback had very little effect on objective, physiological indicators of the stress response (e.g. blood pressure) – no more so than placebo. Therefore the effectiveness of biofeedback depends on the outcome measure, what it is you actually aim to 'treat'. So everything depends on what Percy means by 'it worked'. Perhaps he meant that biofeedback helped make him 'feel better'. But the effects on stress-related risk factors for CVD are much less clear.

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1. Men tend to use problem-focused methods. Lazarus and Folkman (1984) suggest problem-focused methods reduce stress by tackling the root causes in a direct, practical and rational way. For example, taking control to remove or escape from stress, learning new skills such as time management or relaxation techniques.

Women tend to use emotion-focused methods. Lazarus and Folkman suggest emotion-focused methods reduce stress indirectly by tackling the anxiety associated with a stressor. For example, various forms of avoidance such as keeping busy and using cognitive appraisal to think about the stressor more positively.

2. Peterson *et al*. (2006) assessed coping strategies of men and women diagnosed as infertile – using several measures, including the Ways of coping questionnaire. Men are more likely to use planful problem-solving – a feature of a problem-focused approach. Women are more likely to accept blame and use various avoidance tactics – characteristics of an emotion-focused approach.

Taylor *et al*. (2000) argue from an evolutionary perspective that fight or flight is disadvantageous for females because confronting or fleeing from a predator makes it hard to protect one's offspring. They argue that a different response has evolved in females – tend and befriend. Tending involves protecting, calming and nurturing offspring, blending in with environment. Befriending involves seeking support from social networks at times of stress in order to cope.

Oxytocin is mainly a female hormone. It promotes feelings of goodwill and affiliation with others, and helps the body recover more quickly from physiological effects of stressors. Taylor *et al*. (2002) found higher levels of oxytocin linked with lower cortisol levels only in female participants. The female sex hormone oestrogen increases the effects of oxytocin, but male hormones (e.g.

testosterone) reduce the effects – so oxytocin effects are stronger in women, creating a reduced stress response.

3. One limitation is that there is no clear distinction between the coping strategies that men and women are thought to use. In many studies, there are usually more gender similarities than differences. Peterson *et al.* (2006) found that men and women often use strategies that are hard to categorise as problem-focused or emotion-focused. For example, seeking social support from others can be classified as either or both. Both genders use social support a lot, sometimes to seek information (problem-focused) and sometimes to help them feel better (emotion-focused). Therefore the distinction between emotion- and problem-focused strategies is unworkable and it is not valid to conclude that women mostly use one and men the other.

Another limitation is that many studies use retrospective recall. Participants have to recall which methods they have used in the past to cope with stress. According to de Ridder (2000), women only appear to use emotion-focused strategies more because they recall doing so more often than men. When a concurrent method of recall is used (in which participants report their strategies at regular intervals during the day), the gender difference disappears. This means the gender difference in use of coping strategies is an illusion that depends on what participants can remember.

4. Men tend to use problem-focused methods. Lazarus and Folkman (1984) suggest problem-focused methods reduce stress by tackling the root causes in a direct, practical and rational way. For example, taking control to remove or escape from stress, learning new skills such as time management or relaxation techniques. Women tend to use emotion-focused methods. Lazarus and Folkman suggest emotion-focused methods reduce stress indirectly by tackling the anxiety associated with a stressor. For example, various forms of avoidance such as keeping busy and using cognitive appraisal to think about the stressor more positively.

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intervals during the day), the gender difference disappears. This means the gender difference in use of coping strategies is an illusion that depends on what participants can remember.

A strength of the 'tend and befriend' concept is evidence to support it. Tamres *et al*. (2002) found women were significantly more likely than men to seek social support – a central part of the befriending response to stress. Women are more likely to create, maintain and use social networks to promote caring for others (mainly offspring), which means that they are likely to receive support from others at times of stress that reduces its negative impact. This suggests that there are gender differences in social support/tend and befriend, with this response being more prevalent in females.

On the other hand, fight or flight may sometimes be a more adaptive response for females than tend and befriend. Protecting offspring is a complex task that benefits from the ability to respond flexibly. It is adaptive for females sometimes to be aggressive to protect offspring. Similarly, men can use tend and befriend as a coping response in situations where it is more adaptive than fight or flight. This suggests that a strict gender distinction in the use of tend and befriend is actually blurred and complex.

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1. Schaefer *et al*. (1981) suggest instrumental support could be: physically doing something (e.g. giving someone a lift to the hospital); providing information (e.g. telling someone what you know about stress).

Emotional support is what we provide when we say 'I really feel for you', or 'I'm sorry you're going through such a tough time' – it expresses warmth, concern, affection, empathy and love.

Esteem support is when we reinforce someone's faith in themselves and their belief in their ability to tackle a stressful situation. Increasing their confidence in themselves reduces feelings of stress.

2. Cohen *et al*.'s (2015) investigation into hugs as a form of social support showed that the participants who experienced the most stress (interpersonal conflicts such as arguments) were most likely to become ill (after being exposed to a common cold virus). Those who perceived they had greater social support had a significantly reduced risk of illness. Hugs accounted for up to one-third of the protective effect of social support. Participants who had the most frequent hugs were less likely to become infected (or symptoms were less severe). This shows that perceived social support is a buffer against stress.

Fawzy *et al*. (1993) studied patients with malignant melanoma (skin cancer) and showed that when they received support from a group for just six weeks (one session a week), six years later they had better NK cell functioning and were more likely to be alive and free of cancer compared with patients in a control group.

3. One strength is research evidence to confirm the beneficial effects of social support. A wealth of research links various forms of social support with well-being, and absence of support with illness. Fawzy *et al*. (1993) studied patients with malignant melanoma (skin cancer) and showed that when they received support from a group for just six weeks (one session a week), six years later they had better NK cell functioning and were more likely to be alive and free of cancer compared with patients in a control group. This shows that beneficial effects of social support can be substantial and long-lasting. The validity of these findings is greater because the study was well-controlled and prospective (social support predicted outcome several years on).

One limitation is social support does not benefit men and women equally. Research shows women and men benefit from social support but in different ways. It depends on the type of social support. Luckow *et al.*'s (1998) review of studies showed that women used emotional support much more than men, but men did use instrumental support more. This suggests that men may only benefit from the support of others in certain circumstances.

4. Schaefer *et al*. (1981) suggest instrumental support could be physically doing something (e.g. giving someone a lift to the hospital), providing information (e.g. telling someone what you know about stress). Emotional support is what we provide when we say 'I really feel for you', or 'I'm sorry you're going through such a tough time' – it expresses warmth, concern, affection, empathy and love. Esteem support is when we reinforce someone's faith in themselves and their belief in their ability to tackle a stressful situation. Increasing their confidence in themselves reduces feelings of stress.

Cohen *et al*. (2015) telephoned healthy adult participants every evening for 14 consecutive days to report how many hugs they'd received that day. They also completed a questionnaire on perceived social support. Researchers placed participants in quarantine, exposed them to a common cold virus and monitored them for illness (stress acts as an immunosuppressant so we expect people who are more stressed to become ill).

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Another limitation is that support can have negative effects. Emotional support from friends, relatives and from sources online is usually welcomed, but instrumental support from these sources can be unreliable. Even emotional support from a friend/relative can be unhelpful, e.g. they go with us to a hospital appointment and we feel more anxious. This suggests that social support is not universally beneficial but depends on many factors.

A final limitation is that social support may be less beneficial than personality characteristics such as hardiness. According to Kobasa (1979), commitment, challenge and control are characteristics of the hardy person which do not depend on support from others. Hardiness is also a more reliable buffer against stress because social support can backfire and have negative effects. Some people may also

find it easier to develop their hardiness than to acquire a circle of friends to offer support. Therefore social support has an important role to play in coping with stress but its value may have been exaggerated.

Chapter 11 Aggression

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1. Papez (1937) and Maclean (1952) linked the limbic system to emotions e.g. aggression. The system includes the hypothalamus, amygdala and parts of the hippocampus. Speed and sensitivity of limbic system responses to stimuli are important predictors of aggressive behaviour in humans. The amygdala in particular plays a key role in how we assess and respond to environmental threats. Scans have shown that aggressive reactions are associated with a fast and heightened response by the amygdala.

Normal levels of serotonin in the orbitofrontal cortex are inhibitory and linked with reduced firing of neurons and associated with greater behavioural self-control. Decreased serotonin disturbs this mechanism, reduces self-control and increases impulsive behaviours, including aggression (Denson *et al*. 2012). Virkkunen *et al*. (1994) compared levels of a serotonin metabolite (5-HIAA) in the cerebrospinal fluid of violent impulsive and non-impulsive offenders. Levels are significantly lower in impulsive offenders – disturbance of this pattern implies disruption of serotonin functioning.

2. Testosterone is a hormone responsible for the development of masculine features. It helps regulate social behaviour via influence on areas of the brain involved in aggression. Dolan *et al* (2001) found a positive correlation between testosterone levels and aggressive behaviours in male offenders in UK maximum security hospitals. Most offenders had personality disorders (e.g. psychopathy) and had histories of impulsively violent behaviour.

Animal studies (Giammanco *et al*. 2005) show that experimental increases in testosterone are related to aggressive behaviour. The converse is also true – testosterone decrease leads to a reduction in aggression in castration studies.

3. One limitation is the neural (limbic system) explanation excludes other possibilities. Limbic structures like the amygdala function in tandem with the non-limbic orbitofrontal cortex (OFC) to maintain self-control and inhibit aggression. Coccaro *et al*. (2007) showed OFC activity is reduced in people with psychiatric disorders that feature aggression. This shows that the neural regulation of aggression is more complex than theories focusing on the amygdala suggest.

However, there is supporting evidence for the role of serotonin. Research shows drugs that increase serotonin activity also reduce levels of aggressive behaviour. Berman *et al*. (2009) found that participants given a serotonin-enhancing drug called *paroxetine* gave fewer and less intense electric shocks to a confederate than people in a placebo group. This was only true of participants who had a prior history of aggressive behaviour, but is evidence of a link between serotonin function and aggression that goes beyond causal findings.

4. Papez (1937) and Maclean (1952) linked the limbic system to emotions e.g. aggression. The system includes the hypothalamus, amygdala and parts of the hippocampus. Speed and sensitivity of limbic system responses to stimuli are important predictors of aggressive behaviour in humans. The amygdala in particular plays a key role in how we assess and respond to environmental threats so disruption to this part of the brain, for example through damage, might account for Petra's aggression. Scans have shown that aggressive reactions (in Petra's case lashing out) are associated with fast and heightened response by the amygdala.

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maintain self-control and inhibit aggression. Coccaro *et al*. (2007) showed OFC activity is reduced in people with psychiatric disorders that feature aggression. This shows that the neural regulation of aggression is more complex than theories focusing on the amygdala suggest and that the regulation of aggression cannot be explained by the limbic system alone and that it is unlikely to be the sole explanation of Petra's behaviour.

However, there is supporting evidence for the role of serotonin. Research shows drugs that increase serotonin activity also reduce levels of aggressive behaviour. Berman *et al*. (2009) found that participants given a serotonin-enhancing drug called *paroxetine* gave fewer and less intense electric shocks to a confederate than people in a placebo group. This was only true of participants who had a prior history of aggressive behaviour, but is evidence of a link between serotonin function and aggression that goes beyond causal findings. It is possible that Petra has a serotonin dysfunction given that she also is depressed and has sleep problems, both of which have been linked with serotonin.

Testosterone is a hormone responsible for the development of masculine features. It helps regulate social behaviour via influence on areas of the brain involved in aggression. Dolan *et al* (2001) found a positive correlation between testosterone levels and aggressive behaviours in male offenders in UK maximum security hospitals. Most offenders had personality disorders (e.g. psychopathy) and had histories of impulsively violent behaviour. Whilst this study was conducted on males only, it would be reasonable to suggest that the hormone might have at least a similar effect on women and may be one explanation for Petra's behaviour.

However, evidence for the role of testosterone in human aggression is mixed as some research shows other hormones have a significant role, too. Carré and Mehta's (2011) dual-hormone hypothesis claims high testosterone leads to aggression but only when cortisol is low – high cortisol blocks its influence on aggressive behaviour. So the combined action of serotonin and cortisol might actually be a better explanation for Petra's aggression than testosterone alone.

Reaching conclusions about Petra's aggressive behaviour is difficult given that much of the research into neural and hormonal mechanisms is based on non-human studies. Aggression in Petra is more complex than it is in rats or even monkeys. Cognitive factors are likely to play an important role in Petra's aggressive behaviour, unlike in the case of animals. Therefore, animal studies can help us understand hormonal and neural influences on aggression but findings must be treated cautiously because human aggression is more complex.

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1. Twin studies show genetic factors account for about 50% of variance in aggressive behaviour. Coccaro *et al*. (1997) studied adult male monozygotic (MZ) and dizygotic (DZ) twins. For direct physical aggression, the researchers found concordance rates of 50% for MZ twins and 19% for DZs. For verbal aggression, the figures were 28% for MZ twins and 7% for DZ twins.

A dysfunction in the operation of the MAOA gene may lead to abnormal activity of the MAOA enzyme, which affects levels of serotonin (low levels of this are linked to aggression). Brunner *et al*. (1993) found that 28 male members of a Dutch family involved in impulsively violent behaviour possessed the low-activity variant of the MAOA gene (MAOA-L).

Frazzetto *et al*. (2007) found an association between antisocial aggression and the MAOA-L gene variant in adult males but only in those who experienced significant trauma (e.g. sexual or physical abuse) during the first 15 years of life. Those who had not experienced trauma were not especially aggressive as adults even if they possessed the MAOA-L gene variant.

2. Monoamine oxidase A (MAOA) is an enzyme which 'mops up' neurotransmitters after a nerve impulse has been transmitted between neurons. It breaks down the neurotransmitter (e.g. serotonin) into constituent chemicals to be recycled or excreted. Production of this enzyme is determined by the MAOA gene and a dysfunction in the operation of this gene may lead to abnormal activity of the MAOA enzyme, which affects levels of serotonin (low levels of this are linked to aggression). Specifically, aggression has been linked to inheritance of the low-activity variant of the MAOA gene (MAOA-L) by Lea and Chambers (2007).

Brunner *et al*. (1993) found that 28 male members of a Dutch family involved in impulsively violent behaviour possessed the MAOA-L gene variant. Frazzetto *et al*. (2007) found an association between antisocial aggression and the MAOA-L gene variant in adult males but only in those who experienced significant trauma (e.g. sexual or physical abuse) during the first 15 years of life. Those who had not experienced trauma were not especially aggressive as adults even if they possessed the MAOA-L gene variant.

3. One problem with interpreting genetic research is that it is difficult to separate genetic and environmental factors. For example, Frazzetto *et al*. (2007) found an association between antisocial aggression and the MAOA-L gene variant in adult males but only in those who experienced significant trauma (e.g. sexual or physical abuse) during the first 15 years of life. Those who had not experienced trauma were not especially aggressive as adults even if they possessed the MAOA-L gene variant. This may explain why it has proven surprisingly difficult to identify the precise genetic mechanisms involved in aggression.

Another limitation is that the mechanism of the MAOA-serotonin-aggression link is unclear. Research has linked aggression with low levels of serotonin. But the MAOA-L gene variant causes low activity of the MAO-A enzyme which in turn should lead to higher serotonin. This is because the low-activity variant does not deactivate serotonin, leaving more serotonin in the synapse for transmission. So it is more accurate to say that serotonin levels are disrupted in people with the MAOA-L variant. This shows that the link between the MAOA gene, serotonin and aggression is not yet fully understood.

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Adoption studies show genetic factors account for about 41% of variance in aggressive behaviour. Similarities in aggressive behaviour between adopted child and biological parents suggest genetic influences are operating; but similarities with adoptive parents suggest environmental factors. This reminds us that the genetic role in Estelle's aggression is only part of the story and her environment will also have played its part.

The mechanism through which Estelle might have inherited this characteristic is abnormal activity of the MAOA enzyme, which affects levels of serotonin (low levels of this are linked to aggression). Brunner *et al*. (1993) found that 28 male members of a Dutch family involved in impulsively violent behaviour possessed the low-activity variant of the MAOA gene. Estelle's father may have passed on this low activity MAOA gene.

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aggression and the MAOA-L gene variant in adult males but only in those who experienced significant trauma (e.g. sexual or physical abuse) during the first 15 years of life. Those who had not experienced trauma were not especially aggressive as adults even if they possessed the MAOA-L gene variant. There is no evidence that this was the cause of Estelle's father's violence, but it may explain why it has proven surprisingly difficult to identify the precise genetic mechanisms involved in aggression.

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Finally, another limitation of genetic research is problems with the validity of twin studies. In every pair of twins, both individuals share the same environment (because each pair is raised together). But DZ twins may not share their environment to the same extent that MZ twins share theirs. Yet twin research assumes they do – this is the equal environments assumption. The assumption may be wrong because one aspect of the environment is the way twins are treated by others. MZ twins are treated very similarly, especially by parents (e.g. praising them equally for being aggressive). DZs are treated in less similar ways. This means that concordance rates are inflated and genetic influences on aggression may not be as great as twin studies suggest.

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1. One difference is where each comes in the chain of environmental influence on behaviour.

An innate releasing mechanism (IRM) is a built-in physiological process or structure (e.g. a network of neurons in the brain). It acts as a 'filter' to identify threatening stimuli in the environment and is activated by an environmental stimulus.

An IRM triggers a fixed action pattern (FAP). A FAP is a relatively unchanging behavioural sequence (ritualistic) found in every individual of a species (universal) and follows an inevitable course which cannot be altered before it is completed (ballistic).

2. An innate releasing mechanism (IRM) is a built-in physiological process or structure (e.g. a network of neurons in the brain). It acts as a 'filter' to identify threatening stimuli in the environment and is activated by an environmental stimulus. For instance, a network of neurons in a region of the brain may fire in response to seeing an aggressive facial expression. This aggressive environmental stimulus triggers the IRM which in turn 'releases' a highly specific sequence of behaviours called a fixed action pattern (FAP).

A FAP has six main features. It is:
Stereotyped (relatively unchanging) – for instance a male robin's aggressive actions against another robin are always the same.
Universal – all male robins perform the same sequence of aggressive behaviours.
Innate – the robin's aggressive behaviours are not learnt and are the same for every individual regardless of experience.
Ballistic – once the aggressive FAP has begun it cannot be stopped and plays out to completion.
Single-purpose – robins display behaviours in this aggressive situation that they do not show in any other situation.
A response to a specific stimulus – the male robin is aggressive on sight of another red breast.

3. One strength of this explanation is support from research by Brunner *et al*. (1993) which shows the low-activity variant of the MAOA gene is closely associated with aggressive behaviour in humans, suggesting an innate biological basis. There is also evidence for IRMs for aggression in the brain – activity in the limbic system (especially the amygdala) triggers aggressive behaviour in humans and other animals. As the ethological explanation argues that aggression is genetically determined, its validity is supported by evidence that demonstrates the genetic and physiological basis of aggression.

However, cultural differences present huge problems for the explanation. Nisbett (1993) found that when white males from the southern United States were insulted in a research situation, they were more likely than northern white males to become aggressive. This was only true for reactive aggression triggered by arguments, so Nisbett concluded the difference was caused by a culture of honour – impulsive aggression was a learned social norm. It is difficult for ethological theory, with its view of aggression as instinctive, to explain how culture can override innate influences.

4. The ethological explanation of aggression suggests that it is adaptive in that it reduces competition and establishes dominance. For example, if a defeated animal is not killed but forced into territory elsewhere this reduces competition pressure and also reduces the possibility of starvation because it may find new resources. Aggression also helps establish dominance hierarchies (e.g. a male chimpanzee's dominance gives him special status including mating rights over females).

Much aggression is suggested to be ritualistic, for example Lorenz (1966) observed most intra-species aggression consisted mainly of ritualistic signalling (e.g. displaying teeth) and rarely became physical. Intra-species aggression usually ends with an appeasement display – this indicates acceptance of defeat and inhibits aggression in the winner, preventing injury to the loser. This is adaptive because every aggressive encounter ending with death of an individual could threaten the existence of species.

An innate releasing mechanism (IRM) is a built-in physiological process or structure (e.g. a network of neurons in the brain). It acts as a 'filter' to identify threatening stimuli in the environment and is activated by an environmental stimulus, whereas an FAP is what is triggered by that IRM. The FAP is a relatively unchanging behavioural sequence (ritualistic) found in every individual of a species (universal) and follows an inevitable course which cannot be altered before it is completed (ballistic).

One strength of this explanation is support from research by Brunner *et al*. (1993) which shows the low-activity variant of the MAOA gene is closely associated with aggressive behaviour in humans, suggesting an innate biological basis. There is also evidence for IRMs for aggression in the brain – activity in the limbic system (especially the amygdala) triggers aggressive behaviour in humans and other animals. As the ethological explanation argues that aggression is genetically determined, its validity is supported by evidence that demonstrates the genetic and physiological basis of aggression.

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Furthermore, Goodall (2010) observed male chimps from one community systematically slaughter the members of another group in a co-ordinated and premeditated fashion. This happened despite the victims offering signals of appeasement and defencelessness – these did not inhibit the aggression of the attacking chimps as predicted by the ethological explanation. Goodall's observations challenge the view

of the ethological explanation that aggression has evolved into a self-limiting and relatively physically harmless ritual.

There is also the question as to whether FAPs are actually fixed. Hunt (1973) points out that sequences of behaviours that appear to be fixed and unchanging are actually much more influenced by environmental factors and learning experiences than Lorenz thought. He believed that aggression is inevitable and this is demonstrated by the unchanging and unalterable nature of FAPs. However this is now considered an outdated view. This means that FAPs are more flexible than implied and many ethologists now prefer the term 'modal action pattern' to reflect this. Therefore patterns of aggressive behaviour are much more flexible than Lorenz thought, especially in humans.

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1. The evolutionary explanation suggests that men in our evolutionary past who could avoid cuckoldry (having to raise offspring that are not their own) were more reproductively successful, so psychological mechanisms have evolved to increase anti-cuckoldry behaviours in men (e.g. sexual jealousy felt more strongly by men than women). It is, according to evolutionary theory, these mechanisms that drive the often aggressive mate retention strategies men use to keep their partners and prevent them from 'straying' – these were adaptive in our evolutionary history.

2. Sexual jealousy is a key motivator of aggression in males because men – unlike women – can never be sure that they are really their child's parent. Men in our evolutionary past who could avoid cuckoldry (having to raise offspring that are not their own) were more reproductively successful, so psychological mechanisms have evolved to increase anti-cuckoldry behaviours in men (e.g. sexual jealousy felt more strongly by men than women). It is, according to evolutionary theory, these mechanisms that drive the often aggressive mate retention strategies men use to keep their partners and prevent them from 'straying' – these were adaptive in our evolutionary history.

Wilson and Daly (1996) identified aggressive mate retention strategies which have evolved in males. One is direct guarding which involves males monitoring their partner's behaviour (e.g. checking their movements). Another is negative inducements, which are threats to harm either the partner ('I'll kill you if you have an affair') or the self ('I'll kill myself if you leave me'). Wilson *et al*. (1995) found that such strategies are closely linked to aggression. Men who employed them were twice as likely to inflict physical violence on their partners as men who did not use them.

3. On the one hand many research studies demonstrate mate retention strategies are associated with sexual jealousy and aggression. For example, Wilson *et al*. (1995) found that men who employed them were twice as likely to inflict physical violence on their partners as men who did not use them. This suggests that aggression may have evolved as an adaptive behaviour for males to achieve goals related to reproduction.

However, a limitation is that there are wide cultural differences in aggressive behaviour. Aggression is not universal because there are some cultures where it appears to be almost non-existent. For example, the !Kung San people have very negative attitudes towards the use of aggression which is discouraged from childhood in both boys and girls and is therefore rare. Therefore, since some cultures do not show aggressiveness, such behaviour may not necessarily be adaptive.

4. The evolutionary explanation suggests that men are more sexually jealous than women and that is because of the threat of cuckoldry (having to raise offspring that are not their own). This can be considered to be a 'waste of his resources' because it contributes to survival of a rival's genes and leaves the 'father' with fewer resources to invest in his own future offspring. As such aggressive mate retention

strategies (the abuse in this example) were a method that men used in our evolutionary past to keep their partners faithful. As such that aggressive behaviour was adaptive and also would be universal (behaviour seen 'in lots of different parts of the world').

Wilson and Daly (1996) identify two major mate retention strategies involving aggression: direct guarding – a man's vigilance over a partner's behaviour (e.g. checking who they've been seeing); and negative inducements (e.g. threats of consequences for infidelity – 'I'll kill myself if you leave me.').

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However there is controversy over exactly how harmless the !Kung really are. Lee (1979) describes the homicide rate as high for such a peaceable people. Contradictory findings may be due to differences in how 'outsider' researchers perceive behaviour in other cultures, which are biased by expectations.

Researchers have traditionally viewed bullying as a maladaptive behaviour (e.g. due to poor social skills or childhood abuse) but evolutionary ancestors may have used it as an adaptive strategy to increase chances of survival by promoting their own health and creating reproduction opportunities. In men, bullying suggests dominance (attracting a mate in the example) acquisition of resources, strength and also wards off potential rivals (keeping a partner in the example) according to Volk *et al*. (2012). However, women could be prone to bullying for evolutionary reasons, too. Women use bullying behaviour to secure a partner's fidelity, which means he continues to provide resources for future offspring.

One strength of evolutionary explanations is that they can point us towards ways to reduce bullying. Several interventions are based on the assumption that addressing a bully's deficiencies will reduce their bullying. Yet bullying is still prevalent. Ellis *et al*. (2016) suggest instead a different strategy based on the evolutionary view that bullying is adaptive for the bully because they benefit from it. The 'meaningful roles' intervention aims to increase the costs of bullying and the rewards of prosocial (non-bullying) alternatives. For example, bullies might be given roles in school that provide them with a different source of status. Therefore viewing bullying as adaptive may present opportunities for reducing bullying in real-world situations where nothing else has worked.

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1. Dollard *et al*.'s (1939) hypothesis suggests that frustration always leads to aggression, and aggression is always the result of frustration. This is based on the psychodynamic approach – aggression is a psychological drive similar to biological drives (e.g. hunger) and we experience frustration if our attempt to achieve a goal is blocked by an external factor. The aggressive drive leads to aggressive thoughts/behaviour (violent fantasy, verbal outburst, physical violence). Expression of the aggressive drive in behaviour is cathartic because the aggression created by the frustration is satisfied which in turn

reduces the drive, making further aggression less likely – we feel better for getting it 'off our chest'. Aggression may be expressed indirectly, displaced onto an alternative target that is weaker and is available (an object, a pet, younger sibling, etc.).

2. Geen (1968) arranged for participants to be insulted as they completed a task. These participants gave the strongest (fake) electric shocks when they had the opportunity, because they had experienced the highest level of frustration. A non-frustrated control group gave the lowest level of shock.

Berkowitz and LePage (1967) created frustration in their participants, who gave the highest level of (fake) shock to a confederate when there were two guns on a nearby table – this is the weapon effect.

Marcus-Newhall *et al*.'s (2000) meta-analysis showed that frustrated participants who were prevented from being aggressive towards the source of frustration were likely to aggress against an innocent target instead – displaced aggression is a reliable phenomenon.

3. Marcus-Newhall *et al*. (2000) conducted a meta-analysis of 49 studies of displaced aggression to test the frustration-aggression hypothesis. Participants who were provoked but unable to retaliate directly against the source of their frustration were significantly more likely to aggress against an innocent party than people who were not frustrated. This supports a central claim of the hypothesis that frustration always leads to aggression and is reliably displaced against another target if the true source of frustration is unavailable.

However, Bushman (2002) found that participants who vented their anger by hitting a punch bag became angrier and more aggressive rather than less. Using venting to reduce anger is like using petrol to put out a fire. Bushman argues it does not work even for people who believe in its value. In fact, the better people feel after venting, the more aggressive they are according to Bushman. This casts doubt on the validity of a central assumption of the hypothesis.

4. Dollard *et al*.'s (1939) hypothesis suggests that frustration always leads to aggression, and aggression is always the result of frustration. This is based on the psychodynamic approach – aggression is a psychological drive similar to biological drives (e.g. hunger) and we experience frustration if our attempt to achieve a goal is blocked by an external factor. In the case of the students they were likely to have been aiming for higher grades because they were working very hard. The theory suggests that the aggressive drive leads to aggressive behaviour but this was only the case for Camilla (she head-butted a wall). As such Ricardo's response (going quiet and having another go) is not easily explained by the theory that says frustration always leads to aggression. According to the theory, Camilla should feel better afterwards as expression of the aggressive drive in behaviour is cathartic. The aggression created by the frustration is satisfied, which in turn reduces the drive, making further aggression less likely – she should feel better for getting it 'off her chest'.

In this case the aggression is indirect (it wasn't the wall's fault!) because the cause of frustration is abstract (the examining board for creating such tricky questions) or too powerful for them to vent their anger at directly (e.g. the teacher that assigned the mark or who gave you a low grade) or unavailable (e.g. the teacher left before you saw the grade).

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Another limitation is that the link between frustration and aggression is more complex than the F-A hypothesis suggested. Both research and everyday experience show that frustration does not always lead to aggression, and that aggression can occur without frustration. Someone who feels frustrated may behave in a variety of ways. Camilla behaved aggressively, but Ricardo's response was quite different. Helplessness and determination are also potential responses to frustration. This means the F-A hypothesis lacks validity because it fails to explain how aggression arises only in some situations but not in others.

However, recognising this, Berkowitz (1989) reformulated the hypothesis in his negative affect theory, arguing that frustration is just one of many aversive stimuli that create negative feelings. Aggression is triggered by negative feelings generally rather than by frustration specifically. The outcome of frustration can be a range of responses only one of which is aggression. This is a strength because it highlights the flexibility of the hypothesis.

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1. Social learning theory suggests that not only is aggression learned directly through positive and negative reinforcement (operant conditioning), but also indirectly through observation. It is proposed that in fact the latter explains most aggressive behaviour. For example, a child will learn through parental and other models how aggressive behaviour is performed. They also learn the consequences of aggression in the same indirect way (vicarious reinforcement). Social learning requires attention, retention, reproduction and motivation.

The frustration-aggression hypothesis suggests that frustration always leads to aggression, and aggression is always the result of frustration. Aggression is a psychological drive similar to biological drives and we experience frustration if our attempt to achieve a goal is blocked by an external factor. The aggressive drive leads to aggressive behaviour. Expression of the aggressive drive in behaviour can be direct or indirect but is said to be cathartic because the aggression created by the frustration is satisfied, which in turn reduces the drive making further aggression less likely.

2. Social learning theory tells us that aggression is learned directly through positive and negative reinforcement (operant conditioning), but also indirectly through observation. Indirect or vicarious learning in fact explains most aggressive behaviour. For example, a child will learn through parental and other models how aggressive behaviour is performed. They also learn the consequences of aggression in the same indirect way (vicarious reinforcement). SLT also considers the cognitive requirements for aggression and suggests first that attention to a model's aggressive action is necessary. The observer must then retain or remember that behaviour, reproduce it and finally be motivated to repeat it. Our self-efficacy in relation to aggression increases every time the behaviour produces rewards.

3. One strength of SLT is support from research studies such as Poulin and Boivin (2000). They found most aggressive boys (aged 9 to 12 years old) formed friendships with other aggressive boys. Therefore they were exposed frequently to models of physical aggression (each other) and to its reinforcing consequences (including rewarding approval). For example, the boys observed each other being

rewarded for using proactive aggression (bullying peers to get what they wanted). This supports the conditions necessary for imitation predicted by SLT as an explanation for aggression.

However, this study did not find similar outcomes for all types of aggression. It was only proactive aggression ('cold-blooded') that was learnt through social learning processes. The boys were much less likely to imitate each other's reactive aggression (i.e. 'hot-blooded' outbursts). This may be because the consequences of reactive aggression are less reinforcing because they are unpredictable – a boy who uses angry and impulsive aggression may find himself on the receiving end of the same. Therefore SLT is limited because it is a relatively weak explanation of reactive aggression.

4. Social learning theory suggests that not only is aggression learned directly through positive and negative reinforcement (operant conditioning), but also indirectly through observation. If Tabitha is exposed regularly to aggressive behaviour amongst her friends, then she will learn vicariously. She will also be learning the consequences of aggression in the same indirect way (vicarious reinforcement) so if they are experiencing positive consequences she will be learning that aggression is rewarding.

In terms of the cognitive element of the theory, Tabitha is certainly paying attention to the models (the girls she is hanging around with) and she finds them 'interesting and exciting'. This suggests that not only has she remembered their behaviour, but since she is also excited by it she is showing clear signs of motivation to repeat it and become aggressive herself – she will therefore just need the ability to reproduce the aggressive behavioiur in order to meet all the conditions. Finally, SLT suggests that repeated exposure to aggression means that efficacy increases every time that the behaviour produces rewards hence Tabitha's growing confidence.

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A strength of SLT is that it acknowledges that Tabitha is not a passive recipient of reinforcement – she is shaping her own aggressive behaviour by choosing situations which reward aggression, in other words by remaining with her current friendship group. A way to reduce aggression is to break this cycle by encouraging aggressive children to form friendships with children who do not habitually behave aggressively. The same social learning processes that would otherwise lead Tabitha into aggressive behaviour can be harnessed in a more constructive direction as she imitates the behaviour of rewarded non-aggressive models. Therefore SLT provides a practical benefit of understanding Tabitha's aggression and encouraging her to break the cycle she is in by spending more time with other friends.

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1. The de-individuation explanation suggests that aggression occurs as a result of environmental factors, such as crowds or darkness, which reduce the constraints we place on our aggression, whereas SLT suggests we learn the behaviour from our own direct reinforcement and the vicarious reinforcement of models around us. In de-individuation, the process involves believing that personal responsibility for any aggression is shared, for example in a crowd, whereas SLT suggests a more complex cognitive process of attention, retention, reproduction and motivation.

2. De-individuation occurs when we become part of a crowd, lose restraint and behave in ways we otherwise would not. We might become aggressive because we lose our sense of self-identity, disregard social norms and no longer feel responsible for our behaviour. The responsibility is shared throughout the crowd, so we feel less guilt about being aggressive because we are not personally responsible.

Zimbardo (1969) argued that de-individuated behaviours are emotional, impulsive and anti-normative. In this state we 'live for the moment', fail to plan and stop monitoring our behaviour. Aggression is promoted by conditions of de-individuation such as darkness and masks because they provide anonymity.

As a de-individuated part of a faceless crowd, we are more likely to become aggressive because our private self-awareness is reduced. Our attention becomes focused on events around us and we think less about our own feelings, becoming less self-critical. Our public self-awareness is also reduced. We believe we can behave aggressively because we are less likely to be judged by others so we do not care how others see us.

3. There is certainly research support for the de-individuation theory. For example, Douglas and McGarty (2001) looked at aggressive online behaviour in chatrooms and uses of instant messaging. They found a strong correlation between anonymity and 'flaming' (posting hostile messages). The most aggressive messages were sent by those who hid their identities. This supports a link between anonymity, de-individuation and aggressive behaviour in a context that has even greater relevance today with the possibilities of social media.

Another strength is that de-individuation can explain the surprisingly aggressive behaviour of 'baiting crowds'. Mann (1981) investigated cases of 'suicidal jumpers' (e.g. people jumping from buildings and bridges). He found 21 examples in US newspapers of crowds gathering to encourage ('bait') people to jump, often in very aggressive ways. This was more likely to happen when the conditions matched those predicted by de-individuation theory, e.g. when it was dark, the crowds were large and the jumpers were distant. This suggest there is validity to the idea that people can become aggressive as part of a de-individuated faceless crowd.

However, some research shows that the conditions for de-individuation do not necessarily lead to aggression. In his 'deviance in the dark' study, Gergen *et al*. (1973) put strangers in a darkened room and told them to do what they wanted as they could not be identified and would never meet again. They soon started kissing and touching each other. Despite a guarantee of anonymity creating the conditions for de-individuation, aggressive behaviour was not an outcome of this study and de-individuation cannot explain why this was not the case.

4. Social learning theory tells us that aggression is learned directly through positive and negative reinforcement (operant conditioning), but also indirectly through observation. Indirect or vicarious learning in fact explains most aggressive behaviour. For example, a child will learn through parental and other models how aggressive behaviour is performed. They also learn the consequences of aggression in

the same indirect way (vicarious reinforcement). Social learning requires attention, retention, reproduction and motivation.

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The de-individuation theory argues that aggressive behaviour is usually constrained by social norms but when we experience de-individuated conditions we lose individual self-identity and responsibility for our behaviour. For example, when we are in a crowd, responsibility is shared throughout the crowd – we ignore social norms and experience less personal guilt at harmful aggression directed at others. Anonymity (in crowds or in the dark) reduces private self-awareness because our attention is focused outwardly to the events around us. This means we think less about our own beliefs and feelings – we are less self-critical and evaluative. Anonymity also reduces public self-awareness because we realise we are anonymous and our behaviour is less likely to be judged by others.

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1. Dispositional explanations suggest that inmates bring with them into prisons a subculture typical of criminality – including beliefs, values, norms, attitudes, learning experiences and personal characteristics (e.g. gender and ethnicity). Inmates import these to negotiate their way through the unfamiliar prison environment in which existing inmates use aggression to establish power, status and access to resources.

Situational explanations focus on harsh prison conditions and the way that they cause stress for inmates who cope by behaving aggressively. For example, deprivations such as an unpredictable prison regime that regularly uses 'lock-ups' to control behaviour.

2. Dispositional explanations suggest that inmates bring with them into prisons a subculture typical of criminality – including beliefs, values, norms, attitudes, learning experiences and personal characteristics (e.g. gender and ethnicity). Inmates import these to negotiate their way through the unfamiliar prison environment in which existing inmates use aggression to establish power, status and access to resources.

DeLisi *et al*. (2011) studied juvenile delinquents in California institutions who imported several negative dispositional features. This included violent behaviour specifically but also childhood trauma, anger and histories of substance abuse which could explain the high levels of aggression in the institutions. The inmates in the DeLisi *et al*. study were more likely to engage in suicidal activity and sexual misconduct, and committed more acts of physical violence compared with a control group of inmates with fewer negative dispositional features.

3. There is certainly support for individual-level factors as predictors of aggression but research shows that some situational variables are also highly influential. Cunningham *et al*. (2010) analysed inmate homicides in Texas prisons and found motivations for the behaviours were linked to some of the deprivations suggested by Clemmer's model. For example, many homicides followed arguments between inmates when 'boundaries' were judged to have been crossed often involving drugs and possessions. As these are factors predicted by the deprivation model to make aggression more likely, these findings support the validity of a situational explanation.

On the other hand, the deprivation model predicts a lack of freedom such as heterosexual contact would lead to high levels of aggression in prisons but the available evidence does not support this. Hensley *et al.*'s (2002) study found that allowing conjugal visits was not associated with reduced aggressive behaviour in the institution. This shows situational factors do not necessarily affect prison violence and casts some doubt on the validity of the deprivation model.

4. Dispositional explanations suggest that inmates bring with them into prisons a subculture typical of criminality – including beliefs, values, norms, attitudes, learning experiences and personal characteristics (e.g. gender and ethnicity). Inmates import these to negotiate their way through the unfamiliar prison environment in which existing inmates use aggression to establish power, status and access to resources. This is the point of view expressed by the student who suggests the aggression is because of 'the people in them'. They are suggesting that the 'type' of person placed in prison is likely to have greater tendencies towards aggression than non-inmates.

Camp and Gaes (2005) placed half of their male inmate participants in low-security Californian prisons and the other half in high-security prisons and found that there was no significant difference in aggressive misconduct between the two groups. This supports the idea that features of the prison environment are less important predictors of aggressive behaviour than characteristics of inmates and as such supports the dispositional view of the first student.

However, it is argued that the dispositional explanation is inadequate because it ignores roles of prison officials and factors linked to running prisons. Dilulio (1991) proposed an administrative control model (ACM) which states that poorly managed prisons are more likely to experience the most serious forms of inmate violence (e.g. homicides, rioting), suggesting that these factors are more important than the inmate characteristics focused on by dispositional explanations.

Situational explanations focus on harsh prison conditions and the way that the deprivations involved with lack of choices and freedom causes stress for inmates who cope by behaving aggressively. This is the view expressed by the second student who is saying that the aggression is best explained by 'the way prisons are run'. One example of this would be unpredictable prison regimes that regularly uses 'lock-ups' to control behaviour. This could disrupt the few benefits and positives that prisoners have (for example education or television time), causing stress.

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The most realistic view may be an interactionist one though – that institutional aggression is due to a combination of the individual characteristics imported into the prison by inmates. It is also more realistic because it better reflects the complex nature of institutional aggression, which is unlikely to have just one cause (or set of causes) as assumed by the importation and deprivation models.

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1. Computer games may lead to aggressive behaviour for two main reasons. Firstly, the player takes a more active role compared to a relatively passive television viewer. Secondly, game-playing is more directly rewarding for a player, so direct learning through operant conditioning is a key process. Bartholow and Anderson's (2002) participants played a violent or non-violent computer game for ten minutes – then carried out the Taylor competitive reaction time task, a standard lab measure of aggression (choosing volumes of noise blasts). Those who played the violent game selected significantly higher noise levels compared with non-violent players, highlighting the potential influence of computer games on aggression.

2. Bartholow and Anderson's (2002) participants who played a violent computer game for ten minutes selected significantly higher noise levels on the Taylor competitive reaction time task compared with players of a non-violent game. This is an indicator of high aggression because the task involves punishing a (non-existent) opponent with blasts of white noise.

DeLisi *et al*. (2013) found that aggressive behaviour was positively correlated with how much time juvenile offenders spent playing violent computer games. According to these researchers, this shows that the link is so well-established that aggression should be considered a public health issue and computer

game violence a significant risk factor.

The research also shows that the effects of violent computer games depends on how aggression is defined. Studies often define it in terms of physical violence (e.g. blasting white noise) but, although all violence is aggression, not all aggression is violence.

3. There are numerous methodological issues involved with researching media influences. For example, The Taylor competitive reaction time task measures aggression as the volume of noise selected by participants as punishment which is an unrealistic measure. Many studies are correlational and so we cannot conclude that media influences cause aggression. As such this casts doubt on the validity of the link between the two.

On the other hand, the link has been researched by the full range of methodologies. Individual studies may be limited but the strengths of one often compensate for the limitations of another (e.g. internal and external validity). For example, correlational studies tend to measure media exposure in real-world situations such as people's homes (external validity), whereas lab experiments do not. Therefore, taken together, a range of different methodologies come to similar conclusions suggesting exposure to violent media may have a causal influence on aggressiveness.

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There is also support from correlational studies. DeLisi *et al*. (2013) found that aggressive behaviour was positively correlated with how much time juvenile offenders spent playing violent computer games. According to these researchers, this shows that the link is so well-established that aggression should be considered a public health issue and computer game violence a significant risk factor.

However, we cannot make causal explanations from such evidence. A positive correlation between violent computer games and aggression could arise for more than one reason: violent games may cause people to be aggressive or else people who are already aggressive choose to play violent games. Direction of causality cannot be settled by such studies so we cannot presume that the video games are the cause of the aggression.

Another strength is that the findings of research, especially laboratory studies, can be explained by social learning theory. SLT is described by Anderson *et al*. (2017) as a convincing theoretical framework to

explain media effects on aggression (as shown by Bandura's Bobo doll studies). As it is widely accepted that exposure to violence at home is harmful to children, then logically it makes sense that computer games are other sources of social learning. Children are more likely to imitate aggressive behaviours when they see them being rewarded in computer games (vicarious reinforcement), especially if they identify with on-screen characters. This enhances the validity of research because having a unifying explanation to account for findings is a key feature of science.

However, this is a research area that is plagued by unsupported conclusions. It is important we maintain a sense of balance about this issue. Many research studies are methodologically weak (e.g. confounding variables, poor sampling methods). As pointed out above, many studies are correlational so it is not clear that game-playing is causal in aggression. Finally, lab studies lack external validity because real-world game-playing occurs in very different conditions. Therefore some researchers are guilty of drawing premature conclusions about game-playing and aggression based on findings that lack validity.

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1. Desensitisation refers to how repeated exposure to violent media reduces normal levels of physiological and psychological arousal associated with anxiety, making aggressive behaviour more likely. The desensitisation can be psychological as well as physiological, so repeated exposure also promotes a belief that using aggression as a method of resolving conflict is socially acceptable.

Disinhibition refers to how normal social constraints against aggression can be weakened by repeated exposure via the media so people become 'freer' about using aggression. If exposure to aggressive behaviours makes that behaviour appear normative and socially sanctioned, these behaviours then appear temporarily socially acceptable and therefore more likely.

2. The cognitive priming explanation suggests that repeated experience of aggressive media can provide us with a 'script' about how violent situations may 'play out'. Huesmann (1998) argues that this script is stored in memory so we become 'ready' (primed) to be aggressive. This is an automatic process because a script can direct our behaviour without us being aware of it and the script is triggered when we encounter cues in a situation that we perceive as aggressive.

Concern has been raised about the possible impact of aggressively derogatory lyrics about women in setting up aggressive scripts through cognitive priming. In a study by Fischer and Greitemeyer (2006), male participants heard songs featuring aggressively derogatory lyrics about women. Compared with when they listened to neutral lyrics, participants later recalled more negative qualities about women and behaved more aggressively towards a female confederate. Similar results were found with female participants and 'men-hating' lyrics.

3. A strength of the disinhibition explanation is research support. Berkowitz and Alioto (1973) showed a film depicting aggression as vengeance. Participants gave more (fake) electric shocks of longer duration to a confederate suggesting that media violence may disinhibit aggressiveness when it is presented as justified. This finding demonstrates the link between removal of social constraints and subsequent aggressive behaviour.

Another strength is that disinhibition can explain the influence of cartoon violence. When children watch aggression in cartoons they do not learn specific behaviours from cartoon models as many of them are not physically possible. Children learn social norms instead. The aggression carried out by cartoon models is socially normative, especially when it goes unpunished. This supports the disinhibition hypothesis because children learn from cartoons that aggression is rewarding and achieves goals in a socially acceptable way.

4. In desensitisation, repeated exposure to violent media reduces normal levels of physiological and psychological arousal associated with anxiety, making aggressive behaviour more likely. The desensitisation can be psychological as well as physiological, so repeated exposure also promotes a belief that using aggression as a method of resolving conflict is socially acceptable. This may weaken negative attitudes towards violence, reduce empathy felt for victims and encourage minimisation of injuries sustained by them.

A strength of this explanation is supporting research evidence. Krahé *et al*. (2011) showed participants violent (and non-violent) film clips while measuring physiological arousal using skin conductance. Habitual viewers of violent media showed lower arousal when watching violent film clips, and level of arousal was negatively correlated with unprovoked aggression in a 'noise blast' task. This suggests that lower arousal levels in violent media users reflect desensitisation to the effects of violence leading to a greater willingness to be aggressive.

However, Krahé *et al*. (2011) failed to find a link between media viewing, lower arousal and provoked (reactive) aggression. This may be because catharsis occurred – viewing violent media acts as a safety valve, allowing participants to release aggressive impulses without behaving violently. This suggests that catharsis (i.e. the frustration-aggression hypothesis) might be a better explanation of what happened than desensitisation.

In disinhibition, normal social constraints against certain aggression can be weakened by repeated exposure via the media, and people become 'freer' about using aggression. If exposure to aggressive behaviours makes that behaviour appear normative and socially sanctioned, these behaviours then appear temporarily socially acceptable and therefore more likely.

A strength of the disinhibition explanation is research support. Berkowitz and Alioto (1973) showed a film depicting aggression as vengeance. Participants gave more (fake) electric shocks of longer duration to a confederate suggesting that media violence may disinhibit aggressiveness when it is presented as justified. This finding demonstrates the link between removal of social constraints and subsequent aggressive behaviour.

Another strength is that disinhibition can explain the influence of cartoon violence. When children watch aggression in cartoons they do not learn specific behaviours from cartoon models as many of them are not physically possible. Children learn social norms instead. The aggression carried out by cartoon models is socially normative, especially when it goes unpunished. This supports the disinhibition hypothesis because children learn from cartoons that aggression is rewarding and achieves goals in a socially acceptable way.

The cognitive priming explanation suggests that repeated experience of aggressive media can provide us with a 'script' about how violent situations may 'play out'. Huesmann (1998) argues that this script is stored in memory so we become 'ready' (primed) to be aggressive. This is an automatic process because a script can direct our behaviour without us being aware of it and the script is triggered when we encounter cues in a situation that we perceive as aggressive.

A strength is that understanding how cognitive priming influences aggression has useful practical application and can potentially save lives. Whether situations break into violence depends on how individuals interpret cues which depends on scripts stored in memory. Bushman and Anderson (2002) claim someone who habitually watches violent media accesses stored aggressive scripts more readily. This raises the possibility that effective interventions could reduce aggressive behaviour by challenging hostile cognitive scripts and encouraging habitual violent media users to consider alternatives.

Chapter 12 Forensic psychology

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1. Organised offenders are characterised by evidence of planning the crime – the victim is deliberately targeted and the killer/rapist may have a 'type' of victim. They also show a high degree of control during the crime and little evidence is left behind at the scene.

Disorganised offenders are characterised by little evidence of planning, suggesting the offence may have been spontaneous. The crime scene reflects the impulsive nature of the act – the victim's body is still at the scene and the crime shows little control on the part of the offender.

2. The top-down approach involves matching the crime/offender to pre-existing templates. The pre-existing template was developed by the FBI by interviewing 36 sexually-motivated murderers and using this data, together with characteristics of their crimes, to create two categories (organised and disorganised). If the data from a crime scene matched some of the characteristics of one category we could then predict other characteristics that would be likely. Murderers or rapists are classified in one of two categories (organised and disorganised) based on this evidence. This then informs the investigation.

The organised and disorganised distinction is based on the idea that serious offenders have certain signature 'ways of working'. These generally correlate with a particular set of social and psychological characteristics that relate to the individual.

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3. One limitation is evidence for top-down profiling was flawed. Canter *et al.* (2004) argues that the FBI agents did not select a random or even large sample, nor did it include different kinds of offender. There was no standard set of questions so each interview was different and therefore not really comparable. This suggests that top-down profiling does not have a sound, scientific basis.

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The murder scene that Octavia is investigating appears to be an example of an organised offender. This is because there is very little physical evidence, which means the offender has tried to 'cover their tracks' suggesting it was a planned and not a spontaneous act. The fact that there was evidence that the murder was 'organised and controlling' is further evidence of an organised killer. Octavia can now infer lots of other things about the murderer such as they are likely to be intelligent, charismatic, have a skilled job and family. This helps narrow down the list of suspects.

One strength is research support for an organised category. Canter *et al*. (2004) looked at 100 US serial killings. Smallest space analysis was used to assess the co-occurrence of 39 aspects of the serial killings. This analysis revealed a subset of behaviours of many serial killings which match the FBI's typology for organised offenders. This suggests that a key component of the FBI typology approach has some validity.

However, Godwin (2002) argues that, in reality, most killers have multiple contrasting characteristics and don't fit into one 'type'. This suggests that the organised–disorganised typology is probably more of a continuum.

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1. In the top-down approach the profiler matches the crime/offender to pre-existing templates. Murderers or rapists are classified in one of two categories (organised and disorganised) based on this evidence.

Unlike the US top-down approach, the British bottom-up model does not begin with fixed typologies. Instead, the profile is 'data-driven' and emerges as the investigator rigorously scrutinises the details of a particular offence.

2. Lundrigan and Canter (2001) collated information from 120 murder cases involving serial killers in the US. Smallest space analysis revealed spatial consistency in the behaviour of the killers. The location of each body disposal site was plotted and a 'centre of gravity' was identified – the offender's base was invariably in the centre of the pattern. The effect was more noticeable for 'marauders' (offenders travelling short distances). This supports Canter's claim that spatial information can be a key factor in determining the base of an offender, and thus aiding their identification.

3. One strength is that evidence supports investigative psychology. Canter and Heritage (1990) conducted an analysis of 66 sexual assault cases using smallest space analysis. Several behaviours were identified in most cases (e.g. using impersonal language). Each individual displayed a pattern of such behaviours, and this helps establish whether two or more offences were committed by the same person (known as 'case linkage'). This supports one of the basic principles of investigative psychology (and the bottom-up approach) that people are consistent in their behaviour.

4. Unlike the US top-down approach, the British bottom-up model does not begin with fixed typologies. Instead, the profile is 'data-driven' and emerges as the investigator rigorously scrutinises the details of a particular offence. The aim is to generate a picture of the offenders' characteristics, routines and background through analysis of the evidence.

In investigative psychology, statistical procedures detect patterns of behaviour that are likely to occur (or coexist) across crime scenes. This is done to develop a statistical 'database' which then acts as a baseline for comparison. Features of an offence can be matched against this database to

suggest potentially important details about the offender, their personal history, family background, etc. A central concept is interpersonal coherence – the way an offender behaves at the scene (including how they 'interact' with the victim) may reflect their behaviour in everyday situations (e.g. controlling, apologetic, etc.); i.e. their behaviour 'hangs together' (has coherence). This might tell the police something about how the offender relates to women (for example) more generally.

In geographical profiling the locations of crime scenes are used to infer the likely home or operational base of an offender – known as 'crime mapping'. Location can also be used alongside psychological theory to create hypotheses about the offender and their modus operandi (habitual way of working).

One strength is that evidence supports investigative psychology. Canter and Heritage (1990) conducted an analysis of 66 sexual assault cases using smallest space analysis. Several behaviours were identified in most cases (e.g. using impersonal language). Each individual displayed a pattern of such behaviours, and this helps establish whether two or more offences were committed by the same person (known as 'case linkage'). This supports one of the basic principles of investigative psychology (and the bottom-up approach) that people are consistent in their behaviour.

However, the database is made up of only solved crimes which are likely to be those that were straightforward to link together. This is a circular argument and suggests that investigative psychology may tell us little about crimes that have few links between them and therefore remain unsolved.

Another strength is that evidence also supports geographical profiling. Lundrigan and Canter (2001) collated information from 120 murder cases in the US. Smallest space analysis revealed spatial consistency – a centre of gravity. Whereas offenders leave their home base in different directions when dumping a body, this creates a circular effect, especially in the case of marauders. This supports the view that geographical information can be used to identify an offender.

One limitation is that geographical profiling may not be sufficient on its own. Recording of crime is not always accurate, it can vary between police forces and an estimated 75% of crimes are not even reported to police. Even if crime data is correct, other factors are important, e.g. timing of the offence and the age and experience of the offender (Ainsworth 2001). This suggests that geographical information alone may not always lead to the successful capture of an offender.

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1. Lombroso proposed that criminals were 'genetic throwbacks' – a primitive sub-species who were biologically different from non-criminals. This is the 'atavistic form'. Offenders were seen by Lombroso as lacking evolutionary development. Their savage and untamed nature meant that they would find it impossible to adjust to civilised society and would inevitably turn to crime.

2. Lombroso proposed that criminals were 'genetic throwbacks' – a primitive sub-species who were biologically different from non-criminals. This is the 'atavistic form'. Offenders were seen by Lombroso as lacking evolutionary development. Their savage and untamed nature meant that they would find it impossible to adjust to civilised society and would inevitably turn to crime. Therefore Lombroso saw offending behaviour as an innate tendency and thus was proposing a new perspective (for his time) that the offender was not at fault. In this way his ideas were revolutionary. Lombroso argued the offender subtype could be identified as being in possession of physiological 'markers'. These 'atavistic' characteristics are biologically determined and are mainly features of the head and face that make criminals appear physically different from the rest of us. For example, the atavistic

form included a narrow, sloping brow, a strong prominent jaw, high cheekbones and facial asymmetry.

3. One strength of Lombroso's theory is it changed criminology. Lombroso (the 'father of modern criminology', Hollin 1989) shifted the emphasis in crime research away from moralistic to scientific. Also, in describing how particular types of people are likely to commit particular types of crime, the theory heralded offender profiling. This suggests that Lombroso made a major contribution to the science of criminology.

However, many of the features that Lombroso identified as atavistic (curly hair, dark skin) are most likely to be found among people of African descent, a view that fitted 19th-century eugenic attitudes (to prevent some groups from breeding). This suggests that his theory might be more subjective than objective, influenced by racist prejudices.

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One limitation is evidence contradicts the link between atavism and crime. Goring (1913) compared 3000 offenders and 3000 non-offenders and found no evidence that offenders are a distinct group with unusual facial and cranial characteristics. He did suggest though that many people who commit crime have lower-than-average intelligence (offering limited support for atavistic theory). This challenges the idea that offenders can be physically distinguished from the rest of the population, therefore they are unlikely to be a subspecies.

Another limitation is Lombroso's methods were poorly controlled. Lombroso didn't compare his offender sample with a control group, and therefore failed to control confounding variables. For example, modern research shows that social conditions (e.g. poverty) are associated with offending behaviour, which would explain some of Lombroso's links (Hay and Forrest 2009). This suggests that Lombroso's research does not meet modern scientific standards.

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1. Crowe (1972) found that adopted children who had a biological mother with a criminal record had a 50% risk of having a criminal record at 18 years of age. Whereas adopted children whose mother didn't have a criminal record only had a 5% risk.

A genetic analysis of about 800 offenders by Tiihonen *et al.* (2015) suggested two genes that may be associated with violent crime. The MAOA gene regulates serotonin and has been linked to aggressive behaviour. The CDH13 gene is linked to substance abuse and ADHD. The study found that 5–10% of all severe violent crime in Finland is attributable to the MAOA and CDH13 genotypes.

2. Twin and adoption studies suggest genes predispose offenders to crime. Christiansen (1977) studied over 3500 twin pairs in Denmark, finding a concordance for offender behaviour of 35% for MZ males and 13% for DZ males (slightly lower rates for females). This supports a genetic component in offending.

There may be neural differences in the brains of offenders and non-offenders. Raine *et al*. (2000) found reduced activity and an 11% reduction in the volume of grey matter in the prefrontal cortex of people with APD compared to controls. This is the part of the brain that regulates emotional behaviour.

3. One strength is support for the link between crime and the frontal lobe. Kandel and Freed (1989) researched people with frontal lobe damage, including the prefrontal cortex. They found evidence of impulsive behaviour, emotional instability and inability to learn from mistakes. This supports the idea that structural abnormalities in the brain are a causal factor in offending behaviour.

One limitation is the link between neural differences and APD is complex. Farrington *et al*. (1981) studied adult males with high APD scores. They were raised by a convicted parent and physically neglected. These early experiences may have caused APD and associated neural differences, e.g. reduced activity in the frontal lobe due to trauma. This suggests that the relationship between neural differences, APD and offending is complex and there may be intervening variables.

4. The genetic explanation of offending behaviour is supported by twin and adoption studies, which suggest that genes predispose offenders to crime. Christiansen (1977) studied over 3500 twin pairs in Denmark, finding a concordance for offender behaviour of 35% for MZ males and 13% for DZ males (slightly lower rates for females). This supports a genetic component in offending.

Crowe (1972) also found that adopted children who had a biological mother with a criminal record had a 50% risk of having a criminal record at 18 years of age. Whereas adopted children whose mother didn't have a criminal record only had a 5% risk.

One limitation of genetic explanations is that twin studies assume equal environments, i.e. that environmental factors are the same for MZ and DZ twins because they experience similar environments. However, because MZ twins look identical, people (especially parents) tend to treat them more similarly which, in turn, affects their behaviour. Therefore higher concordance rates for MZs may be because they are treated more similarly than DZs, suggesting conclusions lack validity.

One strength is the support for a diathesis-stress model of offending. Mednick *et al*. (1984) studied 13,000 Danish adoptees having at least one court conviction. They found that conviction rates were 13.5% (where neither biological nor adoptive parents had convictions), 20% (one biological parent had a conviction), and 24.5% (where both adoptive and biological parents had a conviction). This

data suggests that both genetic inheritance and the environment influence criminality – supporting the diathesis-stress model of crime.

The neural explanation of offending behaviour proposes there may be neural differences in the brains of offenders and non-offenders. For example, antisocial personality disorder (APD) is associated with a lack of empathy and reduced emotional responses. Many convicted offenders have a diagnosis of APD. Raine *et al*. (2000) found reduced activity and an 11% reduction in the volume of grey matter in the prefrontal cortex of people with APD compared to controls. This is the part of the brain that regulates emotional behaviour.

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1. Eysenck suggested personality types are innate and based on the nervous system we inherit. Extraverts have an underactive nervous system, which means they seek excitement and stimulation and engage in risk-taking. Neurotic individuals have a high level of reactivity in the sympathetic nervous system – they respond quickly to situations of threat (fight or flight). This means they tend to be nervous, jumpy and overanxious so their behaviour is difficult to predict. Psychotic individuals are suggested to have higher levels of testosterone – they are cold, unemotional and prone to aggression.

The criminal personality type is a combination of personality types: neurotic extravert + high psychoticism. To explain, neurotics are unstable and therefore prone to overreact to situations of threat. Extraverts seek more arousal and thus engage in dangerous activities. Psychotics are aggressive and lacking empathy.

Eysenck saw criminal behaviour as developmentally immature in that it is selfish and concerned with immediate gratification. Criminals are impatient and cannot wait for things – so they are more likely to act antisocially.

2. Eysenck and Eysenck (1977) compared 2070 male prisoners' scores on the EPQ with 2422 male controls. On measures of E, N and P (across all the age groups that were sampled) prisoners recorded higher average scores than controls. This agrees with the predictions of the theory that offenders rate higher than average across the three dimensions Eysenck identified.

However, Farrington *et al*. (1981) conducted a meta-analysis and reported that offenders tended to score high on measures of P, but not for E and N. Also there is inconsistent evidence of different cortical arousal in extraverts and introverts (Küssner 2017). This means that some of the central assumptions of the criminal personality have been challenged.

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Cruz would appear to have an extravert personality as he is charming, friendly and outgoing. He is also unfeeling, selfish, anxious and tense. Cruz's unfeeling and selfish nature suggests he would score high on measures of psychoticism. His anxiety and tenseness are characteristics of neuroticism. Thus, Cruz would appear to have all three elements of the criminal personality so it comes as little surprise that he is currently in prison for serious assault.

One limitation is the view that all offending is explained by personality. Moffitt (1993) distinguished between offending behaviour that only occurs in adolescence (adolescence-limited) and that which continues into adulthood (life-course-persistent). She considers persistence in offending behaviour to be a reciprocal process between individual personality traits and environmental reactions to those traits. This is a more complex picture than Eysenck suggested, that offending behaviour is determined by an interaction between personality and the environment.

Another limitation is cultural factors are not taken into account. Bartol and Holanchock (1979) studied Hispanic and African-American offenders in a New York maximum security prison, dividing them into six groups based on offending history and offences. All six groups were less extravert than a non-offender control group. Bartol and Holanchock suggested this was because the sample was a different cultural group from that investigated by Eysenck. This questions the generalisability of the criminal personality – it may be a culturally relative concept.

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1. Hostile attribution bias describes where ambiguous situations are judged as threatening. Schönenberg and Jusyte (2014) found violent offenders were more likely than non-offenders to perceive ambiguous facial expressions as angry and hostile. Offenders misread non-aggressive cues (e.g. being 'looked at') and this can trigger a disproportionate and violent response.

Minimalisation describes the downplaying of the significance of a crime in a way that reduces a person's sense of guilt. For example, burglars may describe themselves as 'doing a job' or 'supporting my family' as a way of minimising the seriousness of their actions and their sense of guilt. This is particularly likely in sex offenders – Barbaree (1991) found that 54% rapists denied they

had committed an offence at all and a further 40% minimised the harm they had caused to the victim.

2. Kohlberg proposed that people's decisions and judgements about right and wrong can be identified in his stage theory of moral development. The higher the stage the more sophisticated the reasoning. Kohlberg *et al*. (1973) used a moral dilemma technique (e.g. the Heinz dilemma) and found offenders tend to be at the pre-conventional level, whereas non-criminals progress to the conventional level and beyond.

The pre-conventional level is characterised by a need to avoid punishment and gain rewards and a less mature, childlike reasoning. Offenders may commit crime if they can get away with it or gain rewards (e.g. money, respect). Research shows that offenders are often self-centred (egocentric) and display poorer social perspective-taking skills (Chandler 1973). Individuals who reason at a higher level tend to empathise more and exhibit behaviours such as honesty, generosity and non-violence.

3. One limitation is cognitive distortions depend on the type of offence. Howitt and Sheldon (2007) found that non-contact sex offenders (accessed sexual images on the internet) used more cognitive distortions than contact sex offenders (physically abused children). Those who had a previous history of offending were also more likely to use distortions as a justification for their behaviour. This suggests that cognitive distortions are not used in the same way by all offenders.

4. Kohlberg proposed that as children get older their decisions and judgements about right and wrong become more sophisticated. A person's level of reasoning (thinking) affects their behaviour. Offenders are at a lower, less mature level. Kohlberg *et al*. (1973) used a moral dilemma technique (e.g. the Heinz dilemma) and found that offenders tend to be at the preconventional level, whereas non-offenders progress higher. The pre-conventional level is characterised by a need to avoid punishment and gain rewards and a less mature, childlike reasoning. Offenders may commit crime if they can get away with it or gain rewards (e.g. money, respect).

One strength is that evidence supports the role of moral reasoning. Palmer and Hollin (1998) compared moral reasoning of offenders and non-offenders on a SRM-SF scale (11 moral dilemmas). Offenders showed less mature moral reasoning than the non-offender group (e.g. not taking things that belong to someone else). This is consistent with Kohlberg's theory, and suggests his theory of criminality has validity.

One limitation is that moral reasoning may depend on the type of offence. Thornton and Reid (1982) found that people whose crimes were for financial gain (e.g. robbery) were more likely to show a pre-conventional level than if their crime was impulsive (e.g. assault). Pre-conventional moral reasoning tends to be associated with crimes in which offenders believe they have a good chance of evading punishment. This suggests that Kohlberg's theory may not apply to all forms of crime.

There are two cognitive biases linked to offending: hostile attribution bias and minimisation.

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'supporting my family' as a way of minimising the seriousness of their actions and their sense of guilt.

One strength of cognitive distortions is its application to therapy. In cognitive behaviour therapy, offenders are helped to 'face up' to what they have done and have a less distorted view of their actions. Studies (e.g. Harkins *et al*. 2010) suggest that reduced denial and minimalisation in therapy is associated with less reoffending. This suggests that the theory of cognitive distortions has practical value.

One limitation is cognitive distortions depend on the type of offence. Howitt and Sheldon (2007) found that non-contact sex offenders (accessed sexual images on the internet) used more cognitive distortions than contact sex offenders (physically abused children). Those who had a previous history of offending were also more likely to use distortions as a justification for their behaviour. This suggests that cognitive distortions are not used in the same way by all offenders.

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1. Sutherland (1924) developed a set of scientific principles that could explain all types of offending. Individuals learn the values, attitudes, techniques and motives for offending behaviour through interaction with others – these 'others' are different from one person to the next (hence, differential association). His theory ignores the effects of class or ethnic background, what matters is who you associate with.

Offending behaviour is acquired through the process of learning. Learning occurs through interactions with significant others who the child values most and spends most time with, such as family and peer group. Offending arises from two factors: learned attitudes towards offending and learning of specific offending acts. When a person is socialised into a group they will be exposed to certain values and attitudes. This includes values and attitudes toward the law – some of these will be pro-crime, some will be anti-crime. Sutherland argues that if the number of pro-crime attitudes the person comes to acquire outweighs the number of anti-crime attitudes, they will go on to offend.

2. One difference between differential association theory and the genetic theory of offending is where offending is seen to originate. Sutherland's theory argues that offending behaviour is the result of nurture, i.e. it develops within a dysfunctional family environment and is learned through association with inappropriate role models. The genetic theory meanwhile emphasises the role of nature, i.e. that offending behaviour is innate and the result of an inherited predisposition.

3. One strength of differential association theory is the shift of focus. Sutherland moved emphasis away from early biological explanations (e.g. Lombroso) and from theories of offending as the product of individual weakness or immorality. Differential association theory draws attention to deviant social circumstances and environments as being more to blame for offending than deviant people. This approach offers a more realistic solution to offending instead of eugenics (the biological solution) or punishment (the morality solution).

However, the theory risks stereotyping people from impoverished, crime-ridden backgrounds. This ignores that people may choose not to offend despite such influences, as not everyone who is exposed to pro-crime attitudes goes on to offend.

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However, the theory risks stereotyping people from impoverished, crime-ridden backgrounds, which is the viewpoint of the politician. This ignores that people may choose not to offend despite such influences, as not everyone who is exposed to pro-crime attitudes goes on to offend.

Another strength is that the theory has wide reach. Whilst some crimes (e.g. burglary) are clustered in inner-city working class communities, other crimes are clustered in more affluent groups, as the psychologist points out. Sutherland was particularly interested in so-called 'white-collar' or corporate offences and how this may be a feature of middle-class groups who share deviant norms. This shows that it is not just the 'lower' classes who commit offences and that differential association can be used to explain all offences.

One limitation is difficulty testing the theory's predictions. Sutherland promised a scientific and mathematical framework for predicting offending behaviour, but the concepts can't be operationalised. It is unclear how we can measure the numbers of pro- or anti-crime attitudes a person is exposed to – so how can we know at what point offending would be triggered? This means the theory does not have scientific credibility.

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1. Freud's psychodynamic approach suggests that the Superego is guided by the morality principle leading to feelings of guilt for wrongdoing. Blackburn (1993) argued that if the Superego is inadequate (weak, deviant or over-harsh) then the Id (governed by the pleasure principle) is given 'free rein' – an uncontrolled Id means that offending behaviour is inevitable.

A weak Superego comes about through absence of the same-sex parent. During the phallic stage the Superego is formed through the resolution of the Oedipus complex (or Electra complex). If the same-sex parent is absent during this stage a child cannot internalise a fully-formed Superego as there is no opportunity for identification. This would make offending behaviour more likely.

The deviant Superego is when the child internalises deviant values. A child internalises the same-sex parent's moral attitudes to form their Superego. If these internalised moral attitudes are deviant this would lead to a deviant Superego and to offending behaviour.

Finally, an over-harsh Superego occurs when committing crimes satisfies a need for punishment. An excessively punitive or overly harsh parent creates a child who has an over-harsh Superego and the child is crippled by guilt and anxiety. This may (unconsciously) drive the individual to perform criminal acts in order to satisfy the Superego's overwhelming need for punishment.

2. One psychodynamic explanation of offending behaviour is Bowlby's maternal deprivation theory. Bowlby (1944) argued that a warm, continuous relationship with a mother-figure was crucial to future relationships, well-being and development. A loss of attachment in infancy (maternal deprivation) could lead to affectionless psychopathy (lack of empathy and guilt) and increased likelihood of delinquency.

Kohlberg proposed that people's decisions and judgements about right and wrong can be identified in his stage theory of moral development. The higher the stage the more sophisticated the reasoning. Kohlberg *et al*. (1973) used a moral dilemma technique and found criminal offenders tend to be at the pre-conventional level – non-criminals progress to the conventional level and beyond.

The pre-conventional level is characterised by a need to avoid punishment and gain rewards and less mature, childlike reasoning. Offenders may commit crime if they can get away with it or gain rewards (e.g. money, respect).

3. One limitation of Freudian theory is that it is gender-biased. Psychodynamic theory assumes girls develop a weaker Superego than boys – they do not experience castration anxiety, so have less need to identify with their mothers. However, there are 20 times more men than women in prison and Hoffman (1975) found no gender differences in children's moral behaviour. This suggests there is alpha bias at the heart of Freud's theory and means it may not be appropriate as an explanation of offending behaviour.

Another limitation is that Bowlby's theory is based on an association. Lewis (1954) analysed 500 interviews with young people, and found that maternal deprivation was a poor predictor of future offending and the ability to form close relationships in adolescence. Even if there is a link there are countless other reasons for it, for example maternal deprivation may be due to growing up in poverty. This suggests that maternal deprivation may be one of the reasons for later offending behaviour, but not the only reason.

4. Freud proposed that the Superego is guided by the morality principle and leads to feelings of guilt for wrongdoing and feelings of pride for moral behaviour. Blackburn (1993) argued that if the Superego is somehow inadequate then the Id (governed by the pleasure principle) is given 'free rein' and is not properly controlled – an uncontrolled id means that criminal behaviour is inevitable. There are three types of 'inadequate' Superego: weak, deviant or over-harsh.

Bowlby (1944) argued that a warm, continuous relationship with a mother-figure was crucial to future relationships, well-being and development. A loss of attachment in infancy (maternal deprivation) could lead to affectionless psychopathy (lack of empathy and guilt) and increased likelihood of delinquency. Bowlby supported his claims with his investigation of 44 juvenile thieves. He found that 14 of the thieves showed signs of affectionless psychopathy – 12 of these had experienced prolonged separation from their mothers in infancy. In a control group, only two had experienced prolonged separation (maternal deprivation). Bowlby concluded that the effects of

maternal deprivation had caused affectionless psychopathy and delinquent behaviour among juvenile thieves.

Ashton can be very cruel to others but never seems to feel any guilt. This suggests he has an inadequate Superego – the part of the personality that forces the Ego to experience guilt for wrongdoing. Without an adequately functioning Superego, the Id is allowed free rein and is not properly controlled. Ashton never expresses warmth or positive emotion towards others. This may suggest he has developed the affectionless psychopathy personality type, which is characterised by lack of empathy and cruelty. This may have come about through maternal deprivation in Ashton's childhood but we cannot know this from the text.

One strength is research support for the link to the Superego. Goreta (1991) conducted a Freudian-style analysis of ten offenders referred for psychiatric treatment. In all those assessed, disturbances in Superego formation were diagnosed. Each offender experienced the need for punishment manifesting itself as a desire to commit acts of wrongdoing and offend (possibly due to an overharsh Superego). This evidence seems to support the role of psychic conflicts and an over-harsh Superego as a basis for offending.

If this theory were correct though we would expect harsh, punitive parents to raise children who often experience guilt. Evidence suggests that the opposite is true – such children rarely express guilt (Kochanska *et al.* 2001). This calls into question the relationship between a strong, punitive internal parent and excessive feelings of guilt within the child.

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Page 221

1. Token economy systems are managed by prison staff to modify the behaviour of inmates. Based on operant conditioning, desirable inmate behaviours are rewarded (reinforced) with tokens. Desirable behaviours might include avoiding conflict, being quiet in the cell, following rules and so on. Tokens are not rewarding in themselves but they are rewarding because they can be exchanged for something desirable. The subsequent reward will vary according to the institution, but may include exchanging tokens for a phone call to a loved one, time in the gym or exercise yard, extra cigarettes or food.

2. Recidivism refers to reoffending. Recidivism rates in ex-prisoners tell us to what extent prison acts as an effective deterrent. Rates vary with age, crime committed and country. The US, Australia and Denmark record rates over 60%. In Norway rates may be as low as 20% (Yukhnenko *et al*. 2019). This

last figure is significant because in Norway there is less emphasis on incarceration and greater emphasis on rehabilitation and skills development.

3. One limitation is the negative effects of custodial sentencing. Bartol (1995) said prison is 'brutal, demeaning and generally devastating'. Suicide rates in prisons (England and Wales) are nine times higher than in the general population. The Prison Reform Trust (2014) found that 25% of women and 15% of men in prison reported symptoms of psychosis (e.g. schizophrenia). This supports the view that oppressive prison regimes may be detrimental to psychological health which could impact on rehabilitation.

One strength is that prison provides training and treatment. The Vera Institute of Justice (Shirley 2019) claims that offenders who take part in college education programmes are 43% less likely to reoffend following release. This will improve employment opportunities on release, which reduces the likelihood of reoffending. This suggests that prison may be a worthwhile experience assuming offenders are able to access these programmes.

4. There are several psychological effects that are associated with time in prison. First, stress and depression – suicide rates and self-harm are higher in prison than in the general population. Dagny's self-harming suggests she is suffering psychologically in prison and is experiencing stress and depression.

Second, institutionalisation, which describes the inability to function outside of prison having adapted to the norms and routines of prison life. Dagny has forgotten how to do things for herself, which suggests she has become too accustomed to the norms and routines of prison life. She may struggle to adjust to life on the 'outside' if she were ever released.

Third, prisonisation, which describes behaviours that are unacceptable outside prison and which are encouraged via socialisation into an 'inmate code'. Dagny is no longer shocked by what goes on inside prison. This suggests she has become socialised into the 'inmate code' and sees things that would be unacceptable outside prison as trivial and 'run of the mill'.

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Prisons can become 'universities for crime'. Alongside the legitimate skills that offenders may acquire during their time in prison, they may also undergo a more dubious 'education'. Differential association theory suggests time spent with hardened criminals may give younger inmates the chance to learn 'tricks of the trade' from experienced offenders. This may undermine attempts to rehabilitate prisoners, making reoffending more likely.

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1. Behaviour modification programmes are designed with the aim of reinforcing obedient behaviour whilst punishing disobedience in the hope that it dies out (becomes extinct). It is based on operant conditioning because desirable inmate behaviours are rewarded (reinforced) with tokens. Desirable behaviours might include avoiding conflict, being quiet in the cell, following rules and so on.

2. Behaviour modification programmes are based on operant conditioning – desirable inmate behaviours are rewarded (reinforced) with tokens. Desirable behaviours might include avoiding confrontation, being quiet in the cell, following rules. Tokens may also be removed as a form of punishment. Tokens are secondary reinforcers. This means that tokens are not rewarding in themselves but they are rewarding because they can be exchanged for something desirable (a primary reinforcer).

Primary reinforcers might include a phone call to a loved one, time in the gym, extra cigarettes or food. Target behaviours within the custodial setting are operationalised by breaking them down into components parts e.g. 'interaction with other prisoners' may be broken down into 'speaking politely to others', 'not touching others', etc. Each 'unit' of behaviour should be objective and measurable and agreed with staff and prisoners in advance.

3. A strength of behaviour modification is that it is easy to implement. Behaviour modification does not need a specialist professional involved, whereas this is true for other forms of treatment (e.g. anger management). Token economy systems can be designed and implemented by virtually anyone. They are cost-effective and easy to follow once methods have been established. This suggests that behaviour modification techniques can be established in most prisons and accessed by most prisoners.

One limitation is that there is little rehabilitative value. Some treatments (e.g. anger management) are longer lasting because they involve understanding causes of, and taking responsibility for, one's own behaviour. In contrast, offenders can 'play along' with a token economy system to access rewards, but this produces little change in their overall character. This may explain why, once the token economy is discontinued, an offender may quickly regress back to their former behaviour.

4. The behaviourist approach proposes that behaviour is learned and therefore it should be possible to unlearn behaviour using the same principles. Behaviour modification programmes are designed with the aim of reinforcing obedient behaviour whilst punishing disobedience in the hope that it dies out (becomes extinct). Tokens are given to reinforce desirable behaviours. Token economy systems are managed by prison staff to modify the behaviour of inmates. This is based on operant conditioning – desirable inmate behaviours are rewarded (reinforced) with tokens. Desirable behaviours might include avoiding conflict, being quiet in the cell, following rules and so on.

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Novaco (1975) suggests that cognitive factors trigger the emotional arousal that comes before aggressive acts. Novaco's argument is that, in some people, anger is quick to surface in situations they perceive to be threatening or anxiety-inducing. Anger management programmes are a form of cognitive behaviour therapy (CBT) in which the individual is taught to recognise the cognitive factors that trigger their anger and loss of control and develop behavioural techniques that bring about conflict resolution without the need for violence.

One limitation is that success depends on individual factors. Howells *et al*. (2005) found that participation in an anger management programme had little overall impact when compared to a control group who received no treatment. However, progress was made with offenders who showed intense levels of anger before the programme and offenders who were motivated to change ('treatment readiness'). This suggests that anger management may only benefit offenders who fit a certain profile.

Another limitation is that anger management is expensive. Anger management programmes require highly-trained specialists who are used to dealing with violent offenders. Many prisons may not have the resources. In addition, change takes time and commitment, and this is ultimately likely to add to the expense of delivering effective programmes. This suggests that effective anger management programmes are probably not going to work in most prisons.

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Stage 1 is cognitive preparation. This stage requires the offender to reflect on past experience – they learn to identify triggers to anger and the ways their interpretation of events may be irrational. For instance, the offender may interpret someone looking at them as confrontation. In redefining the situation as non-threatening, the therapist is attempting to break what may be an automatic response for the offender.

Stage 2 is skills acquisition. Offenders are introduced to a range of techniques and skills to help them deal with anger-provoking situations. Techniques may be cognitive (positive self-talk to promote calmness), behavioural (assertiveness training to communicate more effectively, becoming automatic if practised) and physiological (methods of relaxation and/or meditation).

Stage 3 is application practice. Offenders are given the opportunity to practise their skills in a carefully monitored environment. For example, role play between the offender and therapist may involve re-enacting scenarios that led to anger and violence in the past. If the offender deals successfully with the role play this is given positive reinforcement by the therapist.

One strength is that benefits outlast behaviour modification. Unlike behaviour modification, anger management tackles the causes of offending, i.e. the cognitive processes that trigger anger, and ultimately, offending behaviour. This may give offenders new insight into the cause of their criminality, allowing them to self-discover ways of managing themselves outside of prison. This suggests that anger management is more likely than behaviour modification to lead to permanent behavioural change.

However, whilst anger management may have an effect on offenders in the short term, it may not help cope with triggers in real-world situations (Blackburn 1993). This suggests that, in the end, anger management may not reduce reoffending.

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Page 227

1. Restorative justice (RJ) is a process of managed collaboration between offender and survivor (the preferred term for 'victim') based on the principles of healing and empowerment. The survivor is given the opportunity to explain how the incident affected them (including emotional distress) – an important part of the rehabilitative process.

Novaco (1975) suggests that cognitive factors trigger the emotional arousal that comes before aggressive acts. Novaco's argument is that, in some people, anger is quick to surface in situations they perceive to be threatening or anxiety-inducing. Anger management programmes are a form of cognitive behaviour therapy (CBT).

2. Restorative justice is less about 'retribution' – that is, punishing the offender and more about 'reparation' – repairing the harm caused. RJ seeks to focus on two things: the survivor (victim) of the crime and their recovery and the offender and their recovery/rehabilitation process.

RJ programmes can be quite diverse but most share key features. A trained mediator supervises the meeting in a non-courtroom setting where the offender voluntarily meets with the survivor(s). The meeting is face-to-face or remote via video link. The survivor explains how the incident affected them, so the offender can understand the effects of their crime. Thereis active rather than passive involvement of all parties with a focus on positive outcomes for both survivors and offenders. Other relevant community members may be involved and explain further consequences (e.g. neighbours, friends, family members). RJ may occur pre-trial and may affect sentencing, it may be given as an alternative to prison (especially if the offender is young) or it can take place while the offender is serving a prison sentence, as an incentive to reduce the length of the sentence.

3. One strength of RJ is that it supports the needs of survivors. The Restorative Justice Council (Shapland *et al*. 2008) reported the results of a 7-year project, 85% of survivors said they were satisfied with the process, 78% would recommend it, about 60% said the process made them feel better about the incident, and 2% said it made them feel worse. This suggests that restorative justice is a worthwhile experience and helps survivors of crime cope with the aftermath of the incident.

However, RJ programmes are not always as survivor-focused as reported in satisfaction surveys. Survivors of crime may be used to help rehabilitate offenders, not the other way round (Wood and Suzuki 2016). This suggests that the needs of the survivor may be seen as secondary to the need to rehabilitate offenders.

Another strength is that RJ leads to a decrease in offending. In a meta-analysis, Strang *et al.* (2013) found offenders who experienced RJ were less likely to reoffend – though reduction was larger in cases of violent crime compared with property crime. Bain (2012) found lowered recidivism with adult offenders who had one-to-one contact with their survivor (rather than community contact). This suggests that RJ has a positive impact on reoffending, maybe more so for some types of offence than others and some approaches.

One limitation is that offenders may abuse the system. The success of RJ hinges on an offender genuinely feeling regret for their actions. Van Gijseghem (2003) suggests that offenders may use restorative justice to avoid punishment, play down their faults or even take pride in their relationship with the survivor. This would explain why not all offenders ultimately benefit from restorative justice and go on to reoffend.

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However, whilst anger management may have an effect on offenders in the short term, it may not help cope with triggers in real-world situations (Blackburn 1993). This suggests that, in the end, anger management may not reduce reoffending.

Chapter 13 Addiction

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1. Addiction is a disorder in which a person takes a substance or carries out a behaviour that provides pleasure but eventually becomes compulsive and has harmful consequences. It is marked by psychological and/or physical dependence, tolerance and withdrawal. For example, someone may be addicted to smoking if they experience physical withdrawal symptoms and strong cravings (dependence) when they cannot smoke, and find they need to smoke more in order to get the same effect (tolerance).

2. Physical dependence occurs when a withdrawal syndrome is produced by stopping the drug whereas psychological dependence refers to the compulsion to experience the rewarding effects of a drug (cravings).

Physical dependence can only be determined when the individual reduces or stops their intake/behaviour and withdrawal appears, whereas psychological dependence is experienced by the individual throughout the process of taking a drug/carrying out a behaviour.

3. Tolerance occurs when an individual's response to a drug is reduced. This means they need even greater doses to produce the same effect on behaviour. Tolerance is caused by repeated exposure to a drug.

A withdrawal syndrome is a collection of symptoms associated with abstaining from a drug or reducing its use. Symptoms are usually the opposite of those created by the drug. For example, withdrawal of nicotine leads to irritability, anxiety, etc.

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1. A risk factor is any internal or external influence that increases the likelihood that a person will start using addictive substances or engage in addictive behaviours. Examples include peer influences, family influences, genetic vulnerability and stress. These factors also contribute to someone increasing their current level of use/engagement.

2. Peers are an important risk factor in addiction. In fact, relationships with friends become the most important risk factor as children get older, as they become increasingly independent of family influences. Even when an adolescent's peers have not used drugs themselves, their attitudes towards them can still be highly influential.

3. Some people may inherit from their parents a vulnerability or predisposition to dependence. The mechanism for this could be that genes determine the activity of neurotransmitter systems such as dopamine. These systems in turn affect behaviours that predispose someone to dependence, e.g. impulsivity. For example, the number of dopamine D2 receptors in the brain is genetically controlled and addiction is associated with an abnormally low concentration of them.

A strength of this explanation is that there is research support for it from adoption studies. For example, Kendler *et al*. (2012) investigated Swedish adults who, as children, had been adopted away from biological families in which at least one parent had an addiction. Compared with a control group, these adults had a significantly increased risk of developing an addiction themselves. This finding is supported by twin studies and strongly suggests that genetic predisposition may be the central risk factor in addiction.

This is further supported when we look at the roles of other factors. No single risk factor is causal in addiction, but they all appear to interact with a genetic vulnerability. Peer and family influences, stress and personality are all proximate factors and you need to go further back in the chain of causes to explain them. Therefore, genetic vulnerability may be the ultimate factor that influences all the others.

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1. Family influences: Parents may approve of addiction. Livingston *et al*. (2010) found when parents allowed their children to drink alcohol at home in their final school year, their children were more likely to drink excessively at college the next year. Parents may simply have little interest in monitoring their child's behaviour. Adolescents are more likely to start using alcohol where it is an everyday feature of family life or where there is a history of alcohol addiction.

Peers: Peer behaviour does not have to specifically concern drugs. Instead a group norm that favours rule-breaking generally can be influential. O'Connell *et al*. (2009) suggest there are three major elements to peer influence for alcohol addiction. First, attitudes about drinking are influenced by associating with peers who use alcohol. Second, peers provide more opportunities to use alcohol. Third, individuals overestimate how much their peers are drinking and attempt to keep up with the perceived norm.

2. Some people may inherit from their parents a vulnerability or predisposition to dependence. The mechanism for this could be that genes determine the activity of neurotransmitter systems such as dopamine. These systems in turn affect behaviours that predispose someone to dependence, e.g. impulsivity. For example, the number of dopamine D2 receptors in the brain is genetically controlled and addiction is associated with an abnormally low concentration of them. Fewer receptors means less dopamine activity. As dopamine is associated with pleasurable reward, addiction may be a way of compensating for a lack of reward due to dopamine deficiency.

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A limitation of stress as a risk factor is to do with cause and effect. Many studies have shown a strong positive correlation between stressful experiences and addiction behaviours. But stress may not be a risk factor – it depends which develops first. The addiction then creates stress because of its negative effects on relationship and finances, etc. Stress and addiction are thus strongly correlated but in this case the addiction caused the stress. Therefore correlational studies – common in this area – cannot help us choose between these two competing explanations of the link.

4. Tim's risk of addiction may best be explained in terms of genetic vulnerability. Some people may inherit from their parents a vulnerability or predisposition to dependence. The mechanism for this could be that genes determine the activity of neurotransmitter systems such as dopamine. These systems in turn affect behaviours that predispose someone to dependence, e.g. impulsivity. For example, the number of dopamine D2 receptors in the brain is genetically controlled and addiction is associated with an abnormally low concentration of them. As Tim comes from a family of people addicted to alcohol, he may have inherited a genetic predisposition to reduced D2 receptors in the brain.

A strength of the genetic vulnerability explanation is that there is research support for it from adoption studies. For example, Kendler *et al*. (2012) investigated Swedish adults who, as children, had been adopted away from biological families in which at least one parent had an addiction. Compared with a control group, these adults had a significantly increased risk of developing an addiction themselves. This finding is supported by twin studies and strongly suggests that genetic predisposition may be the central risk factor in addiction.

However, it should be noted that Tim has not inherited an 'alcohol addiction' as such. He may have inherited a vulnerability that is triggered by other risk factors. These other factors might not be experienced by Tim (e.g. no stressful life events). So there is nothing inevitable about Tim developing an addiction just because it is common in his family.

Evidence suggests there is no 'addictive personality' so perhaps Kim can be reassured that there is no 'sort of person' who is addicted to gambling. However, some traits (e.g. hostility) may be linked to addiction. Antisocial personality disorder (APD) is strongly correlated with addiction-related behaviour and begins in early adolescence. The key component is impulsivity: risk-taking, a lack of planning and a preference for immediate gratification. Kim may be concerned that she has some of these traits and this could increase her risk of gambling addiction.

Jim may already be a smoker but the stress he is experiencing might have increased his usage. This could be a response to traumatic events that Jim experienced in childhood, which may influence how he copes with stressors. Andersen and Teicher (2008) argue that early experiences of trauma have damaging effects on the developing brain in a sensitive period which creates a vulnerability to later stress. The stressors Jim is experiencing now may trigger that vulnerability, causing him to self-medicate with nicotine.

On the other hand, a limitation of stress as a risk factor is to do with cause and effect. Many studies have shown a strong correlation between stressful experiences and addiction. But stress may not be a risk factor because the addiction might develop first. Perhaps Jim was already addicted to nicotine before he became stressed. The addiction then creates stress because of its negative effects on relationships and finances, etc. Stress and addiction are thus strongly correlated but in this case the addiction caused the stress. Therefore correlational studies – common in this area – cannot help us choose between these two competing explanations of the link.

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1. Brain neurochemistry concerns chemicals in the brain that regulate biological and psychological functioning. A chemical closely linked to nicotine addiction is the neurotransmitter dopamine. Some neurons that produce dopamine are in the ventral tegmental area (VTA) of the brain. These neurons have acetylcholine (ACh) receptors that also respond to nicotine – these receptors are called nicotinic acetylcholine receptors (nAChRs).

2. Some neurons that produce dopamine are in the ventral tegmental area (VTA) of the brain. These neurons have acetylcholine (ACh) receptors that also respond to nicotine – these receptors are called nicotinic acetylcholine receptors (nAChRs). When the neurotransmitter dopamine is released from the VTA it is transmitted along the mesolimbic pathway to the nucleus accumbens to be released in the frontal cortex. At the same time, dopamine is also transmitted along the mesocortical pathway to be released directly in the frontal cortex. The dopamine system creates a sense of reward and pleasure (e.g. reduced anxiety, mild euphoria, increased alertness) which gradually becomes associated with smoking through operant conditioning.

Once activated, nAChRs immediately shut down – they are desensitised which leads to a reduction in active neurons (downregulation). This continues as long as the person smokes regularly. But when they stop for a time (e.g. when asleep) nAChRs become functional again, so dopamine neurons resensitise and become available (upregulation). However there is no nicotine to bind with the receptors, so they are overstimulated by ACh and the smoker experiences withdrawal until they smoke another cigarette. This reactivates the dopamine system causing pleasure and reinforcing smoking behaviour.

3. One strength is that there is supporting research evidence. McEvoy *et al*. (1995) studied smoking behaviour in people with schizophrenia, some of whom were taking Haloperidol, a dopamine antagonist drug treatment for schizophrenia. Haloperidol treatment increased smoking in this sample of participants. It appears that this was a form of self-medication, an attempt to achieve the nicotine 'hit' by increasing dopamine release, supporting the central role of dopamine in nicotine neurochemistry.

One limitation of the brain neurochemistry explanation is that it does not fully explain withdrawal. The explanation argues that withdrawal depends mainly on the amount of nicotine in the blood. But Gilbert (1995) points out that these factors are not strongly correlated. Withdrawal can be mild or severe almost independently of nicotine levels in the blood. Withdrawal instead depends much more on environment and personality, e.g. people who are strongly neurotic usually experience worse symptoms than people who are emotionally stable. Therefore withdrawal is better explained by other factors without reference to nicotine neurochemistry.

4. Some neurons that produce dopamine are in the ventral tegmental area (VTA) of the brain. These neurons have acetylcholine (ACh) receptors that also respond to nicotine – these receptors are called nicotinic acetylcholine receptors (nAChRs). When the neurotransmitter dopamine is released from the VTA it is transmitted along the mesolimbic pathway to the nucleus accumbens to be released in the frontal cortex. At the same time, dopamine is also transmitted along the mesocortical pathway to be released directly in the frontal cortex. The dopamine system creates a sense of reward and pleasure (e.g. reduced anxiety, mild euphoria, increased alertness) which gradually becomes associated with smoking through operant conditioning.

Once activated, nAChRs immediately shut down – they are desensitised which leads to a reduction in active neurons (downregulation). This continues as long as the person smokes regularly. But when they stop for a time (e.g. when asleep) nAChRs become functional again, so dopamine neurons resensitise and become available (upregulation). However there is no nicotine to bind with the receptors, so they are overstimulated by ACh and the smoker experiences withdrawal until they smoke another cigarette. They experience strong cravings to smoke again and when they do the dopamine system is reactivated causing pleasure and reinforcing smoking behaviour.

One strength is that there is supporting research evidence. McEvoy *et al*. (1995) studied smoking behaviour in people with schizophrenia, some of whom were taking Haloperidol, a dopamine antagonist drug treatment for schizophrenia. Haloperidol treatment increased smoking in this sample of participants. It appears that this was a form of self-medication, an attempt to achieve the nicotine 'hit' by increasing dopamine release, supporting the central role of dopamine in nicotine neurochemistry.

However, a limitation of the explanation is that it only considers dopamine. Any such explanation of nicotine addiction is limited because there are many other neural mechanisms involved. The current picture suggests a highly complex interaction of several systems such as GABA and endogenous

opioids (endorphins). So although dopamine is central to nicotine addiction neurochemistry, we have to understand how it interacts with these other systems.

Another limitation of the brain neurochemistry explanation is that it does not fully explain withdrawal. The explanation argues that withdrawal depends mainly on the amount of nicotine in the blood. But Gilbert (1995) points out that these factors are not strongly correlated. Withdrawal can be mild or severe almost independently of nicotine levels in the blood. Withdrawal instead depends much more on environment and personality, e.g. people who are strongly neurotic usually experience worse symptoms than people who are emotionally stable. Therefore withdrawal is better explained by other factors without reference to nicotine neurochemistry.

Finally, a further strength is the development of real-life applications. Understanding nicotine neurochemistry led directly to the development of nicotine replacement therapy (NRT) in the form of patches and inhalers. Once nicotine was identified as the addictive component with effects on nAChRs, NRT products were developed to deliver a controlled dose. The nicotine acts neurochemically by binding with nAChRs, just as nicotine from cigarette smoke does – including dopamine release. This satisfies the smoker's cravings and allows them to reduce withdrawal symptoms safely by gradually reducing the dose over several weeks. Therefore a greater understanding of neurochemistry may well lead to further effective treatments for nicotine addiction in the future.

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1. Any other stimuli present at the same time as (or just before) smoking (and intake of nicotine) become associated with the pleasurable effect of smoking (i.e. classical conditioning has taken place). These stimuli become secondary reinforcers (rewarding in their own right). Certain environments (e.g. pubs) and certain people or objects (e.g. a lighter) create a sense of anticipation and pleasure and thus become secondary reinforcers. The secondary reinforcers also act as cues, because their presence produces a similar response to nicotine itself.

2. Smoking is intrinsically rewarding (not learned). It doesn't have to be learned because of the biologically determined effects of nicotine on the dopamine reward system. The pleasure created by nicotine reinforces the behaviour so the individual is more likely to smoke again. Any other stimuli present at the same time as (or just before) smoking (and intake of nicotine) become associated with the pleasurable effect of smoking (i.e. classical conditioning has taken place). These stimuli become secondary reinforcers (rewarding in their own right). Certain environments (e.g. pubs) and certain people or objects (e.g. a lighter) create a sense of anticipation and pleasure and thus become secondary reinforcers. The secondary reinforcers also act as cues, because their presence produces a similar response to nicotine itself. This is called cue reactivity and is indicated by three main elements: a self-reported desire to smoke, physiological signs of reactivity to a cue (e.g. heart rate), and objective behavioural indicators when the cue is present (e.g. how many 'draws' are taken on the cigarette).

3. A strength is that there is evidence to support cue reactivity as an explanation of smoking behaviour. Carter and Tiffany's (1999) meta-analysis looked at studies that presented smokers and non-smokers with images of smoking-related cues (e.g. lighters, ashtrays, etc.). Cravings were measured through self-reported ratings and physiological measures such as heart rate were also taken. Dependent smokers reacted most strongly to these cues (e.g. increased arousal and cravings). This suggests that dependent smokers learn secondary associations between smoking-related stimuli and the pleasurable effects of smoking, making this behaviour more likely to occur again.

Another strength is that learning theory forms the basis of treatment programmes for nicotine addiction. Aversion therapy uses counterconditioning by associating smoking with a self-administered electric shock (aversive stimulus). Smith (1988) found that 52% of clients who completed such a programme were still abstaining after one year. This suggests that treatments based on learning theory can save NHS resources, improve health and save lives.

4. One explanation for nicotine addiction is operant conditioning. If the consequence of a behaviour is rewarding to an individual, then that behaviour is more likely to occur again. Smoking can create feelings of mild euphoria, which positively reinforce the smoking behaviour. Nicotine is a powerful reinforcer because of its physiological effects on the dopamine reward system in the mesolimbic pathway. Nicotine stimulates the release of dopamine which produces the feeling of mild euphoria.

One strength of the operant conditioning explanation is support from non-human animal studies. Levin *et al*. (2010) gave rats the choice of self-administering doses of nicotine or water by licking one of two water spouts (one with nicotine). The rats licked the nicotine water spout significantly more often. This behaviour increased in frequency with every subsequent training session. The effects of nicotine positively reinforce nicotine self-administration in rats, suggesting a similar mechanism in humans.

Even so, nicotine addiction in humans is undoubtedly more complex than it is in rats. For example, cognitive factors influence learning processes which means humans think about reinforcers in a way that rats do not. There are also strong subjective desires/cravings in human cue reactivity that are hard to understand in rats. Therefore, animal studies can help us understand learning processes in addiction but findings must be treated cautiously because other factors are involved in human addiction which make it more complex.

Another explanation for nicotine addiction is cue reactivity through classical conditioning. Any other stimuli present at the same time as (or just before) smoking (and intake of nicotine) become associated with the pleasurable effect of smoking (i.e. classical conditioning has taken place). These stimuli become secondary reinforcers (rewarding in their own right). Certain environments (e.g. pubs) and certain people or objects (e.g. a lighter) create a sense of anticipation and pleasure and thus become secondary reinforcers. Even the seemingly harsh feeling of smoke hitting the back of the throat can become a secondary reinforcer because it is associated with the pleasurable impact of nicotine.

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A further strength is the real-life application of learning theory. Aversion therapy works on the basis of counterconditioning nicotine addiction by associating the pleasurable effects of smoking with an aversive stimulus such as a painful electric shock. Smith (1988) found that 52% of participants who gave themselves electric shocks whenever they engaged in smoking-related behaviours were still abstaining after one year. Such effective applications of learning theory have measurable and significant practical benefits in terms of reducing NHS spending and improving health.

However, studies of the effectiveness of aversion therapy are sometimes methodologically weak. The above study is a case in point because it lacked a placebo control group. This undermines the

validity of any conclusions – we cannot tell that 52% of participants abstaining after one year is a good outcome when there is nothing to compare the figure with. Also, higher-quality studies suggest that any benefits of aversion therapy are relatively short-lived compared with other therapies (Hajek and Stead 2001). Therefore learning theory may not be a useful basis for an effective treatment of nicotine addiction after all.

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1. A partial reinforcement schedule leads to more persistent behaviour change. When only some bets are rewarded there is an unpredictability about which gambles will pay off, which is enough to maintain the gambling even when most gambles are not rewarded. A variable reinforcement schedule is a partial reinforcement schedule where the intervals between rewards vary. This kind of reinforcement schedule is highly unpredictable. For example, a slot machine might pay out after an average of 25 spins, but not on every 25th spin. The first payout might be on the 11th spin, then the 21st, then the 38th, etc.

2. Positive reinforcement in gambling comes from a direct gain (e.g. winning money), and from the 'buzz' that accompanies a gamble (which is exciting). Negative reinforcement occurs because gambling can offer a distraction from aversive stimuli (e.g. the anxieties of everyday life). Skinner's research with rats found that continuous reinforcement schedules do not lead to persistent behaviour change. A partial reinforcement schedule leads to more persistent behaviour change. When only some bets are rewarded there is an unpredictability about which gambles will pay off, which is enough to maintain the gambling even when most gambles are not rewarded. A variable reinforcement schedule is a partial reinforcement schedule where the intervals between rewards vary. This kind of reinforcement schedule is highly unpredictable. Whilst it takes longer for learning to be established if the reinforcement schedule is variable, once it is established it is more resistant to extinction. The gambler learns that they will not win with every gamble, but they will eventually win if they persist (and then the gambling is reinforced). This explains why some people continue to gamble despite big losses.

3. One explanation for gambling is learning theory. One strength of the learning theory explanation is research support. Dickerson (1979) found high-frequency (dependent) gamblers in natural settings were more likely than low-frequency gamblers to place bets in the last two minutes before a race. These gamblers may delay betting to prolong the rewarding excitement of the 'build up' (e.g. the tension they get from the radio commentary heard in the betting shop). This is evidence for the role of positive reinforcement on gambling behaviour in frequent gamblers in a more 'real-life' setting than a psychology lab.

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Cue reactivity explains how associated stimuli can trigger gambling. In the course of their gambling, an individual will experience many secondary reinforcers – things they associate with the exciting arousal experienced through gambling. For example, the features referred to in the question such as the noises and flashing lights from the slot machine can all cue the arousal that the gambler craves. These low-level reminders are difficult to avoid. These cues can both maintain gambling and cause its reinstatement after a period of abstinence.

One strength of the learning theory explanation is research support. Dickerson (1979) found high-frequency (dependent) gamblers in natural settings were more likely than low-frequency gamblers to place bets in the last two minutes before a race. These gamblers may delay betting to prolong the rewarding excitement of the 'build up' (e.g. the tension they get from the radio commentary heard in the betting shop). This is evidence for the role of positive reinforcement on gambling behaviour in frequent gamblers in a more 'real-life' setting than a psychology lab.

However we should note that this study did have some methodological problems. For example, only one person observed betting behaviour in the shops. This meant there was no way to check the reliability of the observations, which would normally have been done by calculating a correlation between two observers' observations (inter-observer reliability). This means that observer bias may not have been eliminated so the findings of the study might not be valid.

Learning theory attempts to explain the whole cycle of addiction, from initiation through maintenance and cessation to relapse. But a limitation is that some psychologists believe that parts of the cycle are poorly explained by learning theory. For example, people who dabble with gambling experience the same reinforcements as people who become addicted. Most people who try gambling never become addicted even though they observe others enjoying it, experience rewarding excitement and are distracted from everyday stress. So there must be other factors involved in addiction. Perhaps a genetic vulnerability or ways of thinking about gambling may explain why the addiction cycle begins for some people but not for others. Therefore, learning theory can explain some aspects of the addiction cycle, but others may be better explained by biological and cognitive theories.

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1. The cause of gambling addiction lies in the fact that addicts hold beliefs about gambling that are irrational (i.e. cognitive biases). Such cognitions may involve attention and/or memory processes – addiction occurs and is maintained due to the selective attention to and memory of gambling-related information. One example is of perceived skill and judgement – gambling addicts have an illusion of control and overestimate their skill against chance (e.g. believing themselves especially skilled at choosing lottery numbers).

2. We all have expectations about the future benefit and costs of our behaviour. If people expect the benefits of gambling to outweigh the costs, then addiction becomes more likely. This sounds like a conscious decision but it is not. This is because memory and attention processes do not operate in a rational and logical manner. The cause of gambling addiction lies in the fact that addicts hold beliefs about gambling that are irrational (i.e. cognitive biases). Such cognitions may involve attention and/or memory processes – addiction occurs and is maintained due to the selective attention to and memory of gambling-related information. An example of a cognitive bias concerns perceived skill and judgement. Addicted gamblers have an illusion of control and overestimate their skill against chance (e.g. believing themselves especially skilled at choosing lottery numbers).

3. In terms of the cognitive explanation, we all have expectations about the future benefit and costs of our behaviour. If people expect the benefits of gambling to outweigh the costs, then addiction becomes more likely. This sounds like a conscious decision but it is not. This is because memory and attention processes do not operate in a rational and logical manner. The cause of gambling addiction lies in the fact that addicts hold beliefs about gambling that are irrational (i.e. cognitive biases). Such cognitions may involve attention and/or memory processes – addiction occurs and is maintained due to the selective attention to and memory of gambling-related information. An example of a cognitive bias concerns perceived skill and judgement. Addicted gamblers have an illusion of control and overestimate their skill against chance (e.g. believing themselves especially skilled at choosing lottery numbers).

There is also a learning explanation. Cue reactivity explains how associated stimuli can trigger gambling. In the course of their gambling, an individual will experience many secondary reinforcers – things they associate with the exciting arousal experienced through gambling. For example, the things referred to in the question such as the noises and flashing lights from the slot machine can all cue the arousal that the gambler craves. These low-level reminders are difficult to avoid. These cues can both maintain gambling and cause its reinstatement after a period of abstinence.

4. According to cognitive theory, we all have expectations about the future benefit and costs of our behaviour. If people expect the benefits of gambling to outweigh the costs, then addiction becomes more likely. But memory and attention processes do not operate in a rational and logical manner. The cause of gambling addiction lies in the fact that addicts hold beliefs about gambling that are irrational (i.e. cognitive biases). Such cognitions may involve attention and/or memory processes – addiction occurs and is maintained due to the selective attention to and memory of gambling-related information.

Rickwood *et al*. (2000) categorised four different categories of cognitive bias. First, skill and judgement – gambling addicts have an illusion of control and overestimate their skill against chance. Second, personal traits/ritual behaviours – addicts believe they are especially lucky or engage in superstitious behaviour. Third, selective recall – gamblers remember their wins but ignore/forget their losses. And fourth, faulty perceptions – gamblers have distorted views of chance (e.g. believing that a losing streak cannot last).

One strength is the evidence supporting the cognitive theory. Michalczuk *et al*. (2011) compared 30 addicted gamblers with a non-gambling control group. The addicted gamblers had significantly higher levels of gambling-related cognitive biases. They were also more impulsive and were more likely to prefer immediate rewards, even if the rewards were smaller than those they could gain if they waited. These findings support the view that there is a strong cognitive component to gambling addiction.

However this study does highlight one limitation of cognitive research into gambling addiction. Cognitive biases were measure using the gambling-related cognitions scale which gives a score covering five types of bias (illusion of control, etc.). A gambler's high score could mean that they have frequent biased cognitions (as the study suggests). But it could equally mean that they use their beliefs to justify their behaviour and their thinking isn't biased at all. Therefore the findings of this study may not truly reflect a gambler's actual beliefs about gambling.

Another strength is that cognitive theory highlights how cognitive biases appear to be automatic in addicted gamblers. McCusker and Gettings (1997) asked participants to complete a modified Stroop task. Participants had to pay attention to ink colour while ignoring word meanings. Gamblers took longer to do this compared to a control group when gambling words were shown. This suggests gamblers have an automatic cognitive bias to pay attention to such information. This supports the

view of the cognitive explanation that many cognitive biases influence addiction and operate without us even being aware we have them. This is very difficult for a purely learning-based theory to explain.

Another limitation is that cognitive biases are only proximate explanations of gambling behaviour. In other words, cognitive theory describes the addicted gambler's biased beliefs about change but does not explain what causes these beliefs. To understand this, we have to go back further in the chain of causation to find the ultimate explanation. For example, it may be that gamblers have learned to think in a biased way, which suggests that learning theory may be a more valid explanation of the true causes of gambling addiction.

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1. One strength of drug therapy is research evidence that it is effective. Hartmann-Boyce *et al*. (2018) did a meta-analysis of high-quality studies into NRT and concluded that all forms of NRT were more effective in helping smokers quit than placebo and no therapy at all. Using NRT increased the rate of quitting by up to 60%, without clients becoming dependent on the nicotine in the NRT product. Therefore NRT is an effective drug therapy which may save lives, improve health and reduce costs to the NHS.

However, a limitation of this study is that the researchers only included studies that had been published. This means there is a risk of publication bias. Published studies are more likely to show 'positive' results. i.e. supporting the effectiveness of NRT. Studies with non-significant results or that show no effect are not usually published because a negative effect is not interesting. The researchers did write to manufacturers of NRT products to track down unpublished studies but the response was poor. This means that NRT may not be as effective as the findings of this meta-analysis suggest.

2. One drug therapy is nicotine replacement therapy (NRT) which uses gum, inhalers or patches to give the smoker a clean, controlled dose of nicotine which operates neurochemically just like nicotine from cigarettes. Nicotine is an agonist which activates nAChRs in the mesolimbic pathway of the brain and stimulates dopamine release in the nucleus accumbens into the frontal cortex. The amount of nicotine can be reduced by using smaller and smaller patches which means the withdrawal syndrome can be managed over a period of several weeks, reducing the unpleasantness of the symptoms.

A promising candidate for drug treatment of gambling addiction is the opioid antagonist naltrexone (normally used to treat heroin addiction). Gambling may tap into the same dopamine reward system as heroin, nicotine and other drugs. Opioid antagonists enhance the release of the neurotransmitter GABA in the mesolimbic pathway. Increased GABA activity reduces the release of dopamine in the nucleus accumbens (and ultimately the frontal cortex). This has been linked with subsequent reductions in gambling behaviour.

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4. There are three main types of drug therapy used to treat addiction. Aversive drugs produce unpleasant consequences such as vomiting when paired with a substance of addiction such as alcohol. A client associates drinking alcohol with unpleasant outcomes rather than with enjoyment (classical conditioning). Agonists are drug substitutes, providing a similar effect to the addictive substance. They stabilise the individual because they are used to control the withdrawal syndrome. Antagonists block neuron receptor sites so that the substance of dependence cannot have its usual effects, especially the feeling of euphoria.

One agonist drug therapy is nicotine replacement therapy (NRT) which uses gum, inhalers or patches to give the smoker a clean, controlled dose of nicotine which operates neurochemically just like nicotine from cigarettes. Nicotine is an agonist which activates nAChRs in the mesolimbic pathway of the brain and stimulates dopamine release in the nucleus accumbens into the frontal cortex. The amount of nicotine can be reduced by using smaller and smaller patches which means the withdrawal syndrome can be managed over a period of several weeks, reducing the unpleasantness of the symptoms.

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A limitation of all drug therapies is side effects. Common ones side effects of NRT are sleep disturbances, dizziness and headaches. In relation to gambling, the dose of naltrexone required leads to side effects worse than would be the case when using it to treat opioid addiction. Such side effects mean there is a risk that the individual will discontinue the therapy, especially when they have also lost the pleasurable effects of the addiction. The risk of side effects should be carefully weighed up against the benefits of the drug therapy and psychological therapies such as covert sensitisation.

Another strength is the removal of addiction stigma. Drug therapy encourages a growing perception that drug addiction is a medical problem. Research is rapidly revealing the neurochemical and genetic basis of addiction. This is changing the view that addiction is a form of psychological or moral failure. Addiction therefore becomes less stigmatised as more people accept that it may not be the

addicted person's 'fault'. This is a strength because in turn it could encourage more addicts to seek treatment.

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1. The main difference is that aversion therapy is experienced in vivo (the unpleasant stimulus is experienced) and covert sensitisation is in vitro (the unpleasant stimulus is imagined rather than actually experienced). Traditional aversion therapy is actually experienced by the client in the form of an unpleasant consequence associated with the addictive drug or behaviour through classical conditioning. As an addiction can develop through repeated associations between a drug and the pleasurable state of arousal caused by it, it follows that the addiction can be reduced by associating the drug with an unpleasant state (counterconditioning). In covert sensitisation, the client imagines the unpleasant consequences rather than experiencing them in reality.

2. Aversion therapy is a behavioural intervention based on classical conditioning. According to learning theory, an addiction can develop through repeated associations between a drug and the pleasurable state of arousal caused by it. It follows that the addiction can be reduced by associating the drug with an unpleasant state (counterconditioning). Aversion therapy has been used in treating alcoholism. The client is given a drug such as disulfiram (UCS) which causes a person drinking alcohol to experience an instant hangover with severe nausea and vomiting (UCR). The client learns to associate the alcohol (NS and then CS) with the unpleasant symptoms (CR) and the fear of the symptoms can prevent the client from drinking. Electric shocks have been used in place of drugs for behavioural addictions such as gambling. The gambler selects phrases that relate to their gambling behaviour and others that do not (e.g. 'went straight home'). They read out each phrase and whenever a gambling-related phrase is read (NS and then CS) they receive a two-second electric shock which is painful (UCR and then CR) but not too distressing.

3. One limitation is that aversion studies suffer from methodological problems. Hajek and Stead (2001) reviewed 25 studies of aversion therapy for nicotine addiction, claiming it was impossible to judge its effectiveness because the studies had glaring methodological problems. In most studies 'blind' procedures were not used, so the researchers who evaluated the outcomes of the studies knew which participants had received therapy or placebo. Such inbuilt biases generally make therapy appear more effective than it actually is, which challenges the validity of the findings.

Another limitation of aversion therapy is that it lacks long-term effectiveness. Fuller *et al*. (1986) gave disulfiram to a group of people addicted to alcohol every day for one year. These participants and a placebo control group had weekly counselling sessions for six months as well. After one year, there was no difference in total abstinence from drinking between the two groups. This suggests that traditional aversion therapy is no more effective for alcohol addiction than placebo, so it may be that counselling had the greater impact.

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Traditional aversion therapy has been largely superseded by covert sensitisation. This is a type of aversion therapy, but in vitro rather than in vivo, in that the unpleasant stimulus is imagined rather than actually experienced. People with nicotine addiction are first encouraged to relax, then to conjure up a vivid image of themselves smoking a cigarette (CS), followed by the most unpleasant consequences (CR) such as vomiting (including graphic details of smells, sights, etc.). The association formed (classical conditioning) should reduce smoking behaviour.

A strength of covert sensitisation is research support. McConaghy *et al*. (1983) found that after one year, gambling addicts who had received covert sensitisation were much more likely to have reduced their gambling activity than those who received aversion therapy. The participants also reported experiencing fewer and less intense gambling cravings than the aversion-treated participants. This is one of many studies suggesting covert sensitisation is a highly promising treatment for addiction to alcohol, nicotine and gambling.

A limitation of covert sensitisation is that, as a behavioural intervention, it only suppresses addiction and does not cure it. People undergoing covert sensitisation may appear to benefit but the issues that caused the addiction remain. The risk is that the addiction returns later in a different form, e.g. the person might gamble rather than take drugs because it provides the same rewarding feelings. Some symptoms of an addiction might disappear, but others could get worse or new ones appear (called 'symptom substitution'). The reasons for this are not addressed in covert sensitisation.

Both interventions can be evaluated in terms of ethical issues. This is a limitation of traditional aversion therapy. Inflicting nausea and pain can be seen as unethical and clients could lose their dignity by vomiting in social situations. However, it is a strength of covert sensitisation in that it generally avoids ethical criticism. It does not induce vomiting or other self-shaming behaviours, allowing individuals to retain their dignity and self-esteem. This means that aversion therapy is questionable because the ethical costs are high but the benefits in terms of effectiveness are low. The relationship is the other way round for covert sensitisation, making it the preferred intervention.

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1. Cognitive behaviour therapy (CBT) has two key elements: cognitive – identify, tackle and replace cognitive distortions that underlie the addiction (functional analysis), and behavioural – skills-training helps a client develop coping behaviours to avoid the high-risk situations that trigger the addiction-related behaviour. This is in contrast to aversion therapy which just deals with the learned behavioural aspects of addiction and not the cognitive aspects.

2. Cognitive behaviour therapy (CBT) aims to tackle distorted thinking and develop coping behaviours. CBT has two key elements. The cognitive element aims to identify, tackle and replace cognitive biases that underlie the addiction (functional analysis). The behavioural element includes skills-training, which helps the client develop coping behaviours to avoid the high-risk situations that trigger the addiction-related behaviour.

CBT starts with the client and therapist together identifying the high-risk situations that lead to the client's substance abuse or gambling. The therapist reflects on what the client is thinking before, during and after such a situation. The therapist's role in the relationship is to challenge the client's cognitive biases. Cognitive restructuring confronts and challenges faulty beliefs. For example, a gambler may hold faulty beliefs about probability, randomness and control in gambling. In the initial education phase, the therapist may give the client information about how to challenge these faulty beliefs.

People seeking treatment for addiction may have a huge range of problems but only one way of dealing with them – their addiction. CBT helps to replace this strategy with more constructive ones by developing new skills. These include specific skills such as anger management or assertiveness training but also broader social skills to help clients cope with encountering the drug of addiction in social situations.

3. One strength of CBT is research support. Petry *et al*. (2006) found that gamblers assigned to a treatment condition (Gamblers Anonymous meetings + CBT) were gambling less than a control group (GA meetings only) 12 months later. An important feature of this study is that the participants were randomly allocated to the CBT group or the control group, and there were no significant differences in the extent of their gambling at the start. Therefore, these findings are strong evidence that CBT is effective in treating gambling addiction, from a methodologically sound study.

One limitation, however, is a lack of long-term gains. Cowlishaw *et al*. (2012) found that CBT has definite beneficial effects for up to three months after treatment. However, after 9–12 months, there were no significant differences between CBT and control groups. In addition, the researchers also concluded that the studies they reviewed were of such poor methodological quality that they probably overestimated the efficacy of treatment with CBT. Therefore, CBT may be effective in reducing gambling behaviour, but the 'durability of therapeutic gain' is unclear.

Another strength is that CBT is especially useful in preventing relapse. Relapse is not an unusual event in addiction recovery. Addiction is really a cycle of cessation and relapse, so a therapy that can prevent relapse is very beneficial. CBT presents a very realistic view of recovery and has built into it the probability of relapse. Relapse is therefore not seen as a failure but as an opportunity for clients to engage in further cognitive restructuring and learning. Relapse is inevitable but also manageable as long as the client's psychological and social functioning improves. Therefore, as long as clients stick with CBT, it can help them to recover quickly from relapse by maintaining a stable lifestyle.

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CBT starts with the client and therapist together identifying the high-risk situations that lead to the client's substance abuse or gambling. The therapist reflects on what the client is thinking before, during and after such a situation. The therapist's role in the relationship is to challenge the client's

cognitive biases. This process of functional analysis continues throughout the treatment, not just at the beginning of the therapy.

One strength of CBT is research support. Petry *et al*. (2006) found that gamblers assigned to a treatment condition (Gamblers Anonymous meetings + CBT) were gambling less than a control group (GA meetings only) 12 months later. An important feature of this study is that the participants were randomly allocated to the CBT group or the control group, and there were no significant differences in the extent of their gambling at the start. Therefore, these findings are strong evidence that CBT is effective in treating gambling addiction, from a methodologically sound study.

One limitation, however, is a lack of long-term gains. Cowlishaw *et al*. (2012) found that CBT has definite beneficial effects for up to three months after treatment. However, after 9–12 months, there were no significant differences between CBT and control groups. In addition, the researchers also concluded that the studies they reviewed were of such poor methodological quality that they probably overestimated the efficacy of treatment with CBT. Therefore, CBT may be effective in reducing gambling behaviour, but the 'durability of therapeutic gain' is unclear.

Aversion therapy is a behavioural intervention based on classical conditioning. According to learning theory, an addiction can develop through repeated associations between a drug and the pleasurable state of arousal caused by it. It follows that the addiction can be reduced by associating the drug with an unpleasant state (counterconditioning). Aversion therapy has been used in treating alcoholism. The client is given a drug such as disulfiram (UCS) which causes a person drinking alcohol to experience an instant hangover with severe nausea and vomiting (UCR). The client learns to associate the alcohol (NS and then CS) with the unpleasant symptoms (CR) and the fear of the symptoms can prevent the client from drinking.

One limitation is that aversion studies suffer from methodological problems. Hajek and Stead (2001) reviewed 25 studies of aversion therapy for nicotine addiction, claiming it was impossible to judge its effectiveness because the studies had glaring methodological problems. In most studies 'blind' procedures were not used, so the researchers who evaluated the outcomes of the studies knew which participants had received therapy or placebo. Such inbuilt biases generally make therapy appear more effective than it actually is, which challenges the validity of the findings.

Another limitation of aversion therapy is that it lacks long-term effectiveness. Fuller *et al*. (1986) gave disulfiram to a group of people addicted to alcohol every day for one year. These participants and a placebo control group had weekly counselling sessions for six months as well. After one year, there was no difference in total abstinence from drinking between the two groups. This suggests that traditional aversion therapy is no more effective for alcohol addiction than placebo, so it may be that counselling had the greater impact.

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1. According to Ajzen's (1985, 1991) theory of planned behaviour (TPB), changes in addiction-related behaviour can be predicted from our intentions to change, which in turn are influenced by three factors.

'Personal attitudes' refers to the entire collection of attitudes that the addicted person holds about their addiction. Their overall attitude is formed from weighing up the balance of favourable and unfavourable attitudes. For example, 'it gives me a thrill' and 'it's an escape' versus 'I lose more money than I win' and 'it makes me feel anxious'.

Subjective norms are the addicted person's beliefs about whether key people in their life would approve or disapprove of their addictive behaviour. If the person concludes that others are unhappy about their gambling, for instance, this would make them less likely to plan/intend to gamble. The most influential aspect of subjective norms is the addicted person's perception. For example, parents may express favourable attitudes towards something in general (e.g. getting drunk) but disapprove of their own children doing it. Nevertheless, the perception is that they approve.

Perceived behavioural control is about how much control we think we have over our behaviour. This is called self-efficacy. For example, does the addicted gambler believe they are capable of giving up gambling? This may be related to their perception of resources available to them (e.g. support, time, skill, determination).

2. The theory of planned behaviour could be used to change addictive behaviour by changing the addicted person's subjective norms. For instance, adolescents often overestimate how much their peers are drinking, so providing messages such as, 'Other people are not drinking as much as you think' could help change subjective norms as long as the source is credible.

An intervention could also change the person's perceived behavioural control by increasing their self-efficacy. This could involve encouraging them to adopt an optimistic outlook and develop confidence in their ability not to gamble, for instance. Support from other people could also develop perceived control.

3. One strength is that there is some research support. Hagger *et al*. (2011) found that the TPB's three factors all predicted an intention to limit drinking. Intentions were also found to influence actual alcohol consumption after one and three months. These findings support predictions derived from the theory which suggests it is valid. However, the study failed to predict some alcohol-related behaviours (e.g. binge-drinking), so the success of the TPB depends on the behaviour being measured. This suggests that even supportive research indicates that the predictive validity of the TPB is limited.

4. According to Ajzen's (1985, 1991) theory of planned behaviour (TPB), changes in addiction-related behaviour can be predicted from our intentions to change, which in turn are influenced by three factors.

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Simon's intention to change would be key to whether he is able to stop smoking. Simon must weigh up the pros and cons of smoking and this will determine whether he has a favourable or unfavourable attitude towards it. For example, does the thrill or buzz he gets from smoking outweigh his fear of the negative effects on his health? Also, what are Simon's perceptions of the social norms of smoking? Do others around him think it is a disgusting habit? Do they think less of Simon for continuing to smoke? Finally, what is Simon's perceived behavioural control? Does he see himself as able to give up smoking or think he does not have sufficient willpower?

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One limitation is that the TPB does not explain the intention-behaviour gap. Miller and Howell (2005) found strong support for the element of TPB that predicts gambling intentions from attitudes, norms and perceived behavioural control in underage teenagers. However, the model did not predict the occurrence of actual gambling behaviour. Psychologists now question whether TPB is an effective model of behaviour change. If the theory can't predict behaviour change, it is difficult to create drug-related interventions that bridge the gap between intention to reduce the behaviours and the actual behaviours themselves.

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1. Ajzen's (1985, 1991) theory of planned behaviour (TPB) suggests we change behaviours in a rational way, evaluating positive and negative consequences. Addiction-related behaviour can be predicted from a person's intentions. These intentions arise from three key influences: first, personal attitudes towards the addiction, second, subjective norms (i.e. the perception of what others think) and third, perceived behavioural control.

Prochaska and DiClemente (1983) suggest a six-stage model in which overcoming addiction is a cyclical process. The model is based on two insights about behavioural change: first, people differ in how ready they are to change, and second, the usefulness of a treatment intervention depends on the stage the person has reached.

2. Prochaska and DiClemente (1983) suggest a six-stage model in which overcoming addiction is a cyclical process.

In Stage 1 Precontemplation, the person is not thinking about changing their addiction-related behaviour within the next six months either because of denial or demotivation. Intervention should focus on helping the person consider the need for change.

In Stage 2 Contemplation, the person is now thinking about making a change in the next six months. Intervention should focus on helping them see that the pros outweigh the cons and help them reach a decision to change.

In Stage 3 Preparation, the individual believes that the benefits are greater than the costs and has decided to make a change within the next month. But because they have not decided how to make

the change, intervention should give individuals support in constructing a plan (e.g. to ring a helpline).

In Stage 4 Action, the person has done something to change their addictive behaviour in the last six months (e.g. they have removed alcohol from the house). Intervention should focus on coping skills needed to quit.

In Stage 5 Maintenance, the person has maintained some behavioural change (e.g. stopped gambling) for more than six months. Intervention should focus on relapse prevention.

In Stage 6 Termination, abstinence becomes automatic and the person no longer returns to addictive behaviours to cope with anxiety, stress, loneliness, etc. Intervention is not required.

3. A strength is that the model recognises the true dynamic nature of addictive behaviour. Traditional theories have considered recovery from addiction as an 'all-or-nothing' event. However, the six-stage model stresses a dynamic and continuing process and the importance of time. This is why the model proposes that behavioural change occurs through six stages of varying duration for each person and that these stages may not be linear. Therefore, the six-stage model provides a realistic view of the complex and active nature of addiction and recovery.

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person and that these stages may not be linear. Therefore, the six-stage model provides a realistic view of the complex and active nature of addiction and recovery.

Another strength of the model is the positive attitude to relapse. DiClemente *et al*. (2004) suggest that 'relapse is the rule rather than the exception'. The model does not view relapse as a failure, but as an inevitable part of the dynamic process of behaviour change. The model takes relapse seriously and does not underestimate its potential to blow change off course. Changes to behaviour require several attempts to reach the maintenance or termination stages. This means the model has face validity with clients and is more acceptable because they can see it is realistic about relapse.

A limitation is contradictory research that challenges the model. Taylor *et al*. (2006) carried out a major review of available evidence for NICE, which included several meta-analyses. They concluded that the model is no more effective than any other stage model in changing nicotine addiction. They also stated that there is no valid evidence for the existence of such clearly-defined stages as those in the model. This suggests that despite optimistic claims made for the model by some, the overall research picture is negative.

Considering this further, a related limitation is the arbitrary nature of the stages. It is impossible in real addictions to distinguish one stage from another. Kraft *et al*. (1999) claim that the six stages of the model can be reduced to just two useful ones – precontemplation, plus all the others grouped together. This is a real problem because each stage is supposed to be linked to an intervention, but this lack of validity suggests this is not a useful approach. Therefore the stage model has little usefulness either for understanding change in addictive behaviour over time or for recommending treatments.