Some suggested answers to the ‘Can you?’ questions in the *Year 1 and AS Complete Companion (AQA)* book are given here.

Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Chapter 1

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1. Conformity is a form of social influence that results from exposure to the majority position and leads to compliance with that position. It is the tendency for people to adopt the behaviour, attitudes and values of other members of a reference group. For example, a person who alters their behaviour merely to fit in with a peer group is said to be conforming.

2. Compliance occurs when an individual accepts influence because they hope to achieve a favourable reaction from those around them. An attitude or behaviour is adopted not because of its content, but because of the rewards or approval associated with its adoption. Compliance does not result in any change in the person’s underlying attitude.

   Internalisation occurs when an individual accepts influence from the majority because of an acceptance of their views. Examination of the majority’s position may convince them that they (the individual) are wrong, and the majority is right. This can lead to an acceptance of the majority position both publicly and privately.

   Identification occurs when an individual adopts an attitude or behaviour because they want to be associated with a group. By adopting the group’s attitudes and behaviours, they feel more a part of it. Although the individual accepts these as right and true, their reason for accepting them is simply to be accepted as a member of the group.

3. An example of compliance is where a boy joins in with a group’s delinquent behaviour because he does not want to be ridiculed for not behaving in the same way. An example of internalisation is where a boy joins in with a group’s delinquent behaviour because he accepts the belief that they need to hit back because of police victimisation. An example of identification is where a boy joins in with a group’s delinquent behaviour because he wants to be seen as a member of a tough group from a tough estate.

4. Human beings are a social species, and therefore have a fundamental need for social companionship and a fear of rejection. They are motivated to gain approval and acceptance and avoid disapproval and censure from their reference group. For this type of influence to occur, the individual must believe they are under surveillance by the group. As a result, they conform in public but may not change their attitudes when in private (i.e. compliance only).

5. Human beings have a need to feel confident that their perceptions and beliefs are correct. Therefore, they may sometimes need to rely on the opinions of their reference group. This is more likely when the situation is ambiguous, or when they believe others have more knowledge
about the situation than they have. As a result, they may not just comply in public, but may also change their underlying attitudes in line with the group position (i.e. internalisation).

6. The normative social influence explanation of conformity is based on the belief that human beings are a social species, and therefore have a fundamental need for social companionship and a fear of rejection. As a result, they are motivated to gain approval and acceptance and avoid disapproval and censure from their reference group. For this type of influence to occur, the individual must believe they are under surveillance by the group. As a result, they conform in public but may not change their attitudes when in private (i.e. compliance only).

The informational social influence explanation of conformity is based on the belief that human beings have a need to feel confident that their perceptions and beliefs are correct. Therefore, they may sometimes need to rely on the opinions of their reference group. This is more likely when the situation is ambiguous, or when they believe others have more knowledge about the situation than they have. As a result, they may not just comply in public, but may also change their underlying attitudes in line with the group position (i.e. internalisation).

Research has supported the influence of normative beliefs on behaviour. For example, normative influence has been used to manipulate people to engage in energy conservation behaviour. Schultz et al. (2008), found hotel guests reduced their towel use when told that 75% of other guests reused their towels daily. This shows that people shape their behaviour out of a desire to fit in with a reference group.

Research has supported the role of informational influence in shaping political opinion. For example, Fein et al. (2007) showed how judgements of candidate performance in US presidential debates could be influenced by knowledge of others’ reactions. Being shown the reactions of other participants on screen during the debate produced large shifts in judgements of the candidates’ performance, as predicted by this explanation.

It is difficult to know when a person is subject to informational rather than normative influence. It is assumed that agreeing with the majority both in public and in private must indicate informational influence. However, it is also possible that the initial reason for complying was to fit in with the group (i.e. normative influence) and then through self-perception of their own behaviour, the person accepts the position as their own.

Extra AO3 material for 16-mark A Level answers

The impact of normative social influence as a causal factor on behaviour tends to be underestimated. Nolan et al. (2008) found that people believed that their neighbours’ behaviour had the least impact on their energy conservation behaviour whereas results showed it had the greatest impact. This shows that people rely on beliefs about what should motivate their behaviour and so under-detect the impact of normative influence.

Informational influence is more likely on some tasks than others. For some tasks, there are clear objective physical criteria available on which to base judgements (e.g. population of a city), whereas for others, there are no such objective physical criteria (e.g. how ‘fun’ a city is). Majorities should exert more informational influence on the latter type of judgement and research tends to support this (e.g. Laughlin, 1999).

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1. Asch tested 123 male US undergraduates, who were seated around a table with other ‘participants’ and shown three lines of different lengths. Their task was to say which of the three lines was the same length as a standard line. The participant always answered second to last, with the other ‘participants’ actually being confederates who were instructed to all give the same wrong answer on 12 of the 18 trials.

On the 12 ‘critical’ trials, participants conformed to the incorrect judgements given by the confederates approximately one-third of the time. There were individual differences in conformity rates, with one-quarter of the participants never conforming at all, and one in 20 conforming on all 12 critical trials. In a control condition, where participants made their judgements without the distraction of confederates giving wrong answers, they made mistakes only 1% of the time.
2. Asch found there was very little conformity when the majority consisted of just one or two confederates. When the number of confederates increased to three, the proportion of conforming responses also increased, up to about 30%. Further increases in the size of the majority did not significantly increase this level of conformity. Campbell and Fairey (1989) found that group size has a different effect depending on the type of judgement being made. For example, they found that where there is no objectively correct answer and the individual is concerned about fitting in, then the larger the majority size, the greater the conformity.

3. When the unanimity of the group was broken in Asch’s study, conformity levels decreased significantly. For example, if the participant was given the support of a confederate who gave the right answers throughout, conformity levels dropped from 33% to 5.5%. In another condition, where a confederate gave an answer that was a different wrong answer to the one given by the majority, conformity levels also decreased to 9%. Asch believed that it was breaking the group’s unanimous position that was the major factor in conformity reduction.

4. When Asch made the task more difficult by making the differences between the line lengths much smaller, the level of conformity increased. Lucas et al. (2006) found that the influence of task difficulty was moderated by the individual’s confidence in their own abilities (i.e. their self-efficacy). They found that high self-efficacy participants remained more independent in their judgements than low self-efficacy participants, even under conditions of high task difficulty. Asch believed that situational differences (task difficulty) and individual differences (self-efficacy) are both important in determining conformity.

5. Asch (1956) found that on 12 ‘critical’ trials, where the majority gave the same wrong answer on a line-matching task, participants conformed to these incorrect judgements approximately one-third of the time. There were individual differences in conformity rates, with one-quarter of the participants never conforming at all, and one in 20 conforming on all 12 critical trials.

Asch found that the level of conformity varied with group size. There was very little conformity when the majority consisted of just one or two confederates, but when the number of confederates increased to three, the proportion of conforming responses also increased, up to about 30%. Further increases in the size of the majority did not significantly increase this level of conformity.

Asch believed that it was breaking the group’s unanimous position that was the major factor in conformity reduction. If a confederate gave the right answers throughout, conformity levels dropped from 33% to 5.5%. In another condition, where a confederate gave an answer that was a different wrong answer to the one given by the majority, conformity levels also decreased to 9%.

Perrin and Spencer (1980) claim Asch’s findings are unique because of the period of US history (McCarthyism) in which the study took place. They repeated Asch’s study in the UK, but found close to zero conformity. However, in a subsequent study of youths on probation, when the perceived costs of not conforming were high (as would have been the case during McCarthyism), they obtained similar levels of conformity to Asch.

Bond (2005) suggests a limitation of research in conformity is the limited range of majority sizes. Bond points out that few studies have used a majority size greater than three, and no studies other than Asch have used a majority size greater than nine. This, suggests Bond, means that we know very little about the effect of larger majority sizes on conformity levels.

Although Asch’s study is cited as a demonstration of conformity, only one-third of the trials produced a conforming response. On two-thirds of the trials, participants stuck to their original judgement despite being faced with a unanimous majority that gave a different answer. Asch believed that, rather than showing human beings to be overly conformist, his study demonstrated their tendency to show independent behaviour.
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A problem in Asch’s study is that the confederates may not have acted convincingly when giving the wrong answer. Mori and Arai (2010) overcame this problem by having participants wear glasses with polarising filters, so that each participant viewed the same stimuli but one participant saw them differently. They found that, for female participants, the results matched those of Asch, suggesting that the confederates in the original study had acted convincingly.

Research suggests there are cultural differences in conformity, so we might expect different results depending on where a study took place. Smith et al. (2006) found the average conformity rate for studies carried out in collectivist cultures was much higher (37%) than for individualist cultures (25%). Markus and Kitayama (1991) suggest that a higher level of conformity arises in collectivist cultures because it is viewed more favourably.

Page 23 No. 1.3

1. Zimbardo set up a mock prison in the basement of the psychology department at Stanford University in California. Twenty-four psychologically and physically healthy male students were randomly assigned to play the role of either prisoners or guards, and given appropriate uniform to wear. Their behaviour in the simulated prison was planned to be observed for two weeks, with Zimbardo himself playing the role of Prison Superintendent.

Zimbardo observed that over the first few days of the study the guards grew increasingly tyrannical and abusive toward the prisoners, such as waking them in the middle of the night and forcing them to clean the toilets with their bare hands. The participants appeared to forget that this was only a psychological study, and they conformed to their social role as either a prisoner or guard even when they were unaware their behaviour was being observed. After five prisoners had to be released early because of their extreme reactions, the study was terminated after only six days rather than the two weeks it had been planned to run for.

2. In Reicher and Haslam’s (2006) study, a specially created ‘prison’ was built to examine the behaviour of prisoners and guards. Fifteen participants were divided into five groups of three, who were matched as closely as possible on key personality variables. Within each group of three, one participant was randomly chosen to be a guard and the other two prisoners. The study was to run for eight days.

3. Reicher and Haslam found that participants did not conform automatically to their assigned roles, as had happened in Zimbardo’s study. Over the course of the study, the prisoners increasingly identified as a group and worked together to challenge the authority of the guards and establish a more egalitarian set of social relations within the prison. The guards also failed to identify with their role, and were reluctant to impose their authority on the prisoners. This led to a shift of power and the collapse of the prisoner–guard system.

4. Zimbardo et al.’s prison simulation study investigated conformity to social roles, with participants being randomly assigned the role of a guard or a prisoner. The researchers wanted to see how both groups would behave in their roles when there was no authority figure telling them what to do. The guards wore reflective sunglasses, which stopped the prisoners being able to see their eyes, and the prisoners wore a smock with an ID number on it. The prisoners were referred to by their ID number, not their name, and were allowed only certain rights, such as toilet breaks and two visits per week.

The guards quickly conformed to their role, becoming tyrannical and abusive, while the prisoners became passive and accepted their more lowly position. This showed that both groups conformed to their social roles. Even though it was due to last for two weeks, Zimbardo was forced to stop the experiment after six days as it had become too abusive to be allowed to continue. The participants were all judged to be psychologically stable before the study began, but five of the prisoners had to be released before the study was over because they had extreme reactions to the situation in which they found themselves.
Zimbardo believed that the guards’ change in behaviour was an automatic result of them conforming to their social role. However, not all of the guards behaved in this way, which shows that the guards chose their behaviour, meaning that conforming to social roles is not as automatic as Zimbardo claimed it is.

Zimbardo’s experiment was conducted ethically, as participants gave their fully informed consent, but it is still controversial because of the extreme distress the participants experienced. Zimbardo did stop the study early, but he could have stopped it even earlier. Afterwards, he debriefed his participants for a long time and found no long-lasting effects of the study.

Demand characteristics may have affected the Stanford Prison Experiment, with the behaviour of the participants not being due to the prison environment, but instead a response to powerful demand characteristics from the experiment itself. Banuazizi and Movahedi (1975) found that students unfamiliar with the experiment could accurately predict the participants’ behaviour. This suggests that demand characteristics affected the study’s internal validity.

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This area of research has real-world applications, such as, for example, at Abu Ghraib where Iraqi prisoners were maltreated by American soldiers. Zimbardo believed that situational factors influenced the prison guards who committed the abuses. He argued that this, along with no accountability to higher authority, made the maltreatment more likely. This shows that certain situations can lead to people behaving in abusive ways.

People’s tyrannical behaviour might not be due to mindless conformity to a social role, but instead might be to do with the social identity of the individual. Reicher and Haslam (2006) found that the way strong groups behave depends more on this social identity than the role that each individual takes on. This shows that group behaviour is about the norms and values of their social identity, too.

Page 25 No. 1.4

1. In Milgram’s study participants were told that they would play the role of ‘teachers’ who would be required to administer electric shocks of increasing severity on a ‘learner’ if the learner got answers wrong on a task involving remembering word pairs. In the voice feedback study, the learner, sitting in another room, mainly gave wrong answers. Although the teacher believed the shocks were real, they were not. The learner did not respond to the shocks until 300 volts, but at that point pounded on the wall and then gave no response to the next question. If the teacher asked to stop at any point, the experimenter gave him a series of verbal ‘prods’, such as ‘You have no choice you must continue’.

Milgram found that in the voice feedback study, all 40 of the participants went to 300 volts, the point at which the learner first objected to receiving the shocks. At this point, five of the participants disobeyed the experimenter and refused to carry on giving the electric shocks. Although other participants stopped at voltages beyond this, the main finding was that 26 of the 40 participants continued to the maximum shock level of 450 volts.

2. In one of the proximity experiments, the experimenter left the room after giving the teacher instructions about how to conduct the study. If the teacher raised concerns about what they were doing, they spoke to the experimenter by telephone. Milgram found that the vast majority of participants (79%) defied the experimenter when his orders were given by telephone compared with when the experimenter was physically present (35%). This indicates that it is much easier for participants to behave disobediently when the experimenter is physically absent than when he is physically present.

3. When Milgram conducted his original study in the laboratory at Yale University, he found that 65% of participants gave the maximum 450-volt shock. However, when he repeated the study in the less prestigious location of a run-down office in Bridgeport that had no obvious affiliations with Yale, he found that 48% of participants administered the maximum shock. This shows that although the location of the study was an important factor, it did not have a major impact on how obedient participants were.
4. Research has shown that uniforms can have a powerful impact on obedience, as power and authority can become symbolised in the uniform itself. For example, Bushman (1988) carried out a study in which a female researcher dressed in a ‘police-style’ uniform, as a business executive, or as a beggar. The researcher stopped people in the street and told them to give change to a male researcher for an expired parking meter. More people obeyed when the female researcher wore the uniform (72%), compared with when she was dressed as a business executive (48%) or a beggar (52%).

5. Participants in Milgram’s study of obedience were told that it was a study of how punishment affects learning. There were two experimental confederates, an experimenter and a man who was introduced as another participant. This man was the learner. Each genuine participant played the role of the teacher and was required to test the learner on his ability to remember word pairs. Every time the learner got one wrong, the teacher had to give increasingly strong electric shocks, starting at 15 volts and going up to a maximum of 450 volts.

In one condition, the learner, who was sitting in the next room, gave mainly wrong answers and received his fake shocks in silence until it got to 300 volts. Then he pounded on the wall, and did this again at 315 volts before being silent again. If the teacher asked to stop at any point, the experimenter had a series of ‘prods’ to repeat, such as ‘It is absolutely essential you continue’ or ‘You have no other choice, you must go on’. Milgram found that 65% of the participants continued to the maximum 450 volts and all participants went to 300 volts, showing that ordinary people are astonishingly obedient even when asked to do something that goes against their own morality.

One major criticism of Milgram's research is that it has many ethical issues, including deception and no real right to withdraw. Participants were deceived about the true nature of the study, believing it to be an experiment about learning. Also, while the participants were given the right to withdraw, the ‘prods’ from the experimenter, telling them to continue, made it much more difficult for them to exercise this right.

Milgram’s research has also been criticised for underestimating gender differences. We may expect to find women being more obedient than men because of the assumption that women are more susceptible to social influence than men. However, research has not found any difference in obedience rates between men and women, which tells us that there are no gender differences in obedience.

According to Perry (2012), many of Milgram’s participants did not believe the shocks were real. This might be because in Milgram’s study, despite the fact the learner cried out in pain, the experimenter remained cool and distant. This might have led to the participants believing that the learner could not be experiencing any real pain, so the research may lack internal validity.

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Milgram’s research might lack historical validity because it is over 50 years old. However, in 2009, Burger found levels of obedience almost identical to those found by Milgram, suggesting that Milgram’s research does have historical validity, and that his findings still appear to apply as much today as they did back in the early 1960s.

Mandel (1998) argues that the situational factors Milgram demonstrated in the laboratory do not actually influence obedience in real life. For example, in 1942 men were ordered to take part in a mass killing of some Jews. Their commanding officer allowed people to opt out, but very few people chose to opt out. This suggests that situational factors are not the only explanation for obedience, and that variables such as personality may play an important role in influencing how obedient people are.

Page 27 No. 1.5

1. How much we process majority and minority views has also been questioned. Research suggests that we actually process the majority view more than the minority view. Mackie (1987) says that this is because we tend to believe majority group members share similar beliefs to
ours. If they express a different view from the one we hold, we have to consider it carefully to understand why. However, we do not usually spend time trying to understand why a minority’s message is different. This would explain why minority messages are less, rather than more, influential.

2. The perception of legitimate authority plays an important role in obedience, and is the first condition needed for a person to shift to the agentic state. There is a tendency for people to accept definitions of a situation that are provided by a legitimate authority. If an authority figure’s commands are of a potentially harmful or destructive form, then for them to be perceived as legitimate they must occur within some sort of institutional structure. This explains why participants were more likely to behave obediently when the study was conducted at Yale University than when it was conducted in run-down office buildings.

3. One explanation of obedience is the agentic state. This is where the obedient individual does not see themselves as being responsible for their own actions, but they attribute responsibility to someone else. Milgram described this process of shifting responsibility onto another person, often an authority figure, as ‘agentic shift’. This involves moving from an autonomous state, where you feel you are responsible for your own actions, to an agentic state. This is where you see yourself acting as an agent, carrying out someone else’s wishes.

A legitimate authority figure is someone who is considered to be in a position of social control in a given situation. It is this power, not any personal characteristics they have, which gives them the legitimate authority. For an authority to be perceived as legitimate, it must occur within some sort of institutional structure, such as a university or the military. This is especially true if an authority figure’s commands are harmful or destructive.

It has been suggested that ‘plain cruelty’ might explain obedience better than agentic shift. Milgram might have detected signs of cruelty in his participants, who may have used the situation to express their sadistic tendencies. This shows it may not be agentic control which causes obedience. Instead it may be certain aspects of human nature.

The process of agentic shift can explain other forms of social influence, too. The reason for agentic shift is a reduction in someone’s experience of personal control. Fennis and Aarts (2012) showed that reducing personal control resulted in bystander apathy as well as a greater obedience to authority, suggesting that agentic shift is caused by a reduction in our feelings of personal control.

Legitimate authority can be used to justify harming others. In the military, obedience to legitimate authority is vital and this is when extreme obedience occurs no matter how destructive the instructions. This implies that when people allow others to make moral decisions for them, they no longer feel personally responsible. As a result of this lack of personal responsibility, obedience to authority is much more likely to occur.

Extra AO3 material for 16-mark A Level answers

The power of legitimate authority is supported by research by Tarnow (2000), who looked at serious aircraft accidents where flight crew actions were known to have contributed to the accident. Tarnow found that there was excessive dependence on the captain’s authority and expertise in over half of the accidents, showing that even when confronted with dangerous situations, we might not question authority.

Although Milgram claimed people could shift back and forth between an agentic state and an autonomous state, the evidence suggests that this is not always the case. For example, Lifton (1986) in his study of German doctors working at Auschwitz found that they showed a gradual and irreversible transition from caring professionals to individuals who carried out evil acts. This finding suggests that carrying out evil actions over time may change people’s behaviour more than an agentic shift.
1. The authoritarian personality is a distinct personality pattern identified by Adorno et al. (1950). People with this type of personality are rigid thinkers who obey authority, see the world as ‘black and white’, and enforce strict adherence to social rules and hierarchies.

2. Dispositional explanations say that behaviours such as obedience are caused by an individual’s own personal characteristics rather than situational influences within the environment. Adorno et al. (1950) identified a specific personality type they called the ‘authoritarian personality’ as a way of explaining why some people require very little pressure in order to obey. The authoritarian personality is believed to develop when children grow up in a family which places a strong emphasis on obedience. The children acquire the same authoritarian attitudes through a process of learning and imitation.

3. Elms and Milgram (1966) studied participants who had been either obedient or defiant in Milgram’s studies of obedience. The participants completed the California F scale to measure their levels of authoritarianism. They found significant differences between obedient and defiant participants that were consistent with the idea of the authoritarian personality, such as obedient participants reporting being less close to their fathers during childhood and more likely to describe them in negative terms. This suggests that obedience could be explained in dispositional as well as situational terms. However, Elms and Milgram also found that many of the fully obedient participants reported having a very good relationship with their parents, rather than having grown up in the overly strict family environment associated with the authoritarian personality. Another limitation of the study is that it seems implausible that, given the large number of participants who were fully obedient in Milgram’s study, the vast majority would have grown up in such a harsh environment with a punitive father.

4. The authoritarian personality is a dispositional explanation of obedience, which says it is an individual’s personal characteristics that makes them obedient, not the situation they are in. Adorno et al. (1950) used the F scale to measure the different personality traits that make up the authoritarian personality. Agreeing with statements such as ‘Rules are there for people to follow and not change’ indicates an authoritarian personality. People with an authoritarian personality have rigid thinking patterns and see things in black and white. They also think that social rules should always be followed. Adorno thought that people who scored highly on the F scale had learned these attitudes from their authoritarian parents.

This dispositional explanation for obedience is supported by a study by Elms and Milgram (1966), who selected 20 obedient and 20 dissenting participants from Milgram’s original experiment. The participants were asked to complete a personality questionnaire and the F scale questionnaire. The results showed that the obedient participants had higher levels of authoritarianism, suggesting that personality is important in influencing how obedient people are.

Elms and Milgram’s research did, however, show that when participants were asked about their upbringings, many of the fully obedient participants reported a happy childhood and not a strict one. This contradicts Adorno’s research because it suggests that obedience may be caused by something other than a strict upbringing, and that personality is not the only factor that influences how obediently people behave.

One issue with the authoritarian explanation for obedience is that it ignores situational factors. Milgram’s obedience study showed that the social context is more important than someone’s personality as the obedience level changed depending on things such as location. Explaining obedience through authoritarianism cannot account for these variations in obedience levels as they have nothing to do with the personality of the participants.

**Extra AO3 material for 16-mark A Level answers**

Middleton and Meloen (1990) found that less-educated people are consistently more authoritarian than well-educated people. This suggests that it is a lack of education which is responsible for both authoritarianism and obedience. However, when Elms and Milgram controlled for education, the more obedient participants still showed higher levels of authoritarianism. This shows that education level may have some influence, but authoritarianism is a better explanation for obedience.
People with right-wing views are more likely to obey according to Altemeyer. Begue et al. (2014) found that when participants were asked to give (fake) shocks to another participant as part of a game show, the participants who defined themselves as being left-wing gave lower intensity shocks. This suggests that the situational context does not exclude the possibility of individual differences as a determining influence on obedience.

Page 30 No. 1.7

1. Asch found that in one of his studies of conformity in which an ally also gave the right answer, conformity levels dropped sharply from 33% to 5.5%. The most important aspect of social support appears to be that it breaks the unanimous position of the majority. By breaking the unanimity of the majority, an ally raises the possibility that there are other, equally legitimate, ways of thinking or responding. In obedience, research has shown that people are generally more confident in their ability to resist pressures to obey if they can find an ally who is willing to join them in opposing the authority figure. Disobedient peers therefore act as role models on which the individual can model their own behaviour.

2. Locus of control refers to our perception of personal control over our behaviour. People with a strong ‘internal’ locus of control believe that what happens to them is largely a consequence of their own ability and effort. People with a strong ‘external’ locus of control believe that what happens to them is determined by external factors, such as the influence of others or luck. They have a sense that things ‘just happen to them’ and are largely out of their control. Research shows that people high in internality rely less on the opinions of others, and are more likely to display independence in thought and behaviour. This means they are better able to resist social influence. People high in externality tend to approach events with a more passive and fatalistic attitude than internals and are less likely to display independent behaviour. This means they are more likely to accept the influence of others and less able to resist social influence.

3. Research shows that if another person also resists the majority, an individual finds it easier to do the same. Asch found that when one confederate gave the right answer, the participant was much more likely to do the same, with conformity dropping from 33% to 5.5%. This is because the presence of an ‘ally’ breaks the unanimity of the majority and shows that there are other legitimate ways to respond.

Locus of control is a person’s perception of personal control over their own behaviour. If someone has an internal locus of control then they believe that they are in control of their own actions, and are better at resisting social influence than someone with an external locus of control. This is where someone believes an external factor, such as luck or the actions of others, controls what happens to them. These people find it more difficult to resist social influence.

Research shows that social support does not even have to be valid to be effective. Even if the social support we receive is not valid, it still helps us to resist pressure to conform. For example, in Allen and Levine’s (1971) study, a dissenting confederate wore glasses with thick lenses during a visual task. Although this support was not valid, given the nature of the task, conformity was reduced. Although invalid social support does not reduce conformity as much as valid social support, the fact that it does reduce conformity indicates its importance.

Avtgis’ (1998) meta-analysis lends support to the locus of control explanation for resisting social influence. It looked at studies of the relationship between locus of control and different forms of social influence, and showed a significant positive correlation for the relationship between locus of control and scores on measures of persuasion, social influence, and conformity. Those who scored higher on external locus of control tend to be more easily persuaded, more influenced and more conforming than those who scored higher on internal locus of control.

Spector (1983) found a significant correlation between locus of control and a predisposition to normative social influence, with people with an external locus of control more likely to conform than those with an internal locus of control. However, there was no relationship between locus of control and a predisposition to informational social influence. This shows that an internal locus of control is only helpful when conformity occurs to gain approval.
Extra AO3 material for 16-mark A Level answers

Using social support to resist pressures to obey can be seen in the real world. For example, female German protesters challenged Gestapo agents threatening to open fire if women who were demanding the release of family members did not disperse. The support they gave each other meant the Gestapo let their family members go. This shows that Milgram’s finding – a disobedient confederate gives a person the confidence and courage to resist obeying – is true outside of the laboratory, too, which gives Milgram’s research ecological validity.

There is a historical trend in locus of control research. Twenge et al.’s (2004) meta-analysis found that young Americans believed luck influenced their fate more than their own actions. The studies used in this meta-analysis showed that locus of control scores have become substantially more external since the 1960s. Twenge et al. think that this externalisation is due to the alienation young people experience today which they may not have experienced in the past, and their tendency to explain misfortunes in terms of outside forces.

Page 33 No. 1.8

1. Minority influence is a form of social influence in which members of the majority group change their beliefs or behaviours as a result of their exposure to a persuasive minority.

2. One positive criticism of the role of consistency in minority influence is that it is an important factor in helping a numerical minority influence a numerical majority. When people are first exposed to a minority with a differing view, they assume the minority is in error. However, if the minority adopts a consistent approach, others come to reassess the situation and consider the issue more carefully. This is because the majority accept that there must be a reason why the minority takes the position it does, and is sufficiently confident to maintain it over time and with each other.

3. One positive criticism of the role of commitment in minority influence is that there is a ‘tipping point’ where the number of people holding a minority position is sufficient to change majority opinion. Xie et al. (2011) found that just 10% of committed opinion holders are necessary to ‘tip’ the majority into accepting the minority position. This is called the snowball effect, which eventually leads to wide-scale social change, such as all adult citizens eventually having the right to vote in the UK.

4. One positive criticism of the role of flexibility in minority influence is that it is more effective than behaving dogmatically in influencing majorities. For example, Nemeth and Brilmayer (1987) showed that a confederate who put forward an alternative view in a simulated jury study, of how much compensation someone involved in a ski-lift accident should be paid, had no effect on other group members if he refused to change his position. However, a confederate who compromised, and showed some degree of shift towards the majority, did exert an influence on them, provided this occurred late in negotiations.

5. Minority influence is where members of the majority group change their beliefs and behaviours as a result of their exposure to a minority. Research conducted by Moscovici and others shows that the minority needs to be committed to its message and consistent in its approach. At first, the majority often assumes the minority is wrong, but if the minority is consistent in its viewpoint, then others will reassess its point and consider the issue more carefully.

If the minority is committed to its message, then it is more likely to be listened to because it is difficult to ignore a group of people who are committed to their position. It suggests that they are confident in their belief and the minority demonstrates courage as it goes against the norm, sometimes encountering hostility from the majority. The degree of commitment shown by minority group members is greater because of the cost involved in being in the minority and this commitment may persuade majority group members.

Minorities are relatively powerless, so they need to be flexible in their approach, too. They need to negotiate their position with the majority, rather than try to enforce it. A rigid minority that does not compromise may be seen as narrow-minded and unwilling to consider alternative points of view, which will not help them to change the opinions of the majority.
How much we process majority and minority views has also been questioned. Research suggests that we actually process the majority view more than the minority view. Mackie (1987) says that this is because we tend to believe majority group members share similar beliefs to ours. If they express a different view from the one we hold, we have to consider it carefully to understand why. However, we do not usually spend time trying to understand why a minority’s message is different. This would explain why minority messages are less, rather than more, influential.

One strength of dissent in the form of minority opinion is that it ‘opens’ our minds. Van Dyne and Saavedra (1996) studied the role of dissent in work groups, and found that groups made better decisions when a dissenting minority was present. Nemeth (2010) argues that exposure to dissenting opinions makes us think about more options. This shows that, even if dissenters are wrong, they make people think more about an issue.

One problem with minority influence is that convincing people dissenting minorities are valuable remains difficult. We may only superficially accept dissent to appear tolerant. Nemeth argues majority viewpoints persist because a minority viewpoint is often belittled, and dissenters are marginalised. This means opportunities for innovative thinking, which minority influence brings, are often lost.

Extra AO3 material for 16-mark A Level answers

There is research to support the idea that a willingness to be flexible is important in minority influence. For example, Nemeth and Brilmayer (1987) found that confederates holding a minority view who compromised were more influential than confederates who put forward a position but refused to change their position. However, they also found that being too flexible too early on weakens the minority’s position because it looks like they have simply conformed to the majority.

Research also shows that there is a ‘tipping point’ where the number of people holding a minority position is sufficient to change majority opinion. Xie et al. (2011) found 10% of committed opinion holders was necessary to ‘tip’ a majority into accepting the minority position. However, the minority was only successful if they were also consistent in their viewpoint. This shows that commitment and consistency are both needed if minority influence is to be effective.

Page 35 No. 1.9

1. There are five stages in the process by which minority influence leads to social change. First, minorities draw the majority’s attention to an issue using, for example, educational tactics. Second, minorities create cognitive conflict in the majority by making them think more deeply about the issues being challenged. Third, minorities are more likely to be successful when they express their arguments consistently, over time and with each other. Fourth, minorities are more influential if they appear willing to suffer for their views. This is because they are seen as more committed, and so are taken more seriously. Finally, as more and more people consider the issues being raised by minorities, a ‘tipping point’ is reached which leads to wide-scale social change.

2. A good example of social influence leading to social change is the action of the suffragettes in bringing about universal suffrage. The suffragettes used educational, political, and military tactics to draw attention to the fact that women were denied the same voting rights as men. This created a cognitive conflict for majority group members between the existing status quo (only men allowed to vote) and the position advocated by the suffragettes (votes for women). The suffragettes were consistent in their views, regardless of the attitudes of those around them, and their protests and political lobbying continued for years. Because they were willing to risk imprisonment or even death from hunger strike, their influence was augmented. Finally, a ‘tipping point’ was reached at which stage universal suffrage was finally accepted by the majority of people in the UK.

3. One way in which social psychologists could bring about social change in healthy eating habits is through a social norms intervention. Research shows that if people perceive something to be
the norm, they tend to alter their behaviour to fit that norm. So, if people believe that not eating vegetables is the norm, they will conform to that belief. What the psychologists could do is to try and correct this misperception and launch a campaign with a slogan like: ‘Most people (4 out of 5) eat vegetables daily’. By communicating the actual norm concerning eating vegetables, research suggests that people will alter their own behaviour to bring it more into line with other people’s behaviour.

4. Social change occurs when a section of society adopts a new belief or way of behaving which then becomes widely accepted as the norm. If a minority draws attention to an issue, and the majority holds a different view, then there is a conflict, which the majority is motivated to reduce. However, if the minority message is consistent, the minority is more influential, and so it is important for the message to be consistent over time. Initially, the minority’s influence has a relatively small effect, but over time, it spreads more widely as more people consider the issues. When it reaches a ‘tipping point’, there is a wide-scale social change, such as the vote being given to all adults in the UK due to the minority influence of the suffragettes.

The majority can affect social change, too. Behavioural choices are often related to group norms and so if people perceive something to be the norm, then they are more likely to alter their behaviour to fit that norm. Social norms interventions typically start by identifying a risky behaviour in a target population. Perception correction strategies can then be used to help change people’s behaviour. The aim of these strategies is to tell the target population the actual norms, rather than the perceived ones.

History has shown us that social change happens gradually if it is done through minority influence. Because people have a strong tendency to conform to the majority, groups are less likely to engage in social change, and therefore minorities influence the potential for social change rather than direct social change.

Another problem with minority groups influencing social change is that minority groups are often considered by the majority to be deviant. The majority may avoid agreeing with minorities to avoid being perceived as deviant. The message of the minority might, therefore, be less influential because the majority is focusing on the source of the message rather than the message itself.

Social change does not always happen after social norms interventions. For example, some students were given normative information that corrected their misperception of how much students drink. DeJong et al. (2009) found that students’ perceptions did not change, and students did not change their drinking habits. This suggests that social norms interventions alone are not sufficient for social change to occur.

Extra AO3 material for 16-mark A Level answers

Research has shown that behaviour is based more on what we think most other people do rather than what they actually do. So, when a social norms intervention campaign informed people that the actual social norm was not to drink and drive, fewer people drove after drinking. This tells us that when people’s misperceptions about how other people behave are corrected, it is possible for positive changes in behaviour to happen.

However, social norms intervention can sometimes have the opposite effect to what was intended, changing some people’s constructive behaviour to destructive behaviour. For example, Schultz et al. (2007) found a social norms campaign was effective in lowering heavy electricity users’ consumption, but increased consumption in those originally using less. Therefore social norms interventions can produce a ‘boomerang effect’, which is clearly not desirable.
Chapter 2

Some suggested answers to the ‘Can you?’ questions in the Fourth edition AS Complete Companion book are given here. Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Page 45 No. 2.1

1. Duration is a measure of how long information stays in a memory store before it is no longer available. The duration of LTM is unlimited, while the duration of STM without verbal rehearsal is about 18 seconds.

Capacity is a measure of how much can be held in memory. It is represented in terms of bits of information, such as the number of digits.

Coding is the way information is changed so that it can be stored in memory. Information is stored in various forms, such as visual codes (like a picture), acoustic codes (sounds) or semantic codes (the meaning of the experience).

2. Miller reviewed psychological research and concluded that the span of immediate memory is about seven items – sometimes a bit more and sometimes a bit less. He noted that people can count seven dots flashed onto a screen but not many more. The same is true if you are asked to recall musical notes, letters and even words. Miller also found that people can recall five words as well as they can remember five letters – we chunk things together and can then remember more.

However, STM may not be as extensive as Miller first thought. Cowan (2001) reviewed a variety of studies on the capacity of STM and concluded that STM is likely to be limited to about four chunks. Also, research on the capacity of STM for visual information, rather than verbal stimuli, found that four items was about the limit. This means that the lower end of Miller’s range is more appropriate, i.e. 7 – 2 or 5 items.

Another important finding is that the capacity of STM is not the same for everyone, and increases with age. This age increase might be due to a gradual increase in brain capacity and/or because people develop strategies to improve their digit span as they get older, such as ‘chunking’.

It also seems that the size of the chunk affects how many chunks you can remember. For example, Simon (1974) found that people had a shorter memory span for larger chunks, such as eight-word phrases, than smaller chunks, such as one-syllable words. This shows that the size of the chunk matters when looking at the capacity of STM.

3. Peterson and Peterson (1959) studied the duration of STM using 24 students. Each student was tested over eight trials. On each trial, a participant was given a consonant syllable and a three-digit number (e.g. THX 512). They were asked to recall the consonant syllable after a retention interval of 3, 6, 9, 12, 15 and 18 seconds. During the retention interval, they had to count backwards from their three-digit number. Participants, on average, were 90% correct after 3 seconds, 20% correct after 9 seconds and only 2% correct after 18 seconds. This suggests that STM has a very short duration as long as verbal rehearsal is prevented.

However, a weakness of this study is that the way STM was tested is artificial. Trying to memorise consonant syllables does not reflect most everyday memory activities where what we are trying to remember is meaningful. However, we do sometimes try to remember fairly meaningless things, such as groups of numbers (phone numbers) or letters (postcodes), so the study does have some relevance to everyday life.

In the Petersons’ study, participants were counting the numbers in their STM and this may displace or ‘overwrite’ the syllables to be remembered. Reitman (1974) used auditory tones instead of numbers so that displacement would not occur (sounds do not interfere with verbal rehearsal) and found the duration of STM is longer. This suggests that forgetting in the Petersons’ study was due to displacement and not decay, and that the study was not actually measuring the duration of STM.
4. Baddeley (1966) used word lists that had acoustically similar but semantically different words, and word lists that had acoustically different but semantically similar words, to test the effects of acoustic and semantic similarity on STM and LTM. He found that participants had difficulty remembering acoustically similar words in STM, but not in LTM, whereas semantically similar words posed little problem for STM but led to muddled LTM. This suggests that STM largely encodes verbal material acoustically whereas LTM largely encodes it semantically.

In general, STM appears to rely on an acoustic code for storing information. However, Brandimonte et al. (1992) found that participants used visual coding in STM if participants were given a visual task and prevented from doing any verbal rehearsal in the retention period before performing a visual recall task. This suggests that normally we ‘translate’ visual images into verbal codes in STM but, if verbal rehearsal is prevented, we have to use an alternative, such as visual codes.

In general, coding in LTM seems to be semantic. However, this may not always be the case. For example, Frost (1972) showed that long-term recall was related to visual as well as semantic categories, and Nelson and Rothbart (1972) found evidence of acoustic coding in LTM. Therefore, it seems that coding in STM or LTM is not simply acoustic or semantic, but can vary according to circumstances.

Page 47 No. 2.2

1. The multi-store model of memory (MSM) says that information enters from the environment and goes to the sensory register. The sensory register is the place where information is held at each of the senses and the corresponding areas of the brain. If a person’s attention is focused on one of the sensory registers, the data is transferred to short-term memory (STM). Information is held in STM so it can be used for immediate tasks, such as working on a maths problem. Repetition keeps information in STM, but eventually such repetition will create a long-term memory (LTM). The model says that the more information is rehearsed, the better it is remembered. This is called maintenance rehearsal. LTM is potentially unlimited in duration and capacity. Retrieval is the process of getting information from LTM and involves passing it back through STM where it is then available for use.

2. One criticism of the multi-store model is that it is too simplistic. The model says that LTM is a single unitary store. However, research shows that there are different types of LTM and each behaves differently. Maintenance rehearsal can explain long-term storage of semantic memory (memory for our knowledge about the world). However, it cannot explain long-term episodic memory (memories for things that we have experienced).

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Controlled laboratory studies on capacity, duration and coding support the existence of a separate short- and long-term store, which is the basis of the MSM. Studies using brain-scanning techniques have also demonstrated a difference between STM and LTM. For example, Beardsley (1997) found the prefrontal cortex is active during STM, but not LTM, tasks, and Squire et al. (1992) found the hippocampus is active when LTM is engaged.

There is further support for the MSM from case studies. Psychologists have also shown that different areas of the brain are involved in LTM and STM from their study of individuals with brain damage. HM’s brain damage was caused by an operation to remove the hippocampus from both sides of his brain to reduce the severe epilepsy he had suffered. HM’s personality and intellect
remained intact, but he could not form new LTMs, although he could remember things from before the surgery.

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**Extra AO3 material for 16-mark A Level answers**

A limitation of the MSM is that long-term memory involves more than maintenance rehearsal. Craik and Lockhart suggested that enduring memories are created by the amount of processing you do, rather than through maintenance rehearsal. Things that are processed more deeply are more memorable just because of the way they are processed. ‘Deep’ means doing more complicated things with the item to be remembered, rather than just repeating it.

STM and LTM may not be clearly separate. The MSM suggests that STM is involved before LTM. However, Logie (1999) pointed out that STM relies on LTM and therefore cannot come first, as suggested in the MSM. In order to chunk information in STM, you need to recall the meaningful groups of letters and such meanings are stored in LTM. Ruchkin *et al.* (2003) have concluded that STM is actually just a part of LTM.

**Page 49 No. 2.3**

1. The working memory model (WMM) says that STM has a number of different components. One of these is the central executive. The function of the central executive is to direct attention to particular tasks, determining at any time how the brain’s ‘resources’ are allocated to tasks. Data arrives from the senses or from long-term memory. It uses different ‘slave systems’ as ‘resources’ to deal with information.

   The phonological loop deals with auditory information and is divided into the phonological store, which holds the words you hear, and an articulatory process which is used for words that are heard or seen. These words are silently repeated. The visuo-spatial sketchpad is used when you have to plan a spatial task. The visuo-spatial sketchpad can be divided into a visual cache, which stores information about visual items, and an inner scribe which deals with spatial relations.

   The episodic buffer integrates information from the central executive, and the slave systems. It maintains a sense of time sequencing, basically recording events that are happening. It also sends information to LTM.

2. Hitch and Baddeley (1976) gave participants a task to occupy the central executive (e.g. they were given a statement ‘B is followed by A’ then shown two letters such as AB and asked to say true or false). A second task either involved the articulatory loop (e.g. they were asked to say ‘the the the’ repeatedly) or involved both the central executive and the articulatory loop (saying random digits). Hitch and Baddeley found that the first task was slower when the second task involved both the central executive and the articulatory loop, supporting the idea that the central executive is one of the components of working memory.

3. Some important research supporting the working memory model comes from patients with brain injuries. The problem is that the process of brain injury is traumatic and it might be this trauma that changes the behaviour so that a person does not perform as well on certain tasks. It may also be that these patients have other difficulties with things such as paying attention, so they underperform on certain tasks because of this. This means that we cannot be sure what is causing the impairment in their performance.

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Studies of individuals with brain damage support the working memory model. Shallice and Warrington (1970) studied KF whose short-term forgetting of auditory information was much greater than that of visual information. In addition, his auditory problems were limited to verbal material, such as letters and numbers, but not meaningful sounds, like the phone ringing. Therefore his brain damage seemed to be restricted to the phonological loop, suggesting separate visual and verbal systems.

Although some research supporting the working memory model comes from patients with brain injuries, the problem is that the process of brain injury is traumatic and it might be this trauma that changes the behaviour so that a person does not perform as well on certain tasks. It may also be that these patients have other difficulties with things such as paying attention, so they underperform on certain tasks because of this. This means that we cannot be sure what is causing the impairment in their performance.

There is also concern about the central executive as some psychologists feel it is too vague and the idea of a single central executive is too simplistic. Eslinger and Damasio (1985) studied EVR who had a cerebral tumour removed. He performed well on reasoning tasks, which suggested that his central executive was intact. However, he had poor decision-making skills, which suggests that his central executive was not in fact wholly intact. This shows that the central executive is more complex than the working memory model suggests.

**Extra AO3 material for 16-mark A Level answers**

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There is research evidence for the phonological loop. The phonological loop explains why the word-length effect occurs. Research (Baddeley et al., 1975) shows that the phonological loop holds the amount of information you can say in two seconds, making it harder to remember a list of long words compared to short words. The longer words can’t be rehearsed on the phonological loop because they don’t fit. These findings support the idea of a phonological loop in the WMM.

**Page 51 No. 2.4**

1. Episodic memories are about knowing *that*. The term ‘episodic’ refers to the memories being about an event, or groups of events, occurring as part of a larger sequence. This kind of memory is concerned with your personal experiences, with your recollection of your first day at school, a family holiday, playing with friends and so on. You may recall the time and place of such events, as well as who was there. You also may recall the context surrounding the event, such as what happened just before or after, or why you were there. You may also recall associated emotions that you felt at the time.

2. Semantic memories are about knowing *that*, such as knowing that people of a certain age go to school, and that the capital of England is London. Semantic memories are knowledge of the world which is shared by everyone. Semantic memories may relate to things, such as the
functions of objects, to what behaviour is appropriate, such as social customs. However, they may also relate to abstract concepts, such as mathematics and language. Semantic memories generally begin as episodic memories because we acquire knowledge based on personal experiences. There is a gradual transition from episodic to semantic memory where the memory slowly loses its association to particular events, so that the information can be generalised as a semantic memory.

3. Procedural memory is concerned with skills, such as knowing how to tie a shoelace, knowing how to dive into a swimming pool or knowing how to read. It is about remembering how to do something rather than knowing the rules of what to do. Procedural memories are typically acquired through repetition and practice. This kind of memory is implicit. We are less aware of these memories because they have become automatic. Often, if you think too much about procedural memories it prevents you acting them out. This attention to the step-by-step procedure disrupts the well-learned, automatic performance. It is important that procedural memories are automatic so we can focus our attention on other tasks while performing these everyday skills.

4. The distinction made between the three kinds of memory is supported by research using brain-scanning techniques. This shows that different parts of the brain are active when the different kinds of LTMs are active. Episodic memory is associated with the hippocampus and other parts of the temporal lobe where the hippocampus is located. It is also associated with activity in the frontal lobe. Procedural memory activation is associated with the cerebellum, which is involved in the control of fine motor skills, as well as the motor cortex. The basal ganglia and limbic systems are also involved in this kind of learning.

5. Episodic memories are about knowing that. This kind of memory is concerned with your personal experiences. You may recall the time and place of such events as well as who was there. You also may recall the context surrounding the event.

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Procedural memory is concerned with skills, such as knowing how to tie a shoelace, knowing how to dive into a swimming pool or knowing how to read. It is about remembering how to do something rather than knowing the rules of what to do. Procedural memories are typically acquired through repetition and practice, and this kind of memory is implicit.

The case study of HM showed that he could still learn new procedural memories after his surgery, but he could not form new episodic or semantic memories. He was able to learn how to learn to draw a figure by looking at its reflection in the mirror, according to Corkin (2002). However, he had no memory that he had learned this skill (episodic memory). The fact that he could learn new procedural memories, but not declarative memories, shows that these are separate components of LTM.

The distinction made between the different kinds of LTM is supported by research using brain-scanning techniques. This shows that different parts of the brain are active when the different kinds of LTMs are active. Episodic memory is associated with the hippocampus and it is also associated with activity in the frontal lobe. Procedural memory activation is associated with the cerebellum, which is involved in the control of fine motor skills, as well as the motor cortex.

The relationship between episodic and semantic memories raises the question of whether episodic memories are a gateway to forming semantic memories, or whether it is possible to form semantic memories independently. Researchers have found some patients with Alzheimer’s disease who retain the ability to form new episodic memories but not semantic memories. They have also found Alzheimer’s patients who have the reverse – poor semantic memories, but generally intact episodic memories. This suggests that episodic memories may be a gateway to semantic memory, but it is possible to form semantic memories independently.
Extra AO3 material for 16-mark A Level answers

There is a problem with using research results from patients with brain injuries. It is difficult to be certain of the exact parts of the brain that have been affected until the person has died, and most studies are done with people who are still alive. Damage to a particular area of the brain does not mean that area is responsible for a particular behaviour, as it may just be acting as a relay station. Malfunction of the relay station would also impair performance.

It may be that there are more than three kinds of LTM. Priming describes how implicit memories influence the responses a person makes to a stimulus. Research shows that priming is controlled by a brain system separate from the temporal system that supports explicit memory (semantic and episodic memory). This has led to the suggestion that there is a fourth type of LTM, the perceptual-representation system memory, related to priming, which is automatic enhanced recognition of specific stimuli.

Page 53 No. 2.5

1. Proactive interference is when past learning interferes with an attempt to learn something new. For example, if you originally learned to drive on the left-hand side of the road (past learning), but went to a country where they drive on the right-hand side of the road (new learning), continuing to drive on the left-hand side would be an example of proactive interference.

Retroactive interference is when new learning interferes with past learning. For example, if you eventually learned to drive on the right-hand side, but then had to drive on the left-hand side again, continuing to drive on the right-hand side would be an example of retroactive interference. The new thing you had learned (driving on the right-hand side) interferes with the past thing you had learned (driving on the left-hand side).

2. In McGeoch and McDonald’s (1931) study of retroactive interference, participants were required to learn a list of ten adjectives (List A). They were then required to learn a second list of ten adjectives (List B). After this, they attempted to recall the List A adjectives. Compared with a control group who only learned List A and had to recall it, their recall was much poorer, especially if List B was synonyms of List A. If List B was numbers, List A was much better recalled. This shows that interference is strongest the more similar the items are.

3. Interference theory is an explanation for forgetting in terms of one memory disrupting the ability to recall another. Interference is most likely to occur when the two memories have some similarity. Proactive interference is where past learning interferes with attempts to learn something new. This is because the original memory for something interferes with the formation of new memories associated with it. Retroactive interference is where current attempts to learn something interfere with our past learning. For example, if you learn to drive using a manual car, then you buy an automatic car. When you return to using a manual car, you may forget to change gears (or to use the clutch). The later learning has interfered with earlier learning.

There is some evidence that supports the idea of both proactive and retroactive interference. However, one problem with this research is that it often uses rather artificial lists of words and/or nonsense syllables. Thus, the findings may not relate to everyday uses of memory, which tends not to use word lists. This means that the research is low in ecological validity.

While interference effects do occur in everyday life, they do not occur that often. Rather special conditions are required for interference to lead to forgetting, namely that the two memories need to be quite similar. This is why interference is considered to be a relatively unimportant explanation for everyday forgetting. There is no doubt that interference plays a role in forgetting, but how much forgetting can be attributed to interference remains unclear.

Researchers have often questioned whether interference effects actually cause a memory to disappear or whether interference effects are just temporary. Ceraso (1967) found that, if memory was tested again after 24 hours, recognition (accessibility) showed considerable spontaneous recovery, whereas recall (availability) remained the same. This suggests that interference occurs because memories are temporarily not accessible rather than having actually been lost.
Extra AO3 material for 16-mark A Level answers

Real-life applications are a benefit of interference theory. There is a considerable body of research on the effects of interference when people are exposed to adverts from competing brands within a short time period. Dahaner et al. (2008) found that both recall and recognition of an advertiser’s message were impaired when participants were exposed to two advertisements for competing brands within a week. One strategy might be to enhance the memory trace by running multiple exposures to an advertisement on one day rather than spread these out over a week. This results in reduced interference from competitors’ advertisements.

One limitation is that there is evidence that some people are less affected by proactive interference than others. Kane and Engle demonstrated that individuals with a greater working memory span were less susceptible to proactive interference. Participants were given three word lists to learn. Those participants with low working memory spans showed greater proactive interference when recalling the second and third lists than did participants with higher spans. Therefore interference doesn’t always cause problems for memory.

Page 55 No. 2.6

1. Cues are things that serve as a reminder. They may meaningfully link to the information, or may be environmental cues, or cues related to your mental state. Retrieval depends on using these cues. If these cues are not present then retrieval failure happens and you can’t remember the information.

2. Godden and Baddeley (1975) investigated the effect of contextual cues on recall. They recruited scuba divers as participants and arranged for them to learn a set of words either on land or underwater. Subsequently, they were tested either on land or underwater, so there were four experimental conditions. The results showed that highest recall occurred when the initial context matched the recall environment (e.g. learning on land and recalling on land).

3. Tulving and Thomson (1973) proposed that memory is the most effective if information that was present at encoding is also available at the time of retrieval. The encoding specificity principle states that a cue doesn’t have to be exactly right, but the closer the cue is to the original item, the more useful it will be. There is evidence of cues that have been explicitly or implicitly encoded at the time of learning and have a meaningful link to the learning material. There is another type of cue which is not related to the learning material in any meaningful way. Whenever any information is learned, we also often remember where we were (environmental context) or how we felt (the emotional state at the time). This information is encoded to various degrees along with the material learned. If these cues are not present at recall, then we might forget the information.

There is a lot of research support for the importance of retrieval cues on memory. This research includes laboratory, field and natural experiments as well as anecdotal evidence and thus has relevance to everyday memory experience. An obvious application of this research is to use it to improve recall when you need to, for example, when taking exams. Smith (1979) showed that just thinking of the room where you did the original learning (mental reinstatement) was as effective as being in the same room at the time of retrieval. Another application of retrieval cues is the cognitive interview that the police use.

However, retrieval cues do not always work. The information you are learning is related to a lot more than just the cues. In most of the research, participants are learning word lists, but when you are learning, usually you are learning about complex associations that are less easily triggered by single cues. According to Smith and Vela (2001), context effects are largely eliminated when learning meaningful material. This means that retrieval cues cannot explain everything.
Extra AO3 material for 16-mark A Level answers

One problem with the retrieval cue explanation is that Baddeley (1997) pointed out that the encoding specificity principle is impossible to test because it is circular. If a stimulus leads to the retrieval then it must have been encoded in memory. If it does not, then it can't have been encoded in memory. But it is impossible to test for an item that hasn't been encoded in memory, so this cannot be proved.

Retrieval failure can also explain interference effects. Tulving and Psotka (1971) gave participants six different word lists to learn. Some participants learned only one list, others learned two, and so on. Tulving and Psotka found evidence of retroactive interference in those who had more than one list to learn. However, when they were given cued recall, the effects of interference disappeared, showing that the information is there but cannot be retrieved. This shows that retrieval failure is a more important explanation of forgetting than interference.

Page 57 No. 2.7

1. A leading question is one that, either by its form or content, suggests to the witness what answer is desired or leads to the witness giving the desired answer. For example, participants in Loftus and Palmer's (1974) experiment were asked: 'How fast were the cars going when they smashed into each other?' This is a leading question because it suggests the answer that the participant might give.

2. Post-event discussion refers to a conversation between co-witnesses or an interviewer and an eyewitness after a crime has taken place. This might contaminate a witness's memory for the event. The memory of an event may be altered or contaminated through discussing events with others and/or being questioned multiple times. This might create inaccuracy in eyewitness testimony.

3. Loftus and Palmer (1974) asked 45 students to watch seven films of different traffic accidents. After each film, the participants were given a questionnaire, which asked them to describe the accident and then answer a set of specific questions about it. The critical question was ‘About how fast were the cars going when they hit each other?’ One group of participants was given this question. The other four groups were given the verbs, ‘smashed’, ‘collided’, ‘bumped’ or ‘contacted’ in place of the word ‘hit’. This critical question was a leading question because it suggests the answer that the participant might give. Loftus and Palmer found that participants who were asked how fast the cars were going when they ‘smashed’ into each other estimated the speed to be, on average, 40.8 mph, while those who were asked how fast the cars were going when they ‘contacted’ each other gave an average speed estimate of 31.8 mph. This shows that leading questions affect the response of eyewitnesses.

4. Loftus and Palmer (1974) asked 45 students to watch seven films of different traffic accidents. Afterwards, one group of participants was asked ‘About how fast were the cars going when they hit each other?’ The other four groups were given the verbs, ‘smashed’, ‘collided’, ‘bumped’ or ‘contacted’ in place of the word hit. Loftus and Palmer found that participants in the ‘smashed’ condition estimated the speed to be, on average, 40.8 mph, while those in the ‘contacted’ condition gave an average speed estimate of 31.8 mph.

Gabbert et al.'s (2003) study had participants in pairs, where each partner watched a different video of the same event, so that they each viewed unique items. Pairs in one condition were encouraged to discuss the event before each partner individually recalled the event they watched. A very high number of witnesses (71%) who had discussed the event went on to mistakenly recall items acquired during the discussion.

There has been considerable support for research on the effect of misleading information. Braun et al. (2003) asked college students to evaluate advertising material about Disneyland. Embedded in this information was misleading information about either Bugs Bunny or Ariel (neither character could have been seen at Disneyland because Bugs is not Disney and Ariel hadn’t been introduced at the time of their childhood). Participants in the Bugs Bunny or Ariel group were more likely to report having shaken hands with these characters than the control group. This shows that misleading information can create a false memory.
Laboratory experiments, such as those carried out by Loftus, may not represent real life because people don’t take the experiment seriously and/or they are not emotionally aroused in the way they would be in a real accident. Foster et al. (1994) found that if participants thought they were watching a real-life robbery, and also thought their responses would influence the trial, their identification of a robber was more accurate.

There are important real-life applications of this research. The criminal justice system relies heavily on eyewitness identification for investigating and prosecuting crimes. Psychological research has been used to warn the justice system of problems with eyewitness evidence. Recent DNA exoneration cases have confirmed the warnings of eyewitness identification researchers, by showing that mistaken eyewitness identification was the largest single factor contributing to the conviction of these innocent people. This shows how important the research on misleading information has been to ensuring that innocent people are not imprisoned.

**Extra AO3 material for 16-mark A Level answers**

It might be a response bias that affects accuracy. In Bekerian and Bowers’ (1983) research, participants in one condition were given a set of questions each matched with data that was either consistent or inconsistent, and later asked the same questions in a different order. Participants in the other condition were asked the same questions in the same order. In the first condition, participants were less accurate on the later questions if they had been given inconsistent data (a kind of leading question), but there was no difference in the second condition. This suggests that the order of questions had a significant effect, so memory change was due to response bias.

An eyewitness typically acquires information from two sources; from observing the event itself and from subsequent suggestions (misleading information). A number of studies have shown that elderly people have difficulty remembering the source of their information, even though their memory of the event itself is unimpaired. This means they become more prone to the effect of misleading information, compared to younger subjects.

**Page 59 No. 2.8**

1. Anxiety may have a negative effect on the accuracy of eyewitness testimony. This might be because we are so anxious that we focus on how we are feeling and not on the event itself. Stress has a negative effect on our memory so we recall less about the event than we would if we had not been feeling anxious at the time.

2. Johnson and Scott (1976) asked participants to sit in a waiting room where they heard an argument in an adjoining room and then saw a man run through the room carrying either a pen covered in grease (low anxiety) or a knife covered in blood (high anxiety ‘weapon focus’). Participants were later asked to identify the man from a set of photographs. The researchers found that the man carrying the pen was identified 49% of the time, whilst the man carrying the knife was recognised only 33% of the time. This suggests that anxiety can impair the accuracy of eyewitness testimony.

3. Christianson and Hubinette (1993) found evidence of enhanced recall under high anxiety conditions when they questioned witnesses to bank robberies. The witnesses were either victims (high anxiety) or bystanders (low anxiety). The interviews were conducted 4–15 months after the robberies. The researchers found that all witnesses showed generally good memories for details of the robbery itself. Those witnesses who were the most anxious had the best recall of all.

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One problem with this research is that weapon focus may not be caused by anxiety. Pickel (1998) proposed that the reduced accuracy of identification due to the weapon focus effect may be due to surprise rather than anxiety. To test this, she arranged for participants to watch a thief enter a hairdressing salon carrying scissors (high threat, low surprise), handgun (high threat, high surprise), wallet (low threat, low surprise) or a raw chicken (low threat, high surprise). Identification was least accurate in the high surprise conditions, rather than the high threat. This supports the view that weapon focus effect is related to surprise, not anxiety.

One of the strengths of Christianson and Hubinette’s research was that it was a study of anxiety in the context of a real crime. It may well be the case that laboratory studies do not create the real levels of anxiety experienced by real eyewitnesses during an actual crime. Deffenbacher et al. (2004) found that laboratory studies in general demonstrate that anxiety leads to reduced accuracy and that real-life studies are associated with an even greater loss of accuracy, which is at odds with the result from Christianson and Hubinette.

The study by Christianson and Hubinette concerned violent real-life crime. Many other studies of anxiety and accuracy of identification, even the real-life ones, did not involve violence. Halford and Milne (2005) found that victims of violent crime were more accurate in their recall of the crime scene information than victims of non-violent crimes. This shows that there is no simple rule about the effect of accuracy on eyewitness testimony.

Extra AO3 material for 16-mark A Level answers

It has been suggested that one key extraneous variable in many studies of anxiety is emotional sensitivity. Bothwell et al. (1987) assessed participants for neuroticism – a personality characteristic where individuals tend to become anxious quite quickly. Participants were labelled as neurotic or stable, and it was found that the stable participants showed rising levels of accuracy as stress levels increased whereas the opposite was true of neurotics. The modest effect sizes shown in many studies of anxiety may be the result of averaging out low accuracy and high accuracy scores of sensitive and non-sensitive participants respectively.

A criticism of the weapon focus effect comes from an alternative theory. Fazey and Hardy (1988) put forward the catastrophe theory which predicts that when physiological arousal increases beyond the optimum level, the inverted U hypothesis predicts a gradual decrease in performance. Fazey and Hardy observed that there is sometimes a catastrophic decline, which they suggest is due to increased mental anxiety. This means that the inverted U only describes an increase in physiological anxiety.

Page 61 No. 2.9

1. One technique that is used in the cognitive interview is to recall things in a different order. This is where the interviewer asks the witness to recall an event from the end to the beginning. If you have to recall the events from the end of the event backwards, then this stops a pre-existing schema from influencing what you recall.

   Another technique used in the cognitive interview is to recall from a different perspective. This is where an interviewer asks the witness to recall the incident by imagining they were standing on the other side of the street, or how it might have appeared to other witnesses. This is done to disrupt schemas having an impact on recall.

2. A standard interview essentially only involves the interviewer asking a lot of questions that require a forced choice answer, like asking what colour a getaway car was. Questions are often written down beforehand, and witnesses are discouraged from adding extra information. This is different from a cognitive interview, which asks participants to report everything, no matter how insignificant it might seem to them. It also involves asking them to recreate the scene in their minds so they have the physical and psychological environment of the original incident in their mind. These act as cues, helping their recall. This does not happen in the standard interview.

3. Geiselman et al. (1984) developed the cognitive interview (CI). The first technique is the mental reinstatement of the context. This is where the interviewee is encouraged to mentally recreate both the physical and psychological environment of the original incident.
The second technique is ‘report everything’, where the interviewer encourages the reporting of every single detail of the event, even though it may seem irrelevant or insignificant. This is because memories are interconnected with one another, so that recollection of one item may then cue a whole lot of other memories.

The CI also uses the ‘change order’ technique. This is where the interviewer may try alternative ways through the timeline of the incident, for example by reversing the order in which events occurred.

The last technique is called Change Perspective. The interviewee is asked to recall the incident from multiple perspectives, for example by imagining how it would have appeared to other witnesses.

Research supports the effectiveness of the cognitive interview. A meta-analysis of 53 studies found, on average, an increase of 34% in the amount of correct information gathered in the CI compared with the standard interviewing techniques. However, the effectiveness of the CI may be due more to some individual elements than the whole thing. Milne and Bull (2002) interviewed undergraduates and children using just one individual component of the Cognitive Interview and compared the responses gathered to a control condition (who were simply instructed to ‘try again’). Recall across each of the four different components was broadly similar and no different from that of the control group.

There may be a problem with information the CI collects. The CI procedure is designed to enhance the quantity of correct recall without compromising the quality of that information. However, it may be that effectiveness has largely been in terms of quantity. Köhnen et al. (1999) found an 81% increase in correct information, but also a 61% increase in incorrect information when the enhanced CI was compared with a standard interview. This means that police need to treat all information collected from cognitive interviews with caution as the CI does not guarantee accuracy.

Kebbell and Wagstaff (1996) reported a problem with the CI in practice. Police officers suggest that this technique needs more time than is often available and they prefer to use deliberate strategies aimed to limit an eyewitness’s report to the minimum amount of information that they feel is necessary. In addition, the CI requires special training, and many forces have not been able to provide more than a few hours. For these reasons, the use of the CI has not been widespread.

Extra AO3 material for 16-mark A Level answers

One of the problems with evaluating the effectiveness of the CI when it is used in the real world is that it is not really one ‘procedure’ but a collection of related techniques. The Thames Valley Police use a version that does not include the ‘changing perspectives’ component. Other police forces that describe themselves as using the cognitive interview have tended to use only the ‘reinstate context’ and ‘report everything’ components of the cognitive interview.

One advantage is that the CI may be particularly useful when interviewing older witnesses. Negative stereotypes about older adults’ memories, such as the belief that it declines dramatically with age, can make such witnesses overly cautious about reporting information. However, the CI may overcome such difficulties because it stresses the importance of reporting any detail, regardless of its perceived insignificance.
Chapter 3

Some suggested answers to the ‘Can you?’ questions in the Fourth edition AS Complete Companion book are given here. Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Page 71 No. 3.1

1. Interactional synchrony is when the caregiver and infant react ‘in time’ with each other and mirror what the other is doing in terms of their facial and body movements. This includes imitating emotions as well as behaviours. Infants as young as two to three weeks old will imitate specific facial and hand gestures.

2. Reciprocity is when a caregiver responds to the baby’s actions with a similar action. From birth, babies move in a rhythm when interacting with an adult, like they are taking turns, although the responses are not necessarily similar as in interactional synchrony.

3. Murray and Trevarthen (1985) conducted a study with two-month-old infants. The infants first interacted via a video monitor with their mother in real time. Later a video recording of the mother was replayed to the infants so that the image on the screen was not responding to the infant’s facial and bodily gestures. The researchers found that the infants became intensely distressed, and they tried to attract their mother’s attention, but when they didn’t get a response, they turned away. This shows that infants actively want to interact with their mother.

4. One of the key interactions between caregivers and infants is their non-verbal communication, and these interactions may form the basis of attachment between an infant and caregiver. The more sensitive each is to the other’s signals, the deeper the relationship. Research in the 1970s demonstrated that infants coordinated their actions with caregivers in a kind of conversation. From birth, babies move in a rhythm when interacting with an adult, like they were taking turns, which is an example of reciprocity. The regularity of an infant’s signals allows a caregiver to anticipate their behaviour and respond appropriately.

There is also a slightly different kind of interaction between infants and caregivers called interactional synchrony. This is when the caregiver and infant react ‘in time’ with each other. Meltzoff and Moore (1977) found that infants as young as two to three weeks old imitated specific facial and hand gestures and the researchers proposed that this imitation is intentional.

One problem with this research is that it is difficult to test infant behaviour reliably. Their mouths are nearly always moving and the expressions that are tested, such as tongue out or smiling, occur frequently. This means that it is difficult to distinguish between general activity and specific imitated behaviours.

Another problem in research investigating caregiver-infant interactions is that the findings have failed to be replicated. Research by Koepke et al. (1983) failed to replicate the findings of Meltzoff and Moore. However, Meltzoff and Moore argued that Koepke et al.’s research was less controlled. This shows that the findings from interactional synchrony research may lack reliability.

A strength of examining infant behaviours comes from research investigating intentional behaviour. Research has shown that infants do not respond to inanimate objects. Abravanel and DeYong (1991) found that 5–12-week-old infants made little response to objects. This suggests that infants do not imitate anything they see and only respond to specific social responses.

Extra AO3 material for 16-mark A Level answers

One important feature of interactional synchrony is that there is some variation between infants. Isabella et al. (1989) found that the more strongly attached caregiver–infant pairs showed greater interactional synchrony. This shows that children will respond to adults differently based on the nature of their attachment. However, it is not clear whether the imitation is a cause or an effect of this early synchrony.
One strength of research into interactional synchrony is its application to later adult relationships. Meltzoff (2005) proposed the ‘like me’ hypothesis which explains how infants acquire an understanding of what other people are thinking and feeling. This means that they have the skills to develop a Theory of Mind. This shows how interactional synchrony might help children to develop this ability which is so important for social relationships.

Page 73 No. 3.2

1. The term ‘multiple attachments’ means that the infant has more than one attachment figure. They might, for example, be attached to their mother and their father and their grandmother.

2. Schaffer and Emerson (1964) observed 60 infants from Glasgow, initially aged 5–23 weeks, until they were one year old. The mothers were visited every four weeks. At each visit, the mother reported the infant’s response to separation in everyday situations (e.g. being left alone, or with other people) and this was rated on a four-point scale. The mother was also asked to whom the protest was directed. Schaffer and Emerson also studied stranger anxiety by seeing how the infant responded to the researcher. They found that after 7 months, infants began to display separation anxiety when a particular person left them alone and they showed joy at being reunited with that person. They also started to show stranger anxiety, which is another sign that specific attachments had formed by that point. Schaffer and Emerson found that primary attachments were not always formed with the person who spent most time with the child. The researchers observed that intensely attached infants had mothers who responded quickly and sensitively to their ‘signals’ and who offered their child the most interaction.

3. Lamb (1997) reported that studies have shown little relationship between attachment and the amount of time the father spends with the infant. This might be because men lack the emotional sensitivity that women have, because women have more oestrogen. It might also be because, in most societies, there are sex stereotypes that say women are meant to care for children and if a man does it, then he is rather feminine. Heerman et al. (1994) found that men are less sensitive to infant cues than mothers are. However, Frodi et al. (1978) showed video tapes of infants crying and found no differences in the physiological responses of men and women. There is an alternative argument that fathers may be secondary attachment figures. This may be because they are more playful and provide more challenging situations for their children. It could be that a lack of sensitivity from fathers can be seen as positive because it fosters problem-solving by making greater communicative and cognitive demands on children.

4. Schaffer and Emerson (1964) constructed a description of how attachments develop using the findings of their observation study of infants in Glasgow. They identified the first stage as ‘indiscriminate attachments’ which happens from birth until the baby is about two months old. Babies produce similar responses to all objects, but towards the end of this period they begin to show a greater preference for social stimuli like smiling faces.

   The next stage is where attachment begins to happen. At around four months old, babies become more social, preferring human company to inanimate objects and can distinguish between familiar and unfamiliar people. They are still relatively easily comforted by anyone and do not yet show anxiety with strangers.

   By seven months, infants begin to show separation anxiety when separated from one particular person, and they show joy at reunion with that person. They also begin to show stranger anxiety. This stage is called the ‘discriminate attachment’ stage.

   After the main attachment is formed, the infant also develops a wider circle of multiple attachments, depending on how many consistent relationships they have.

   One problem with Schaffer and Emerson’s research is that it is a stage theory. These kinds of theory suggest that development occurs in a specific order, making it rather inflexible. Schaffer and Emerson claim that single attachments must come before multiple attachments, which in some situations or cultures may not be the case. This is a problem because these stages may become a standard by which families are judged and could lead to them being classed as abnormal.
Another criticism of this research comes from cross-cultural studies. Sagi et al. (1994) compared attachments of infants raised in communal environments (collectivist cultures) with infants raised in family-based sleeping arrangements (individualist cultures). They found that attachments are culturally specific, meaning that Schaffer and Emerson's stages of attachment may not apply to collectivist cultures.

Schaffer and Emerson place a lot of importance on the primary attachment figure. This suggests that the infant forms one special attachment and other relationships come afterwards. However, Rutter (1995) has argued that all attachment figures are equivalent and they are all integrated to produce an infant's attachment type. This suggests that Schaffer and Emerson may have undervalued the importance of secondary attachments.

Extra AO3 material for 16-mark A Level answers

Another problem with Schaffer and Emerson's research is that the sample was biased. They used a working-class population in the 1960s. This means that the sample may not be representative of other social groups, and the results may not be relevant today. As this data was used to create their stage theory, this means that the theory may not be valid.

The data collected by Schaffer and Emerson may be unreliable because it was based on mothers' reports of their infants. Some mothers may have been less sensitive to their infants, but may not have reported their infant's behaviour very accurately. This would create a systematic bias in the results, which means that the data would be unreliable and the stage theory which is based on this data may be invalid.

Page 75 No. 3.3

1. Harlow (1959) created two wire mothers. One of these was covered in soft cloth. Eight infant rhesus monkeys were studied. For four of them, a milk bottle was on the cloth-covered mother and for four of them it was on the wire mother. Measurements were made of the amount of time each monkey spent with the two different ‘mothers’. Observations were also made of the monkey infants’ responses when they were frightened. All eight monkeys spent most of their time with the cloth-covered mother, whether or not this ‘mother’ had the feeding bottle. The monkeys who fed from the wire mother only spent a short amount of time getting milk, then returned to the cloth mother. When they were frightened, all the monkeys clung to the cloth-covered mother.

2. Lorenz (1935) took gosling eggs and divided them into two groups. One group was left with their natural mother and the other was placed in an incubator. When the incubator eggs hatched, the first living moving thing they saw was Lorenz. These goslings started following him around. Lorenz marked the two groups to distinguish them and placed them together. The goslings quickly divided themselves up, one group following their natural mother, the other group following Lorenz.

3. Animal studies, like Harlow’s, showed that attachment depends on reciprocal responsiveness. In Harlow’s study the motherless monkeys did not develop normally, even if they did have contact comfort. They were socially abnormal, freezing or fleeing when approached by other monkeys, and they were sexually abnormal, too. For example, they did not show normal mating behaviour and did not cradle their own children. This shows that these early attachment experiences had a long-term impact on the monkeys’ behaviour.

4. Lorenz (1935) took gosling eggs and divided them into two groups. One group was left with their natural mother and the other group was placed in an incubator. When the incubator eggs hatched, the first living moving thing they saw was Lorenz and they started following him around. Lorenz marked the two groups to distinguish them and placed them together. The goslings quickly divided themselves up, one group following their natural mother, the other group following Lorenz.

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cloth-covered mother, whether or not this ‘mother’ had the feeding bottle. The monkeys who fed from the wire mother only spent a short amount of time getting milk, then returned to the cloth mother. When they were frightened, all the monkeys clung to the cloth-covered mother.

One criticism of Lorenz’s idea of imprinting is that the original concept says there is an image stamped irreversibly on the nervous system. Now, we understand imprinting to be more flexible. Guiton (1966) found he could reverse the imprinting on chickens that had originally tried to mate with a rubber glove, so they mated with chickens. This shows that imprinting is no different from other types of learning and the effects are not irreversible, as Lorenz claimed.

Harlow’s research has some ethical issues because he experimented on monkeys. The study created lasting emotional harm as the monkeys had difficulty forming relationships later on. However, some psychologists argue that the experiment can be justified in terms of the significant effect it had on our understanding of attachment. This suggests that the benefits of animal research outweigh the costs.

The aim of animal studies is to generalise the conclusions to human behaviour; however, humans differ in important ways to animals. Harlow’s research has, however, been supported by Schaffer and Emerson, who found that infants do not always attach to the person who feeds them. This suggests that conclusions of these animal studies can be generalised to humans.

**Extra AO3 material for 16-mark A Level answers**

There are a number of studies that support the idea of imprinting in animals. Guiton (1966) demonstrated that leghorn chicks, exposed to yellow rubber gloves for feeding them during their first weeks, imprinted onto the gloves. This supports the view that young animals are not born with a predisposition to imprint onto a specific type of object, but probably only any moving thing that is present during the critical window of development. This supports Lorenz’s idea of imprinting.

One criticism of Harlow’s research is the lack of control of the two ‘mothers’. The two wire monkeys varied in more ways than just being cloth covered or not, as they also had different heads. Therefore, it could be that the cloth-covered monkey was preferred as it was more attractive. The two different heads could have acted as a confounding variable, suggesting that Harlow’s research may have lacked internal validity.

**Page 77 No. 3.4**

1. Classical conditioning says that the unconditioned stimulus is food, which produces the unconditioned response of pleasure. The infants’ mother is the neutral stimulus, and if any neutral stimulus is regularly and consistently associated with an unconditioned stimulus, it takes on the properties of this unconditioned stimulus and will produce the same response. So, the neutral stimulus now becomes a learned or conditioned stimulus and produces a conditioned response. The person who feeds the infant moves from being a neutral stimulus to being a conditioned stimulus. Just seeing this person gives the infant a feeling of pleasure (a conditioned response).

2. One criticism of learning theory as an explanation for attachment is that it suggests that food is the key element in the formation of attachment. There is strong evidence to show that feeding has nothing to do with attachment. A study conducted by Harlow showed that rhesus monkeys were most ‘attached’ to a surrogate mother that provided contact comfort, not food.

3. Classical conditioning says that the unconditioned stimulus is food, which produces the unconditioned response of pleasure. The infants’ mother is the neutral stimulus, and if any neutral stimulus is regularly and consistently associated with an unconditioned stimulus, it takes on the properties of this unconditioned stimulus and will produce the same response. So, the neutral stimulus now becomes a learned or conditioned stimulus and produces a conditioned response. The person who feeds the infant moves from being a neutral stimulus to being a conditioned stimulus. Just seeing this person gives the infant a feeling of pleasure (a conditioned response).
Dollard and Miller (1950) offered an explanation of attachment based on operant conditioning and drive-reduction theory. When an infant is hungry, there is a drive to reduce the accompanying discomfort. So, when an infant is fed, this drive is reduced and this produces a feeling of pleasure, which is called positive reinforcement. Food becomes the primary reinforcer and the person who supplies the food becomes a secondary reinforcer and source of pleasure in their own right. Attachments occur because the child seeks the person who supplies the reward.

One criticism of learning theory as an explanation for attachment is that it suggests that food is the key element in the formation of attachment. There is strong evidence to show that feeding has nothing to do with attachment. A study conducted by Harlow showed that rhesus monkeys were most ‘attached’ to a surrogate mother that provided contact comfort, not food.

Learning theory does have some explanatory power, however, because infants do learn through association and reinforcement, but food may not be the main reinforcer. It could be that attention and responsiveness from the caregiver are important factors that help form attachments. This shows that even though learning theory does not provide a complete explanation for attachment, it does have some value.

A second criticism of learning theory is that it is largely based on studies with non-human animals, such as Skinner’s research with pigeons. Behaviourists argue that humans are no different from other animals in how we learn. However, non-behaviourists argue that attachments are too complex to be explained by conditioning. This means that behaviourist explanations may lack validity because they present an oversimplified version of human behaviour.

Extra AO3 material for 16-mark A Level answers

Another problem for learning theory is that although drive theory was very popular in the 1940s, it is no longer used by psychologists. Drive theory can only explain a limited number of behaviours and cannot explain why some people engage in behaviours that do not reduce discomfort. This suggests that humans are not always motivated to reduce discomfort, so the underlying principles of drive theory are outdated.

A final problem with learning theory is that Bowlby’s theory may provide a better explanation of attachment. His theory can explain why attachments form, whereas learning theory can only explain how they form. Also, Bowlby’s theory outlines the benefits of attachment, which learning theory does not. This means that Bowlby’s theory provides a more complete explanation for attachment.

Page 79 No. 3.5

1. Monotropy is the idea that the one relationship the infant has with their primary attachment figure is of special significance in emotional development. This is often the infant’s biological mother, but it doesn’t have to be.

2. Bowlby says that attachment behaviour evolved because it serves an important survival function, because an infant who is not attached is less well protected. Parents must also be attached to their infant to ensure they are cared for and survive. Babies have an innate drive to become attached, and the critical period for attachment is around 3–6 months. Infants who do not have the opportunity to form attachments in this time seem to have difficulty forming attachments later. Social releasers, such as smiling, are important during the early months to ensure that attachments form as they elicit caregiving. Bowlby proposed that infants have one special emotional bond, which is the primary attachment relationship, and he calls this monotropy.

3. The Minnesota parent–child study followed participants from infancy to late adolescence and found continuity between early attachment and later emotional and social behaviour. Individuals who were classified as securely attached in infancy were rated highest for social competence later in childhood, and were more popular. This supports Bowlby’s continuity hypothesis because it shows a link between early and later attachments.

4. According to Bowlby, attachment behaviour evolved because it serves an important survival function because an infant who is not attached is less well protected. Parents must also be attached to their infant to ensure they are cared for and survive. Babies have an innate drive to
become attached and the critical period for attachment is around 3–6 months. Infants who do not have the opportunity to form attachments in this time seem to have difficulty forming attachments later. Social releasers, such as smiling, are important during this time to ensure that attachments form as they elicit caregiving.

Bowlby proposed that infants have one special emotional bond, which is the primary attachment relationship, and he calls this monotropy. The importance of monotropy is that an infant has one special relationship and forms a mental representation of this relationship, which is called the internal working model. The continuity hypothesis proposes that individuals who are strongly attached in infancy continue to be socially and emotionally competent in childhood and adulthood.

One strength of Bowlby’s theory is the idea that attachments are adaptive. The theory states that infants become attached during a critical period of 3–6 months of age, which is the same time they learn to crawl. It is therefore vital that infants form and maintain an attachment during this time, so that caregivers can protect them.

Another strength of Bowlby’s theory is that the idea of monotropy has research support. Prior and Glaser (2006) did a review of the research and found that the evidence points to the hierarchical model as suggested by Bowlby’s research. This model places emphasis on one central person being ‘higher’ than others, rather than focusing on multiple attachments. This supports the idea of monotropy in Bowlby’s theory.

One criticism of Bowlby’s theory is his idea of a critical period. Rutter et al. showed that a critical period is true to some extent, because it actually appears less likely that attachments will form after this period. However, it is not impossible to form an attachment outside of the critical period. This means that researchers now use the term ‘sensitive’ period, instead of a ‘critical’ period, suggesting that Bowlby’s original idea of a critical period isn’t completely true.

**Extra AO3 material for 16-mark A Level answers**

Bowlby’s theory says that one outcome of attachment is the effect it has on later relationships. The Minnesota parent–child study followed participants from infancy to late adolescence, and found continuity between early attachment and later emotional and social behaviour. Individuals who were classified as securely attached in infancy were rated highest for social competence later in childhood, and were more popular. This supports Bowlby’s continuity hypothesis because it shows a link between early and later attachments.

Another criticism of Bowlby’s theory comes from the temperament hypothesis. This proposes that infants who have an ‘easy’ temperament are more likely to become strongly attached because it is easier to interact with them. Belsky and Rovine (1987) found that infants between one and three days old who had signs of being more temperamentally difficult were later judged to be more likely to have developed an insecure attachment. This supports the temperament hypothesis and suggests Bowlby’s theory may not be the best explanation of attachment.

**Page 81 No. 3.6**

1. Secure attachment is a strong and contented attachment of an infant to their caregiver. Securely attached infants are comfortable with social interaction and intimacy, and secure attachment is related to subsequent healthy cognitive and emotional development.

2. The Strange Situation is conducted in an observation laboratory with video cameras to record the behaviour of mothers with their children. It consists of eight episodes, each designed to highlight certain behaviours, such as a willingness to explore, stranger anxiety, separation anxiety and behaviour at reunion with the caregiver. The key feature of these episodes is that the caregiver and stranger alternate stay with the infant or leave. This enables observation of the infant’s response to the novel environment, response to a stranger, separation from the caregiver, and reunion with the caregiver. Data is collected by recording what the infant is doing every 15 seconds and each item is also scored for intensity.
3. The Strange Situation aims to measure the attachment type of a child, but Main and Weston (1981) found that children behaved differently depending on which parent they were with. This suggests that the classification of an attachment type may not be valid because what we are measuring is one relationship, rather than a personal characteristic lodged in the individual. This means that the Strange Situation might be low in internal validity.

4. The Strange Situation is conducted in an observation laboratory with video cameras to record the behaviour of mothers with their children. It consists of eight episodes, each designed to highlight certain behaviours, such as a willingness to explore, stranger anxiety, separation anxiety and behaviour at reunion with the caregiver. The key feature of these episodes is that the caregiver and stranger alternately stay with the infant or leave. This enables observation of the infant’s response to the novel environment, response to a stranger, separation from the caregiver, and reunion with the caregiver.

Data is collected by recording what the infant is doing every 15 seconds and each item is also scored for intensity. Data is typically collected by a group of observers using a video recorder or one-way mirror. They may record what the infant is doing every 15 seconds using the following behavioural categories: (1) proximity and contact-seeking behaviours, (2) contact-maintaining behaviours, (3) proximity and interaction-avoiding behaviours, (4) contact and interaction-resisting behaviours, and (5) search behaviours. Each item is also scored for intensity on a scale of 1 to 7.

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A criticism of Ainsworth’s analysis comes from later research conducted by Main and Solomon (1986). They analysed over 200 Strange Situation videos and proposed a fourth insecure attachment type: disorganised attachment. These infants don’t have a consistent type of attachment, for example showing very strong attachment followed by avoidance. This shows that Ainsworth’s original claims from the Strange Situation research were too simplistic.

A strength of Ainsworth’s research is that it is reliable. Ainsworth et al. (1978) found an almost perfect inter-rater reliability of .94, which suggests high agreement among observers in terms of exploratory behaviour. This suggests that the Strange Situation is a reliable method of measuring attachment.

Extra AO3 material for 16-mark A Level answers

Ainsworth’s research can be used to improve children’s lives. In situations where disordered patterns of attachment develop, intervention strategies can be put in place to help. These teach caregivers to be more responsive to their infants and results show that this has changed infants’ attachment types for the better. This is a strength of the research.

Ainsworth’s research explanation that maternal sensitivity underlies secure attachment may be wrong. Ravel et al. (2001) have found low correlations between measures of maternal sensitivity and the strength of attachment. Slade et al. (2005) found that the ability to understand what someone else is thinking and feeling, rather than maternal sensitivity, may be the central mechanism in establishing attachment type.

Page 83 No. 3.7

1. Van Ijzendoorn and Kroonenberg (1988) conducted a meta-analysis of the findings from 32 studies of attachment behaviour. Altogether the studies examined over 2,000 Strange Situation classifications in eight different countries. Van Ijzendoorn and Kroonenberg were interested to see whether there would be evidence that inter-cultural differences did exist, and they were also interested to see if there were intra-cultural differences in the findings from studies conducted within the same culture.
When they looked at the variation between cultures or countries, Van Ijzendoorn and Kroonenberg found that the differences were small. Secure attachment was the most common classification in every country. Insecure-avoidant attachment was the next most common in every country, except Israel and Japan. With reference to variation within cultures, they found this was 1.5 times greater than the variation between cultures.

2. The meta-analysis by Van Ijzendoorn and Kroonenberg (1988) drew conclusions about cultural differences yet they actually were not comparing cultures, but countries. Within each country there are many different subcultures, each of which may have different childcare practices. One study of attachment in Tokyo found similar distributions of attachment types to the Western studies, whereas a more rural sample found an over-representation of insecure-resistant individuals. Van Ijzendoorn and Kroonenberg conclude that great caution should be exercised in assuming that an individual sample is representative of a particular culture.

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The conclusion to be drawn from this meta-analysis is that the global pattern across cultures appears to be similar to that found in the US. Secure attachment is the 'norm' – it is the most common form of attachment in all countries.

One issue with research into cultural variations in attachment is that similarities may not be innately determined. Bowlby’s theory states that the reason for universal similarities in how we form attachments is because it is innate. Van Ijzendoorn and Kroonenberg, however, suggest that some cultural similarities may be due to the effects of mass media, which spread ideas about parenting. This means that cultural similarities may be due to global culture, not an innate mechanism.

One problem with research conducted in different countries is the measures that are used. The Strange Situation assumes that willingness to explore is a sign of secure attachment, but this may not be the case in some cultures. In Japanese culture, dependence, rather than independence, would show secure attachment. This means that measures like the Strange Situation may lack validity in non-Western cultures.

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Extra AO3 material for 16-mark A Level answers

Another criticism of cross-cultural research into attachment is the cultural bias of attachment theory. Rothbaum et al. (2000) argue that the theory is rooted in American culture. They also found that the continuity hypothesis does not have the same meaning in Japan as it does in America. Bowlby and Ainsworth proposed securely attached children go on to be more socially competent as adults, but they consider ‘competent’ to be independent. In Japan, the opposite is true, showing that attachment research may not be relevant to other cultures.
One strength of cross-cultural research is the development of universal principles of attachment. Posada and Jacobs (2001) claim there is a lot of evidence supporting this idea. For example, China, Colombia and Germany all support the idea that maternal sensitivity leads to secure attachment. This means that even though the expressions of maternal sensitivity and behaviours found in securely attached infants may vary across cultures, the core concepts are universal.

**Page 85 No. 3.8**

1. Maternal deprivation refers to a loss of emotional care that is normally provided by a primary caregiver, specifically the mother. Bowlby proposed that prolonged emotional deprivation would have long-term consequences in terms of emotional development. Bowlby believed that a child who is denied maternal care because of frequent and/or prolonged separations may become emotionally disturbed, if it happens before the child is about two-and-a-half years old, and if there is no mother-substitute available.

2. Bowlby’s (1944) 44 juvenile thieves study involved analysing the case histories of a number of his patients in the Child Guidance Clinic in London where he worked. All the children attending the clinic were emotionally maladjusted. He studied 88 of these children – half had been caught stealing and the other half were a control group. Bowlby suggested some of the thieves were affectionless psychopaths as they lacked normal signs of affection, shame, or a sense of responsibility. Bowlby found that those individuals diagnosed as affectionless thieves had experienced frequent early separations from their mothers and 86% of the affectionless thieves experienced frequent separations compared with 17% of the other thieves. Almost none of the control participants experienced early separations. These findings suggest that early separations are linked to affectionless psychopathy. In other words, lack of continuous care may well cause emotional maladjustment or even mental disorder.

3. Bowlby said that prolonged emotional deprivation would have long-term consequences for emotional development. Bowlby didn’t think it was enough to make sure that children were well fed and kept safe and warm. He believed that infants and children needed a warm, intimate and continuous relationship with a mother, or a permanent mother substitute, to ensure continuing normal mental health.

Bowlby also said that a young child who is deprived of this care because of repeated, or prolonged, separation may become emotionally disturbed. However, it will only have this effect if it happens before about the age of two and a half years and if there is no substitute mother figure. He also thought there was a continuing risk up to the age of about five. This means that separation does not need to result in deprivation, but it is deprivation that can potentially cause long-term harm.

Bowlby’s claim that deprivation has the potential to cause long-term harm is supported by his study of the 44 juvenile thieves. He found that individuals diagnosed as affectionless thieves had experienced frequent early separations from their mothers. This suggests that lack of continuous care may well cause emotional maladjustment.

An important strength of Bowlby’s theory is its application to childcare practices. Before Bowlby’s research, children were separated from their parents when they spent time in hospital and visiting was discouraged. However, Bowlby’s research led to major social changes in the way children were cared for in hospitals.

However, one criticism of Bowlby’s theory is that psychological separation was not distinguished from physical separation. Radke-Yarrow *et al.* (1985) studied mothers who were severely depressed, and found that 55% of their children were insecurely attached, compared with only 29% in the non-depressed group. This shows that psychological separation, as well as physical separation, can also lead to deprivation.
Extra AO3 material for 16-mark A Level answers

Another criticism of Bowlby’s theory is that children’s individual differences are ignored. Bowlby et al. (1956) studied 60 children under four who had tuberculosis and experienced prolonged separation while in hospital. When these children were assessed as teenagers, there were no significant differences in terms of intellectual development. Bowlby suggests that those children who coped better may have been more securely attached, so more resilient. This shows that not all children are affected by emotional disruption in the same way.

Bowlby’s view of deprivation did not make clear whether the child’s attachment bond had formed but been broken, or had never formed in the first place. Rutter’s (1981) view of deprivation was that a lack of attachment bond, which he called privation, would have potentially far more serious consequences for the child than the loss of an attachment bond, which he called deprivation. This means there is a key distinction between the two, and a lack of clarity may affect the validity of research findings.

Page 87 No. 3.9

1. Rutter and Songua-Barke’s (2010) study included 165 Romanian children who spent their early lives in Romanian institutions and suffered from the effects of institutionalisation. Of these children, 111 were adopted before the age of 2 years and a further 54 by the age of 4. The adoptees have been tested at regular intervals (ages 4, 6, 11 and 15) to assess their physical, cognitive and social development and information has also been gathered in interviews with parents and teachers. Their progress has been compared to a control group of British children adopted in the UK before the age of 6 months.

   At the time of adoption, the Romanian orphans lagged behind their British counterparts on all measures of physical, cognitive and emotional development. By the age of four, some of the children had caught up with their British counterparts. This was true for almost all of the Romanian children adopted before the age of six months. Subsequent follow-ups have confirmed that significant deficits remain in a substantial minority of individuals who had experienced institutional care to beyond the age of six months. Many of those orphans adopted after six months showed disinhibited attachments and had problems with peer relationships.

2. Institutionalisation can cause physical underdevelopment and intellectual underfunctioning as well as disinhibited attachment. The effects of institutionalisation can also affect someone’s ability to look after their own children later in life.

3. Murray and Trevarthen (1985) conducted a study with two-month-old infants. The infants first interacted via a video monitor with their mother in real time. Later a video recording of the mother was replayed to the infants so that the image on the screen was not responding to the infant’s facial and bodily gestures. The researchers found that the infants became intensely distressed, and they tried to attract their mother’s attention, but when they didn’t get a response, they turned away. This shows that infants actively want to interact with their mother.

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One issue with this research is that children react differently. Some research shows that individuals who do not form a primary attachment in the sensitive period are unable to form attachments. However, this is not true of all children who experience institutionalisation, with some children not as strongly affected as others. Rutter suggested that it might be that some of the children did receive special attention in the institution, perhaps because they smiled more, and this would mean that they did have some early attachment experiences. This suggests that the findings of institutionalisation are not universal and some children can recover.

A strength of the research is the real-world application. Research into institutionalisation can improve children’s lives. The Romanian orphan research showed the importance of early adoption. In the past, mothers were encouraged to nurse their child for a significant period of time before giving them up for adoption. By this time, the sensitive period for attachment may have passed, making it difficult to form secure attachments. Today, most babies are adopted much earlier, and research shows adoptive mothers and children are just as securely attached as non-adoptive families.

The importance of these studies is that they followed the lives of children over many years. Such longitudinal studies take a lot of time which means a lot of planning and waiting for results, but the benefits are large. Without such studies we may mistakenly conclude that there are major effects due to early institutional care, whereas some of these studies show that the effects might disappear after sufficient time and with suitable high quality care.

**Extra AO3 material for 16-mark A Level answers**

One criticism is that the effects of institutionalisation do disappear over time if the children have good-quality emotional care. It could be that ex-institutional children need more time than normal to mature and learn how to cope with relationships. This is a criticism of the research because it implies the effects may be irreversible, which may not be true.

Another problem with research into institutionalisation is that emotional deprivation is only one factor. The Romanian orphans experienced appalling physical conditions, which affected their health, and a lack of cognitive stimulation which would also affect their development. This suggests researchers should be cautious when interpreting the effects of Romanian orphan studies.

**Page 89 No. 3.10**

1. Bowlby’s concept of the internal working model is a mental model of the world that relates to a person’s expectations about relationships based upon their earliest attachment relationship. An infant learns about a relationship from experience; they learn what relationships are and how partners in a relationship behave towards each other. It is an ‘operable’ model of the self and an attachment partner, based on their joint attachment history. It is called ‘operable’ because it is used to predict the behaviour of other people in the future.

2. Hazan and Shaver (1987) placed a ‘Love Quiz’ in the *Rocky Mountain News*. The quiz asked questions about current attachment experiences and attachment history to identify current and childhood attachment types. The questionnaire also asked questions about attitudes towards love, an assessment of the internal working model. The researchers analysed 620 responses, 205 from men and 415 from women. When analysing self-reports of attachment they found that the prevalence of attachment styles was similar to that found in infancy: 56% were classified as secure, 25% as avoidant and 19% as resistant. They also found a positive correlation between attachment type and love experiences. Securely attached adults described their love experiences as happy, friendly and trusting. There was also a relationship between the conception of love (the internal working model) and attachment type, with securely attached individuals tending to have a positive internal working model.

3. Research on the influence of early attachment suggests that very early experiences have a fixed effect on later adult relationships and, therefore, children who are insecurely attached at one year of age are doomed to experience emotionally unsatisfactory relationships as adults. However, researchers have found plenty of instances where participants were experiencing happy adult relationships despite not having been securely attached as infants.
The research linking the internal working model/early attachment with later relationships experience is correlational rather than experimental and therefore we cannot claim that the relationship between early attachment and, for example, later love styles is one of cause and effect. It is possible that both attachment style and later love styles are caused by something different, such as innate temperament.

4. Bowlby’s concept of the internal working model is a mental model of the world that relates to a person’s expectations about relationships based upon their earliest attachment relationship. An infant learns about a relationship from experience; they learn what relationships are and how partners in a relationship behave towards each other. It is an ‘operable’ model of self and attachment partner, based on their joint attachment history. It is called ‘operable’ because it is used to predict the behaviour of other people in the future.

Research has found that individuals who were classed as securely attached in infancy were highest rated for social competence in later childhood. This is because securely attached infants have higher expectations that others are friendly and trusting. Hazan and Shaver (1987) also found a link between early attachment type and later relationships.

Quinton et al. (1984) found a link between poor attachment and later difficulties with parenting. The lack of an internal working model means that individuals lack a reference point to subsequently form relationships with their own children.

Research on the influence of early attachment suggests that very early experiences have a fixed effect on later adult relationships and, therefore, children who are insecurely attached at one year of age are doomed to experience emotionally unsatisfactory relationships as adults. However, researchers have found plenty of instances where participants were experiencing happy adult relationships despite not having been securely attached as infants. This shows that the research does not suggest that an individual’s past unalterably determines the future course of their relationships.

A further problem is that the research linking the internal working model/early attachment with later relationships experience is correlational rather than experimental and therefore we cannot claim that the relationship between early attachment and, for example, later love styles is one of cause and effect. It is possible that both attachment style and later love styles are caused by something different, such as innate temperament.

A further weakness of this area of research is that most studies rely on retrospective classification of people’s early attachments. These recollections are likely to be flawed because our memories of the past are not always accurate. This is extremely important because if memories are inaccurate then the research findings will not be valid.

Extra AO3 material for 16-mark A Level answers

Not all research has found a strong positive correlation between early attachments and later relationships. Fraley (2002) reviewed 27 samples where infants were assessed in infancy and later reassessed (ranging from 1 month to 20 years later). He found correlations ranging from .50 to as low as .10. These do not suggest attachment type is very stable and therefore early experiences are unlikely to have a predictable outcome.

The internal working model says that early relationships affect later attachment types and this is why, for example, securely attached infants go on to have more positive relationships. Feeney (1999), however, argues that adult attachment patterns may be properties of the relationship, not the individual. For example, it is possible that a secure adult relationship causes the adult attachment type. This means that another explanation may account for the findings of early attachment research.
Some suggested answers to the ‘Can you?’ questions in the Fourth edition AS Complete Companion book are given here. Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Page 99 No. 4.1

1. Statistical infrequency defines abnormality as those behaviours that are extremely rare. If we can define what is most common (or is ‘normal’), then we also have an idea of what is not common (or is ‘abnormal’). For example, it is not the norm for a woman to have a first baby after the age of 40, or under the age of 20, so this behaviour would be defined as abnormal.

2. Social norms are standards of acceptable behaviour that are set by a particular social group. Anyone who deviates from these standards is considered abnormal according to the ‘deviation from social norms’ definition. For example, not laughing at a funeral is an implicit social rule, so people who do laugh at funerals would be considered abnormal.

3. One limitation of defining abnormality in terms of statistical infrequency is that some abnormal behaviour is actually desirable rather than undesirable. For example, very few people have an IQ over 150 but we would not want to suggest this is undesirable. This definition of abnormality does not distinguish between desirable and undesirable behaviour.

4. Statistical infrequency defines abnormality as those behaviours that are extremely rare. If we can define what is most common (or is ‘normal’), then we also have an idea of what is not common (or is ‘abnormal’). For example, it is not the norm for a woman to have a first baby after the age of 40, or under the age of 20, so this behaviour would be defined as abnormal.

Social norms are standards of acceptable behaviour that are set by a particular social group. Anyone who deviates from these standards is considered abnormal according to the ‘deviation from social norms’ definition. Some rules about unacceptable behaviour are implicit whereas others are policed by laws. For example, not laughing at a funeral is an implicit social rule, so people who do laugh at funerals would be considered abnormal. Causing a disorder in public is both a deviation from social norms and against the law. Another example of abnormal behaviour would be paedophilia. This is because it deviates from both an implicit social rule about behaviour and is also against the law.

One limitation of defining abnormality in terms of statistical infrequency is that some abnormal behaviour is actually desirable rather than undesirable. For example, very few people have an IQ over 150 but we would not want to suggest this is undesirable. This definition of abnormality does not distinguish between desirable and undesirable behaviour.

One limitation of the deviation from social norms definition is that social norms vary over time. Until fairly recently, homosexuality was considered to be a mental disorder. However, society’s norms have changed and homosexuality is now considered to be socially acceptable. This means that the deviation from social norms definition is based on society’s attitudes, which does not seem an appropriate way of defining abnormality.

Both of these definitions of abnormality are bound by culture. Classification systems, such as the DSM, are almost entirely based on the social norms of the dominant culture in the West (white and middle class) and yet the same criteria are applied to people from different subcultures living in the West. What may be abnormal in one culture may be completely normal in another. This means that there are no universal standards when it comes to defining abnormality.
Extra AO3 material for 16-mark A Level answers

Another problem with defining abnormality as statistically infrequent behaviour is that the cut-off points are subjectively determined. Not all people agree on what a normal amount of sleep is, for example. However, since it is a symptom of depression, it is important to know when a normal amount of sleep becomes an abnormal amount of sleep, if we are to make a diagnosis. This means that disagreements about cut-off points make it difficult to define abnormality in this way.

Deviance is related to a behaviour’s context. For example, wearing a bikini on a beach is normal, but wearing it to a formal dinner is abnormal. This may be harmless eccentricity and not an abnormal deviation, but it is often hard to tell. This limits the deviation from social norms definition because on its own it cannot offer a complete definition of abnormality, because it is inevitably related to context.

Page 101 No. 4.2

1. The failure to function adequately definition considers abnormality to be judged in terms of not being able to cope with everyday living. Not functioning adequately causes distress and suffering for the individual and it may cause distress to others, too.

2. One criterion of ideal mental health is autonomy. This means that you are able to be independent and self-regulating. Another criterion of ideal mental health is having mastery of the environment. This includes the ability to love, function at work and in interpersonal relationships, adjust to new situations, and solve problems.

3. One limitation of the ideal mental health definition of abnormality is that according to these criteria, most people are abnormal. This means that it is not a very useable definition when it comes to defining abnormality. Another limitation of this definition is that it suggests mental health and physical health are the same. Some mental disorders have physical causes, but many do not, so it is unlikely that we could diagnose mental abnormality in the same way we can diagnose physical abnormality.

4. The failure to function adequately definition of abnormality allows abnormal behaviour to be judged based on whether someone can cope with everyday living, such as going out to work. If a behaviour is not distressing to the individual and it is not distressing to others, then they are not, according to this definition, abnormal. Some disorders, such as schizophrenia, would be defined as abnormal because its symptoms are distressing to others around the schizophrenic, even if they are not to the schizophrenic themselves.

Jahoda (1958) defines abnormality as a deviation from ideal mental health. Absence of the criteria for positive mental health indicates abnormality and a potential mental disorder. Jahoda identified six characteristics of ideal mental health that enable an individual to feel happy and behave competently. These include being able to cope with stressful situations, personal growth and self-actualisation. They also require you to have an accurate perception of reality and mastery of your environment, which includes the ability to love, function at work and adjust to new situations.

One problem with the failure to function adequately definition of abnormality is that some behaviours people would consider abnormal can be functional. For example, being depressed may lead to extra attention for the individual. This attention is rewarding and therefore functional, even if it is generally regarded as abnormal. Therefore the failure to function adequately definition is an incomplete one.

Jahoda’s criteria are unrealistic, which limits deviation from ideal mental health as a definition for abnormality. Very few people satisfy the criteria all of the time. We also don’t know how many of these criteria would need to be absent before someone could be classed as abnormal. Therefore, everyone could be described as abnormal to some degree. If everyone could be described as abnormal under this definition, it does not help us to determine a genuine difference between normal and abnormal.
A limitation of both definitions of abnormality is that they are bound by the ideals and beliefs of one culture, more specifically, the dominant culture in the West. This means that if we try to apply either definition to non-Western cultures, we are likely to be wrong. This means that applying these definitions to non-Western cultures would be inappropriate.

Extra AO3 material for 16-mark A Level answers

However, defining abnormality as a failure to function adequately does at least recognise the subjective experience of the patient, which allows us to view a mental disorder from the point of view of those who experience it. Also, a failure to function adequately is fairly easy to judge objectively, because we can list behaviours which would be considered as functioning adequately and so we can judge abnormality objectively. This means that we can be more accurate in our diagnosis of abnormality.

A major problem with the ideal mental health definition of abnormality is that it suggests mental health is the same as physical health. Most of the time, physical illnesses have physical causes which makes them reasonably easy to diagnose. Mental disorders do not always have a physical cause, and are often a result of life experiences. This means that it is not really possible to diagnose mental abnormality in the same way that we diagnose physical abnormality.

Page 103 No. 4.3

1. One behavioural characteristic of phobias is avoidance. When a person is faced with the object or situation that creates fear, the immediate response is to try and avoid it. Alternatively people will freeze or even faint when they experience the thing they are scared of.

2. Sadness is one emotional characteristic of depression, along with feeling empty. Depressives may feel worthless, have a loss of interest and pleasure in their usual hobbies and activities, and believe they have a lack of control.

3. The behavioural characteristics of OCD are repetitive compulsive behaviours or mental acts performed to reduce anxiety. The cognitive characteristics are recurrent, intrusive thoughts or impulses that are perceived as being inappropriate or forbidden.

4. The primary emotional characteristics of phobias is fear that is marked and persistent, and is likely to be excessive and unreasonable. Phobics also feel anxious and panic when they experience the thing they are scared of. The main emotional characteristic of OCD is anxiety and distress, which the obsessions and compulsions cause. Sufferers are aware that their behaviour is excessive and this causes feelings of embarrassment and shame.

Page 105 No. 4.4

1. The first stage of the two-process model is classical conditioning. If an initially neutral stimulus (such as a wasp) is paired with an unconditioned stimulus that produces an unconditioned response of fear (such as being stung), then the neutral stimulus will become a conditioned stimulus and produce fear as a conditioned response whenever it is presented. The second stage in the model is operant conditioning. If fear is lowered by avoiding the phobic stimulus, avoidance behaviour becomes a negative reinforcer.

2. The unconditional stimulus (UCS) of pain produces the unconditional response (UCR) of fear. If an initially neutral stimulus (NS), such as a dog, is paired with the UCS of pain, the UCR of fear is produced. This association leads to the dog becoming a conditioned stimulus (CS) and fear is a conditioned response (CR).

3. One criticism of the two-process model is that it ignores cognitive factors. Phobias may develop as the consequence of irrational thinking. For example, a person who has irrational thought when in a certain situation might become extremely anxious and this could trigger a phobia.

4. Mowrer proposed the two-process model to explain how phobias are learned. The first stage is classical conditioning, which says that we learn phobias by association. We associate a neutral stimulus with an unconditioned stimulus, which then leads to a new association being learned. For
example, if our unconditioned stimulus is the sound of a metal bar being struck, this leads to an unconditioned response of fear. If we pair the unconditioned stimulus with a neutral stimulus of a white rat, then we will learn to associate the sound of the metal bar being struck with the rat. This means that the rat becomes the conditioned stimulus, leading to a conditioned response of fear.

The second stage is operant conditioning. The likelihood of a behaviour being repeated is increased if the outcome is rewarding. In the case of a phobia, the avoidance of (or escape from) the phobic stimulus reduces fear and is thus reinforcing. This is an example of negative reinforcement (escaping from an unpleasant situation). The individual avoids the anxiety created by, for example, the dog or social situation by avoiding them entirely.

One strength of the behavioural approach is that some people can recall a specific event that led to their phobia developing. For example, Sue et al. (1994) found that agoraphobics are most likely to explain their phobia in terms of a specific event. This shows that classical conditioning can be involved in the development of phobias. However, one limitation of the two-process model is that it does not explain the development of all phobias. For example, some people cannot remember an incident occurring that led to their phobia developing. This suggests that different phobias may be the result of different processes. However, Öst says it’s possible that such traumatic events did actually happen, but the phobic has forgotten them.

Another strength of the behavioural approach is the support for social learning. In an experiment by Bandura and Rosenthal (1966) a model acted as if he was in pain every time a buzzer sounded. Later on, those participants who had observed this showed an emotional reaction to the buzzer, demonstrating an acquired ‘fear’ response.

Another limitation of the two-process model is that a phobia does not always develop after a traumatic incident. For example, Di Nardo et al. (1988) found that not everyone who is bitten by a dog develops a phobia of dogs. The diathesis-stress model says we inherit a genetic vulnerability for developing mental disorders, but this will only become apparent if it is triggered by a life event, such as being bitten by a dog. This suggests a dog bite will only lead to a phobia in people with this vulnerability.

**Extra AO3 material for 16-mark A Level answers**

One problem with explaining phobias as a learned behaviour is that it ignores the cognitive aspects of the phobia’s development. For example, a person who thinks that they might die if they get trapped in a lift may become extremely anxious and this may trigger a phobia of lifts. This shows that irrational thinking is also involved in the development of phobias, and could explain why cognitive therapies can be more successful than behaviour therapies in treating phobias.

Instead of a behavioural approach on its own, a better explanation for the development of phobias may be biological preparedness. Seligman argues that animals are genetically prepared to learn associations between fear and stimuli that were life-threatening in our evolutionary past. It would have been adaptive to learn to avoid these things. This would explain why fear is easier to condition to some things than others. If phobias were acquired through classical conditioning, then a fear response to any stimulus should be conditioned. The fact that this does not occur means that behavioural explanations alone cannot explain the development of phobias.

**Page 107 No. 4.5**

1. Systematic desensitisation (SD) uses counterconditioning to replace fear with relaxation. Phobics learn a relaxation technique. After this, they are asked to imagine scenes with the phobic stimulus. These are rated for anxiety, and a hierarchy from least to most feared is constructed. The phobic then imagines the least feared scene whilst simultaneously relaxing. When no anxiety is experienced, fear has been desensitised. The procedure is then repeated with the next scene in the hierarchy, and the treatment ends when the phobic can imagine the most feared scene without experiencing any anxiety.
2. Flooding involves a single exposure to the person's most feared situation with the phobic object. As in systematic desensitisation, the first step is to learn relaxation techniques. These techniques are then applied in one session, which usually lasts two to three hours. The procedure can be conducted in vivo, which means that the person actually experiences exposure to the phobic stimulus. Alternatively, virtual reality can be used. The adrenaline released when the fear response occurs has a time limit. As adrenaline levels naturally decrease, a new stimulus-response link is learned between the feared stimulus and relaxation.

3. One advantage of flooding is that it does not require a hierarchy of feared responses to be constructed. Instead, the therapy involves exposing the phobic to the most feared situation. This means that the therapy involves less time, and is therefore less expensive than systematic desensitisation.

4. Systematic desensitisation (SD) uses counterconditioning to replace fear with relaxation. In this therapy, the phobics learn relaxation techniques, which mean that they can relax on command. With the therapist, they imagine scenes with the phobic stimulus and rate them for anxiety, creating a desensitisation hierarchy, from the least to the most feared. The phobic will start with the least feared scene while relaxing at the same time. When they no longer feel anxious, the fear has been desensitised. They then work their way up the hierarchy.

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One strength of SD is that it is successful in treating a wide range of phobias. For example, McGrath et al. (1990) reported that about 75% of phobics respond to SD. However, the success of SD appears to depend on actual contact with the feared stimulus. Therefore, SD is more effective if it is used in vivo, rather than using pictures or imagining the feared stimulus.

Although flooding is a very effective way of treating phobias, it is not always the best way of treating them. This is because it can be highly traumatic for the client. The client is made aware of this before the therapy begins. However, that doesn’t necessarily mean that the client will be able to cope. Therefore, for at least some people, other therapies may be a better way to treat their phobias.

For those patients who do choose flooding as a treatment and do stick with it, it appears to be an effective, and relatively quick, treatment. For example, Choy et al. (2007) reported that both SD and flooding were effective but flooding was the more effective of the two at treating phobias. On the other hand, another review (Craske et al., 2008) concluded that SD and flooding were equally effective in the treatment of phobias.

Extra AO3 material for 16-mark A Level answers

Being able to be relaxed in the presence of a phobic stimulus may be less important than being able to cope with it. Klein et al. (1983), for example, found that supportive psychotherapy was just as effective as systematic desensitisation in treating social or specific phobias. This shows that cognitive factors are much more important than the behavioural approach suggests.

Although behavioural therapy removes the symptoms of a phobia, this does not mean that it removes the cause of the phobia. Symptoms may resurface in another form if the cause remains. Freud (1909) believed that the real cause of a phobia is projected onto another object because the phobia cannot be directly expressed. The psychodynamic approach emphasises the importance of treating the underlying cause of a phobia, and so it may be better than behavioural approaches to therapy.
1. Ellis created the ABC model to explain depression. A is an activating event which happens in someone's life, B is the belief about why that event happened, and C is the consequence of that belief. If the belief is irrational then it will lead to negative emotions like depression. These irrational beliefs come from musturbatory thinking, which means thinking that certain assumptions must be true if someone is to be happy. If you hold these musturbatory thoughts, you are likely to be disappointed or even depressed.

2. Beck's cognitive explanation for depression sees the roots of the disorder as lying in traumatic childhood experiences, such as continual parental criticism and/or rejection by others. These experiences lead to negative cognitive schemas developing, such as expecting to fail in situations similar to those present when the schemas were learned. These expectations lead to depression. Negative schemas and biases maintain what Beck calls the negative triad, a pessimistic and irrational view relating to the self, the world, and the future.

3. One criticism of Ellis' ABC model is that not all irrational beliefs are, in fact, irrational but may only seem to be like that. For example, Alloy and Abrahamson (1979) found that depressed people actually gave more accurate estimates of the likelihood of disaster than non-depressed people. This suggests that depressive realists tend to see things as they are rather than as they would like them to be.

4. The cognitive approach explains depression as being a result of irrational thinking. Beck's cognitive explanation for depression sees the roots of the disorder as lying in traumatic childhood experiences, such as continual parental criticism and/or rejection by others. These experiences lead to negative cognitive schemas developing, such as expecting to fail in situations similar to those present when the schemas were learned. These expectations lead to depression. Negative schemas and biases maintain what Beck calls the negative triad, a pessimistic and irrational view relating to the self, the world, and the future.

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The cognitive approach is supported by research that shows a link between irrational thinking and depression. For example, Hammen and Kranz (1976) found that depressed participants made more errors in logic when asked to interpret written material than did non-depressed participants. However, the fact that there is a link between negative thoughts and depression does not mean we can be sure that irrational thinking causes depression. It could be that depression leads to irrational thinking.

A strength of the cognitive explanation for depression is that it focuses on the person, and it gives them both the responsibility for their disorder and the opportunity to change their thinking. However, a weakness is that it tends to ignore situational factors, such as life events, which might have contributed to the depression. Instead it says that the disorder is all in the person's head and to recover they have to change how they think about the situation, not the situation itself.

The cognitive approach to depression has useful real-life applications, for example, through the use of therapy. Beck's and Ellis' theories have both been used to create therapies, such as CBT. This therapy has been found to be the best treatment for depression, so if depression is successfully treated by challenging irrational thoughts, then irrational thoughts are probably a cause of depression.
Extra AO3 material for 16-mark A Level answers

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Another problem is that, as well as cognitive factors, it is very likely that genetic factors and neurotransmitters are involved in depression. Research has shown that depressed people have lower levels of serotonin. This means that neurotransmitters also play a role in causing depression, and so a diathesis-stress model could be a better explanation for depression rather than cognitive or biological explanations on their own.

Page 110 No. 4.7

1. CBT aims to turn irrational thoughts into rational thoughts, and resolve emotional and behaviour problems. Ellis' version is called REBT and focuses on challenging or disputing irrational thoughts and replacing them with effective rational beliefs that produce new feelings. Effective disputing changes self-defeating beliefs into more rational beliefs. Clients complete homework assignments between therapy sessions.

2. Logical, empirical, and pragmatic disputing are ways of challenging irrational thoughts and beliefs and replacing them with more rational ones. For example, empirical disputing involves challenging a self-defeating belief that may not be consistent with reality, and involves asking questions like 'Where is the proof that your belief is accurate?' The aim of this is to change self-defeating beliefs into more rational beliefs. This helps clients feel better and become more self-accepting.

3. One criticism of cognitive-behavioural therapy as a treatment for depression is that it appears to be less suitable for people who have high levels of irrational beliefs that are both rigid and resistant to change. Ellis says that CBT is not suitable for everyone – some people simply do not want the direct sort of advice that therapists tend to give them.

4. Cognitive-behavioural therapy (CBT) is based on the view that the way we think about things has an impact on how we feel about things, and the therapy identifies, and challenges, this irrational thinking. Ellis' CBT is known as ‘rational emotional behaviour therapy’ (REBT) because the therapy tries to resolve behaviour problems, too.

   REBT focuses on challenging the irrational beliefs that lead to depression and tries to replace them with effective rational beliefs, which produce new feelings. The therapist may question the logic of the thinking, which is known as logical disputing, or they may ask for evidence that this belief is an accurate one. Throughout the therapy sessions, the therapist will give the client unconditional positive regard, which helps the client to feel able to change their beliefs and attitudes.

After several sessions of CBT, the client can move from catastrophising events to interpreting them more rationally. Between therapy sessions, clients are asked to complete homework tasks, which involve testing these irrational beliefs in their own lives and putting new rational beliefs into practice.

One strength is that research shows that Ellis' REBT is effective in treating people with depression. Ellis himself claimed a 90% success rate over 27 sessions, and when Cuijpers et al. (2013) reviewed 75 studies, they found that CBT was superior to no treatment. According to Ellis, the main reason why REBT is not always successful is because some clients do not put their revised beliefs into action.

However, a weakness of CBT is that it appears to be less suitable for people who have high levels of irrational beliefs that are both rigid and resistant to change. CBT also appears to be less suitable in situations where high levels of stress in the individual reflect realistic stressors in the person's life that therapy cannot resolve.
The cognitive approach’s claim that changing people’s behaviour can go some way to treating their depression is also supported by research into the beneficial effects of exercise. For example, Babyak *et al.* (2000) found that antidepressant drugs, aerobic exercise or both can treat depression effectively. However, the relapse rate was different and people were more likely to relapse following drug treatment than exercise treatment, showing that changing behaviour can be beneficial in treating depression.

**Extra AO3 material for 16-mark A Level answers**

CBT requires commitment and effort if it is to be effective. Ellis, for example, found that for depression to be effectively treated, 27 sessions of REBT were required. Cuijpers *et al.* (2013) found that CBT is especially effective if it is combined with drug therapy, suggesting that clients who are unable to cope with CBT’s demands may cope better if they have drug therapy, too.

Although cognitive approaches to therapy are popular, research suggests that there isn’t actually much difference between psychotherapies’ effectiveness. Luborsky *et al.* (2002) reviewed over 100 studies that compared different therapies. They found that there were only small differences between them in terms of their effectiveness. One possible reason for this is that different psychotherapies share common factors, such as being able to talk to a sympathetic person and having an opportunity to express your own thoughts.

**Page 113 No. 4.8**

1. The genetic approach to explaining OCD says that the disorder is inherited. The COMT gene regulates dopamine production. One form of this gene is more common in people with OCD than those without the disorder. The SERT gene may also be involved in OCD. A mutation of this gene has been found in two unrelated families where six of the seven members had OCD.

2. The orbitofrontal cortex (OFC) of the frontal lobes and the caudate nucleus part of the basal ganglia are thought to be abnormal in people with OCD. Serotonin plays a key role in the operation of these structures. Low serotonin levels may cause the areas to malfunction. Additionally, damage to the caudate nucleus might fail to suppress minor ‘worry’ signals from the OFC, creating a ‘worry circuit’ that is experienced as recurrent and intrusive thoughts or impulses.

3. One criticism of genetic explanations for OCD is that the evidence for them is unclear. For example, although there is a higher concordance rate for OCD in identical than non-identical twins, the concordance rate for identical twins is less than 100%. This means that environmental factors must also play a role in OCD.

4. Obsessive compulsive disorder (OCD) may be a genetic disorder. This means that some people might inherit from their parents a specific gene or genes that are related to the onset of OCD. One of these genes is the COMT gene, which regulates the production of dopamine. One form of the COMT gene has been found to be more common in OCD patients, and in these patients, there is lower activity in the COMT gene and there are higher levels of dopamine.

The other gene that may contribute to OCD is the SERT gene, which affects the way serotonin moves around the brain, so people with OCD have less serotonin. Ozaki *et al.* (2003) found a mutation of this gene in two unrelated families where six out of seven family members had OCD.

OCD may also be the result of biochemical abnormalities in the brain or brain damage. For example, it has been suggested that low levels of serotonin are a cause of OCD. This claim is based on the finding that when people with OCD are given antidepressants, which increase serotonin, their symptoms are reduced. Damage to the caudate nucleus, which is located in the basal ganglia, fails to suppress minor ‘worry’ signals from the orbitofrontal cortex. This means that a ‘worry circuit’ is formed, leading to obsessive and compulsive behaviours.

Family studies support the idea that genes play a role in OCD. Nestadt *et al.* (2000) found that people with a first-degree relative with OCD are more at risk of developing the disorder themselves. However, a problem with this research is that families also share environments, so it could be that the environment rather than genes is the cause of OCD.
Twin studies also support the role of genetic factors in OCD. Billett et al. (1998) found that MZ twins have a higher concordance rate for OCD than DZ twins. However, because the concordance rate is not 100%, this means that the environment must play a role in the onset of OCD.

Further support for biological explanations of OCD come from brain scans, which indicate that patients with OCD show heightened activity in their orbitofrontal cortex. This happens if the scans are taken while their OCD is active, such as someone with a germ obsession holding a dirty cloth. This suggests that obsessional thinking might be caused by damage to the brain circuits.

Extra AO3 material for 16-mark A Level answers

Research shows that there is a genetic link to abnormal neurotransmitter levels. In key brain regions, such as the orbitofrontal cortex, people with OCD have reduced grey matter and so do their very close relatives. Menzies et al. (2007) suggested that people’s risk of developing OCD could be detected by brain scans. This shows that differences in brain structure are inherited and these different brain structures may lead to OCD in some people.

Although there is some support for the biological approach to explaining OCD, it could be that psychological explanations are even better. For example, the two-process model is an explanation based on the behavioural approach that is supported by a large amount of research. Additionally, cognitive treatments for OCD are highly effective. This suggests that it might be better to concentrate on trying to explain OCD’s causes in psychological rather than biological terms.

Page 115 No. 4.9

1. OCD can be treated using SSRI antidepressants, such as Prozac. These block the re-uptake of serotonin in the pre-synaptic membrane, increasing serotonin concentration at receptor sites on the post-synaptic membrane. The effect of this is to reduce the anxiety associated with OCD. This anxiety can also be reduced using tricyclic antidepressants and benzodiazepine anti-anxiety drugs.

2. One criticism of the biological approach to treating OCD is that drugs have unpleasant side effects. For example, SSRIs cause nausea, headaches, and hallucinations, whilst the tricyclic antidepressants cause hallucinations and irregular heartbeat. This can lead to people choosing to stop taking the drugs.

3. There are several types of drugs that can be used to treat OCD. One of these is an SSRI, which works by acting on the person’s serotonin levels. In OCD, serotonin levels are low, and so if we give OCD patients drugs that increase serotonin then their behaviour should change, becoming less obsessive or compulsive. SSRIs also reduce the anxiety in OCD. Serotonin re-uptake is inhibited by these drugs and therefore there is more serotonin in the synaptic gap between neurons and consequently an increase in serotonin at the receptor sites.

Other drugs used to treat OCD are the tricyclic antidepressants. These work by acting on both serotonin and noradrenaline, and inhibit the receptor sites, so more of these neurotransmitters stay in the synaptic gap. However, as there are more side effects with tricyclics, these drugs are only used when SSRIs are not effective.

Instead of antidepressants, OCD is sometimes treated with anti-anxiety medication, such as benzodiazepines (BZs). These slow down the activity of the central nervous system by reacting with GABA receptors on the outside of the receiving neuron. This makes it harder for the neuron to be stimulated by other neurotransmitters. The neuron’s activity is slowed down, causing feelings of relaxation.

One strength of drug therapy is that there is evidence for its effectiveness in treating OCD. For example, Soomro et al. (2008) found that drugs were more effective than placebos in reducing symptoms up to three months after treatment. However, this means that we can only know about the short-term effectiveness of drug therapy and so we actually know very little about the long-term effectiveness of drugs.
Another strength of drug therapy is that it requires little input or effort from the user. All the user has to do is take the medication. Other therapies, such as CBT, are expensive and time consuming, but drug therapy is much quicker and easier, as well as being much more economical for the health service.

The main problem with drug therapy, however, is that the drugs have unpleasant side effects. For example, SSRIs cause nausea, headaches, and hallucinations, whilst the tricyclic antidepressants cause hallucinations and irregular heartbeat. This can lead to people choosing to stop taking the drugs, which limits their usefulness as treatments for OCD.

Extra AO3 material for 16-mark A Level answers

Another problem with drug therapy is that drugs are not a lasting cure for people with OCD. In the short term, the drugs are effective, but if patients stop taking the drugs, then they relapse within a week, according to Maina et al. (2001) This suggests that the drugs are not effective in the longer term and psychological therapies, such as CBT, should be used instead.

A further problem relates to a publication bias. Turner et al. (2008) found that studies showing positive results were more likely to be published in journals. Also, drug companies often fund the research and they have a strong interest in the continuing success of drugs. Therefore, selective publication of research may lead doctors to make inappropriate decisions about treating OCD with drugs.

Chapter 5

Some suggested answers to the ‘Can you?’ questions in the Fourth edition AS Complete Companion book are given here. Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Page 125 No. 5.1

1. Wundt’s approach involved him studying only those aspects of behaviour that could be strictly controlled under experimental conditions. His aim was to study the structure of the human mind, and he believed that the best way to do this was to break down behaviours, such as sensation and perception, into their basic elements. Because of this, his approach was referred to as ‘structuralism’. Wundt developed the technique of ‘introspection’. This is how people gain knowledge about their own mental and emotional states.

2. Wundt’s approach relied on non-observable responses. While participants could report on their conscious responses, the processes themselves, like memory and perception, were considered to be unobservable constructions. Wundt’s approach ultimately failed because of the lack of reliability of his methods. Introspective ‘experimental’ results could not be reliably produced by other researchers in other laboratories.

3. Introspection is the process by which a person gains knowledge about their own mental and emotional states. Our introspective ability allows us to observe our inner world. Wundt claimed that, with sufficient training, mental processes such as memory and perception could be observed systematically as they occurred, using introspection. For example, observers might be shown an object and asked to reflect on how they were perceiving it. This information could then be used to gain insight into the nature of the mental processes involved in perception.

4. First, introspection is not particularly accurate. We have very little knowledge of the processes underlying our beliefs and attitudes or what causes them. Second, Wundt’s methods lacked reliability. Introspective experimental results were not reliably reproducible by other researchers in other laboratories.
5. The scientific approach is based on empiricism, which is the belief that knowledge comes from observation and experience alone, rather than being innate. The scientific approach to psychology was based on two major assumptions. First, all behaviour is seen as being caused (the assumption of determinism) and second, if behaviour is determined, then it should be possible to predict how human beings would behave. The scientific method uses investigative methods that are objective, systematic and replicable. It is objective in that researchers do not let preconceived ideas or biases influence the collection of their data, and systematic in that observations or experiments are carried out accurately and with due consideration for the possible influence of other factors on the results. Observations can be repeated by other researchers to determine whether the same results are obtained.

6. One strength of the scientific approach in psychology is that it relies on objective and systematic methods of observation. This means that the knowledge acquired using the scientific method is more than just a passive acceptance of the facts. One limitation of the scientific approach in psychology is that much of the subject matter in psychology is unobservable. This means that it cannot be measured with any degree of accuracy. A lot of psychology is inferential, so there is a gap between the actual data obtained in research investigations and the theories put forward to explain these data.

Page 127 No. 5.2

1. Classical conditioning is a form of learning in which a neutral stimulus (such as the sound of a bell) is consistently paired with an unconditioned stimulus (such as food). It eventually takes on the properties of this stimulus and is able to produce a conditioned response (in this case salivation). This conditioned response is not an ordinarily occurring response to the sound of a bell.

Operant conditioning is learning through reinforcement and punishment. If a behaviour is followed by a desirable consequence then that behaviour is more likely to occur again in the future. However, if a behaviour is followed by an undesirable consequence then it is less likely to occur in the future.

2. Pavlov found that animals can learn to associate a stimulus that does not ordinarily produce a particular response if that stimulus is paired with another stimulus that does produce that response. For example, the sound of a bell (a CS) does not ordinarily produce salivation in a dog. However, the sight of food (a UCS) does produce salivation (a UCR). Repeated pairing of the CS and UCS leads to the CS eventually producing the UCR. When this happens, the UCR becomes a ‘conditioned response’ (CR). Pavlov called this form of learning classical conditioning. Once an animal has been classically conditioned, it will also respond to other stimuli which are similar to the one it was originally conditioned to. Pavlov called this ‘stimulus generalisation’. Pavlov discovered that, unlike the UCR, the CR does not become permanently established as a response. After a few presentations of the CS in the absence of the UCS, it loses its ability to produce the CR. This is called ‘extinction’.

3. Positive reinforcement occurs when a behaviour produces a consequence that is satisfying or pleasant. For example, food given to a hungry animal or praise given to a child after they do something particularly well are both effective positive reinforcers. Negative reinforcement removes something aversive (unpleasant) and so restores the organism to its ‘pre-aversive’ state. For example, the act of hitting the ‘off’ button on an alarm clock allows a person to escape from the unpleasant ringing and restores the restful pre-alarm state.

4. Skinner found that organisms spontaneously produce different behaviours and these behaviours provide consequences for that organism, some of which may be desirable and some undesirable. Whether or not an organism repeats a particular behaviour depends on the nature of these consequences. If the consequences are desirable, the behaviour is repeated. However, if the consequences are undesirable, the behaviour is suppressed. Skinner also found that although continuous reinforcement of a particular behaviour is most effective in establishing a particular response, partial reinforcement of a behaviour is more effective in maintaining that response and avoiding extinction. Punishment after a behaviour decreases the likelihood of that behaviour recurring.
5. One strength of the behaviourist approach is that classical conditioning has led to the development of treatments for the reduction of anxiety associated with various phobias. For example, systematic desensitisation is a therapy based on classical conditioning and this approach has been found to be effective for a range of phobias, including arachnophobia and aerophobia. One limitation of the behaviourist approach is that Skinner’s research was done with non-human animals rather than humans. Critics argue that humans have free will rather than having their behaviour determined by positive and negative reinforcement, and therefore that Skinner’s research can tell us little about human behaviour.

6. The behaviourist approach focuses on observable events, and behaviourists believe that much of human behaviour can be explained in terms of a basic form of learning known as conditioning, which involves the formation of learned associations between stimuli in the environment and an organism’s responses.

In classical conditioning, the natural stimulus in any reflex is referred to as the unconditioned stimulus (UCS) and the natural response to this stimulus is the unconditioned response (UCR). During the acquisition phase, a neutral stimulus (NS), which does not elicit the UCR, is presented shortly before the UCS. After many pairings of the NS and the UCS, this changes and now the NC is able to produce the same response in the absence of the UCS. The NS is now referred to as the conditioned stimulus (CS) and the response it produces is called the conditioned response (CR).

Operant conditioning is a form of learning in which the consequences of a behaviour are the determining factor. Some behaviours have desirable consequences (e.g. praise), whereas others have undesirable consequences (e.g. being told off). If a behaviour has desirable consequences, the behaviour is ‘reinforced’, and we will be more likely to repeat that behaviour in the future. Positive reinforcement occurs when a behaviour produces a desirable consequence while negative reinforcement works because it removes something unpleasant. If a behaviour has undesirable consequences, the behaviour is ‘punished’, and we will be less likely to repeat that behaviour in the future.

A problem for this explanation is that as different species face different challenges, they have different capabilities to learn through classical conditioning. This means that the relationship between the UCS and the CS tend to be more difficult to establish for some species than others. This might be better explained by ‘preparedness’. Animals are prepared to learn associations that are significant in terms of their survival needs but unprepared to learn associations that aren’t.

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Extra AO3 material for 16-mark A Level answers

A strength of Skinner’s research was his reliance on the scientific method. This means that he used controlled conditions in an attempt to discover a possible causal relationship between variables. This allowed him to establish a cause-and-effect relationship between the consequences of a behaviour (i.e. positive or negative) and the future frequency of its occurrence.

It has been claimed that the behaviourist approach ignores other levels of explanation, such as those that emphasise the importance of cognitive factors. By treating humans as a product of their conditioning alone, we ignore evidence for the role of these other factors in shaping behaviour. However, Skinner rejected this claim, arguing that these internal states are scientifically untestable. He argued that even complex behaviours, such as our interactions with the opposite sex, can be better understood by studying people’s reinforcement histories.
1. Imitation is the action of using someone or something as a model and copying their behaviour. Whether a behaviour is imitated or not depends on the characteristics of the model and the observed consequences of the behaviour.

Modelling is a form of learning in which individuals learn a particular behaviour by observing another individual performing that behaviour. This individual (model) can be, for example, a parent, a teacher, or a character on TV.

Vicarious reinforcement is learning that is not a result of direct reinforcement of behaviour, but happens through observing someone else be rewarded for that behaviour. Individuals learn about the likely consequences of an action and then make judgements as to the likelihood of experiencing these outcomes themselves.

Mediational processes refer to the internal mental processes that exist between environmental stimuli and the response made by an individual to those stimuli. For social learning to take place, the observer must form mental representations of the behaviour the model displays and the probable consequences of that behaviour in terms of expectancies of future outcomes.

2. Bandura found that children who observed a model behaving aggressively towards a Bobo doll reproduced a good deal of physically and verbally aggressive behaviour resembling that of the model. Children who observed a non-aggressive model exhibited virtually no aggression towards the Bobo doll. About one-third of the children who observed the aggressive model repeated the model's verbal responses, while none of the children who observed the non-aggressive model made verbally aggressive remarks. Children who saw the model being rewarded for aggressive acts were more likely to show a high level of aggression in their own play.

3. Social learning says that new patterns of behaviour can be acquired by observing someone else’s behaviour. In order for social learning to take place, someone must model the behaviour to be learned. This model can be a live model, such as a parent or a peer, but it can also be a symbolic model, such as someone portrayed in the media. Much of what a child learns is acquired through imitation of behaviour that is modelled by parents, and research on imitation has shown that whole patterns of behaviour can be rapidly acquired. The key determinants as to whether a behaviour is imitated are the characteristics of the model, the observer’s perceived ability to perform that behaviour and the observed consequences of that behaviour.

Bandura found that children who observed a model being rewarded for aggressive behaviour were much more likely to imitate that behaviour than children who had observed the model being punished for the same behaviour. Bandura called this vicarious reinforcement, that is, individuals learn about the likely consequences of an action and then adjust their subsequent behaviour accordingly. For social learning to take place, the observer must form mental representations of the behaviour displayed by the model and the probable consequences of that behaviour. So, an individual might display the learned behaviour in future, provided that the expectation of positive consequences is greater than the expectation of negative consequences.

One strength of social learning theory is that it has useful real-world applications. Akers (1998), for example, suggests that the probability of someone engaging in criminal behaviour increases when they are exposed to models who commit criminal behaviour, when they identify with these models, and when they develop the expectation of positive consequences for their own criminal behaviour. This is supported by Ulrich (2003), who found that the strongest cause of violent behaviour in adolescence was association with delinquent peer groups, where violence was both modelled and rewarded.

Another strength of social learning theory is that it is supported by research studies. The theory says that observing a model similar to the self should lead to more learning than observing a dissimilar model. Fox and Bailenson (2009) found evidence for this using computer-generated ‘virtual’ humans engaging in exercise or merely loitering. The models looked either similar or dissimilar to the participants. Participants who viewed the virtual model exercising engaged in more exercise in the 24 hours following the experiment than participants who viewed their virtual model loitering, or a dissimilar model exercising.
A major criticism of social learning theory’s explanation for deviant behaviour is that it says increased associations with deviant peers increases the likelihood that an individual will adopt the same values and behaviours. The problem is that the cause of delinquency may not be social learning as a result of exposure to deviant role models, but the possession of deviant attitudes prior to contact with deviant peers. This suggests young people who possess these deviant attitudes seek out people with similar attitudes.

Extra AO3 material for 16-mark A Level answers

Focusing exclusively on the process of social learning means that other potential influences on behaviour are disregarded. In explaining gender role development, for example, social learning theorists would emphasise the importance of gender-specific modelling. However, in real life, a child is exposed to many different influences. If virtually anything can have an influence on a specific behaviour, it becomes very difficult to show that social learning is the main causal factor.

Social learning theory can be applied to health campaigns, too. For example, Andsager et al. (2006) found that the perceived similarity to a model in an anti-alcohol advertisement was positively related to the message’s effectiveness. Health campaigns try to match characters that model the desired behaviours with the target audience in order to increase the level of identification, the aim being to bring about greater social learning. This shows that social learning is more effective when the role models are seen as similar to their target audience.

Page 131 No. 5.4

1. Internal mental processes are the ways in which we process information that helps to guide our behaviour. These include how we select important information (attention), how we use it to solve problems (thinking), how we store it and so on.

Schemas are cognitive frameworks that help to organise and interpret information in the brain and help an individual to make sense of new information. They are useful to us because they allow us to take shortcuts when interpreting the huge amount of information we have to deal with on a daily basis.

Theoretical models are simplified, usually pictorial, representations of a particular mental process based on current research evidence. An example of a theoretical model would be the working memory model.

Computer models use computer analogies as a representation of human cognition. For example, information stored on the hard disk is like long-term memory and RAM (random access memory) refers to working memory.

Cognitive neuroscience is an area of psychology dedicated to the underlying neural bases of cognitive functions. It uses fMRI and PET scans to see what parts of the brain become active in specific circumstances.

2. Theoretical models are simplified representations of a mental process, such as memory, based on current research evidence. These models are often pictorial in nature, represented by boxes and arrows that indicate cause and effect or the stages of a particular mental process. They are often incomplete and are updated and refined over time.

Computer models have led to a focus on the way sensory information is coded as it passes through the system. Using a computer analogy, information is inputted through the senses, encoded into memory and then combined with previously stored information to complete a task. The information stored on the hard disk is like LTM and the RAM (random access memory) corresponds to working memory.

3. Neuroscientists study the living brain, which gives them detailed information about the brain structures involved in different kinds of mental processing. The use of PET scans and fMRI helps psychologists to understand how the brain supports different cognitive activities and emotions by showing what parts of the brain become active in specific circumstances. For example, in one study Burnett et al. (2009) found that when people feel guilty, several brain regions are active, including the medial prefrontal cortex, an area associated with social emotions.
4. One strength of the cognitive approach in psychology is that it has been applied to many other areas of psychology. Research in social cognition has helped psychologists better understand how we form impressions of other people as well as the errors and biases that influence our interpretation of the causes of their behaviour.

Another strength of the cognitive approach is that it takes a scientific approach. The use of the experimental method provides researchers with a rigorous method for collecting and evaluating evidence. This means that conclusions about how the mind works are based on far more than common sense and introspection.

5. One limitation of the cognitive approach in psychology is that it uses computer models to explain human coding. However, there is an important difference between the sort of information processing that takes place within a computer program and the information processing that takes place within the human mind. Computers do not make mistakes, nor do they forget anything that has been stored, whereas humans do.

Another limitation is that although the cognitive approach can tell us how different cognitive processes take place, it fails to tell us why they do. The role of emotion and motivation has been largely ignored by this approach. The lack of focus on motivational states may be explained by the overdependence on information-processing analogies, as motivation is clearly irrelevant to a computer, but not to a human being.

6. The cognitive approach in psychology says that it is necessary to look at internal mental processes in order to understand behaviour. A lot of it uses an information-processing model, where information received by the senses is processed by various systems in the brain. These mental processes can’t be studied directly, so they are studied indirectly, by inferring what goes on as a result of measuring behaviour. This means that cognitive psychologists can develop theories about the mental processes that led to these behaviours. These are often either theoretical or computer models. Theoretical models are simplified, usually pictorial, representations of a particular mental process based on current research evidence. An example of a theoretical model would be the working memory model. Computer models use computer analogies as a representation of human cognition. For example, information stored on the hard disk is like long-term memory and RAM (random access memory) refers to working memory.

One strength of the cognitive approach in psychology is that it has been applied to many other areas of psychology. Research in social cognition has helped psychologists better understand how we form impressions of other people as well as the errors and biases that influence our interpretation of the causes of their behaviour.

However, many studies of cognitive psychology tend to use tasks that have little in common with participants’ natural everyday experiences. They often use artificial test materials such as random word lists, rather than try to understand the way memory is used in everyday life. This means that much of the research in cognitive psychology can be criticised for lacking ecological validity.

A further limitation of the cognitive approach is that it uses computer models to explain human coding. However, there is an important difference between the sort of information processing that takes place within a computer program and the information processing that takes place within the human mind. Computers do not make mistakes, nor do they forget anything that has been stored, whereas humans do.

Extra AO3 material for 16-mark A Level answers

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1. The genotype is the genetic make-up of an individual. It is a collection of inherited genetic material that is passed from generation to generation.

The phenotype is the observable characteristics of an individual. This is a consequence of the interaction of the genotype with the environment.

2. We each possess a unique combination of genetic instructions, therefore we differ from each other in terms of our personality, intelligence, abilities, and so on. Heritability refers to the amount of variability in a trait within a population that can be attributed to a difference between individuals within that population. The more that a trait is influenced by genetic factors the greater its heritability. For example, studies of identical twins have suggested that the variation in individual intelligence could be 60–80% due to genes.

3. The most important biological structure in behaviour is the brain, which consists of two cerebral hemispheres called the cerebrum. The surface of the cerebrum is called the cerebral cortex, which is responsible for many of the ‘higher-order’ functions such as thought and language. Neurons release chemicals called neurotransmitters. There are many different types of neurotransmitter, including dopamine. This is associated with our ‘drive’ or motivation. Serotonin is a neurotransmitter that is necessary to maintain a stable mood.

4. A genotype is the genetic code ‘written’ in the DNA of an individual’s cells and the phenotype is the physical appearance that results from this inherited information. Someone may inherit a recessive gene for blue eyes, but this will not be expressed if they have inherited a dominant gene for brown eyes. So we cannot determine the genotype from just observing the phenotype.

5. Individuals within a species differ from each other in terms of their physical characteristics and in their behaviour, and at least some of this variation is inherited. As individuals must compete with each other for access to resources, those who survive this competition and go on to reproduce will tend to have behaviours that are more likely to lead to survival and reproductive success than those who do not. These behaviours will be passed on to offspring and will become more widespread in the population through the process of natural selection. Successive generations will develop behaviours that are even more likely to lead to survival and reproductive success.

6. One strength of the biological approach in psychology is that it uses the scientific method as its main method of investigation. Experiments take place in highly controlled environments so that other researchers can replicate the research, thus adding to the validity of the findings.

Another strength of the biological approach in psychology is that it provides clear predictions, e.g. about the effects of neurotransmitters. This had led to significant applications of biological research in the real world. For example, research into the role of neurochemical imbalance in depression has led to the development of treatments that correct this imbalance and minimise depressive symptoms.

One limitation of the biological approach is that it is reductionist. Reductionism is the belief that complex human behaviour can be explained by breaking it down into its smallest parts, such as the action of genes, neurochemicals and hormones. However, critics argue that we cannot fully understand a behaviour without also taking account of the other factors that influence it, such as cognitive emotional and cultural factors.

A limitation with evolutionary explanations of behaviour is that they are complicated by the fact that most human behaviours can be transmitted by both genetic and cultural routes. Many established patterns of human behaviour have purely cultural origins with no survival or reproductive value. Incest taboos, for example, exist in most cultures and an evolutionary explanation would emphasise the genetic mutations that would arise from inbreeding, so natural selection would favour those who avoided it. However, most cultures also have a strict, culturally determined moral code of conduct that bans incest, too.

7. The biological approach sees people as biological organisms and so provides biological explanations of all aspects of psychological functioning. Biological psychologists are particularly interested in the genetic basis of behaviour, showing how some characteristics can be passed
from generation to generation through the genes. Biological researchers have also studied the important role played by chemical and hormonal changes in the nervous system. More recently, biological psychologists have become interested in how Darwin’s ideas about evolution might apply to human behaviour, allowing us to understand the original adaptive significance of behaviours such as aggression.

One strength of the biological approach in psychology is that it uses the scientific method as its main method of investigation. Experiments take place in highly controlled environments so that other researchers can replicate the research, thus adding to the validity of the findings. For example, the use of sophisticated imaging and recording techniques has increased the precision and objectivity of research into brain functioning.

Another strength of the biological approach is that it provides clear predictions about things like the effects of neurotransmitters. This has led to significant applications of biological research in the real world. For example, research into the role of neurochemical imbalance in depression has led to the development of treatments that correct this imbalance and minimise depressive symptoms. Similarly, research into circadian rhythms has led to significant improvements in the working conditions of shift workers.

However, an important limitation of the biological approach is that it is reductionist. Reductionism is the belief that complex human behaviour can be explained by breaking it down into its smallest parts, such as the action of genes, neurochemicals and hormones. Critics of the biological approach argue that we cannot fully understand a behaviour without also taking account of the other factors that influence it, such as cognitive, emotional and cultural factors.

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The argument that there is a genetic basis for criminal behaviour has led to concerns about how this information might be used. Critics claim it may lead to genetic screening of the population to identify this genetic susceptibility and subsequent discrimination against those with a predisposition for criminality. However, other psychologists argue that if individuals discover they have a genetic predisposition for criminality, then this gives them the opportunity to avoid environmental situations likely to trigger this predisposition.

Page 135 No. 5.6

1. Freud believed in the existence of a part of the mind that was inaccessible to conscious thought. He thought that most of our everyday actions and behaviours are not controlled consciously, but are the product of the unconscious mind. The mind actively prevents traumatic memories from the unconscious from reaching conscious awareness because these memories might cause anxiety.

2. Freud divided the mind into three structures, each of which demands gratification, but is frequently in conflict with the other parts. One part is the id which operates solely in the unconscious and acts according to the pleasure principle. It demands immediate gratification, regardless of the circumstances. The ego mediates between the impulsive demands of the id and the reality of the external world (the reality principle), and compromises between the impulsive id and the moralistic superego. The superego is divided into the conscience and the ego-ideal. The conscience is the internalisation of society’s rules. The ego-ideal is what a person strives towards and is probably determined by parental standards of good behaviour.
3. The id operates in the unconscious and acts according to the pleasure principle. It demands immediate gratification, regardless of the circumstances.

The ego mediates between the impulsive demands of the id and the reality of the external world (the reality principle). It must also compromise between the impulsive demands of the id and the moralistic demands of the superego.

The superego is divided into the conscience and the ego-ideal. The conscience is the internalisation of society’s rules and it determines which behaviours are permissible and causes feelings of guilt when rules are broken. The ego-ideal is what a person strives towards and is probably determined by parental standards of good behaviour.

4. Repression is the unconscious blocking of unacceptable thoughts and impulses. The repressed thoughts influence behaviour without the individual being aware of the reasons behind their behaviour. For example, someone who was abused by a parent as a child may have no recollection of these events, but has trouble forming relationships.

Denial is the refusal to accept reality to avoid having to deal with any painful feelings that might be associated with an event. The person acts as though the traumatic event had not happened. For example, an alcoholic will often deny that they have a drinking problem, even after being arrested several times for being drunk and disorderly.

Displacement involves the redirecting of thoughts and feelings, which are usually hostile, in situations where the person feels unable to express them in the presence of the person they should be directed towards. Instead they may take it out on a helpless victim or object. This gives their hostile feelings a route for expression, even though they are misapplied.

5. One strength of the psychodynamic approach in psychology is that the development of psychoanalysis represented a huge shift in psychological thinking. It suggested new methodological procedures, such as case studies, for gathering evidence, and the development of the approach was based on observations of behaviour rather than relying on introspection. It was also the first approach to suggest a psychological, rather than a biological, treatment for disorders such as depression.

Another strength is that some of the claims of psychoanalysis have been tested and supported by studies using scientific methodology. Fisher and Greenberg (1996) summarised 2,500 of these studies, and found support for the existence of unconscious motivation in human behaviour as well as for the defence mechanisms of repression, denial and displacement.

One limitation of psychoanalysis is that it is a gender-biased approach. Despite the fact that his theories were focused on sexual development, Freud seemed content to remain ignorant of female sexuality and how it may differ from male sexuality. Dismissing women and their sexuality is a problem, not only because Freud treated so many female patients, but also because his theories are still so influential today.

Another limitation of psychoanalysis is that it is culturally biased. Sue and Sue (2008) argue that it has little relevance to people outside of Western cultures. Psychoanalysts believe that mental disorders are the result of traumatic memories being locked into the unconscious, and freeing them through therapy gives the individual the chance to deal with them. However, in China, for example, a person who is depressed or anxious avoids thoughts that cause distress, rather than being willing to discuss them openly. This contrasts with the Western belief that open discussion and insight are always helpful in therapy.

6. The psychodynamic approach in psychology says that behaviour was determined more by psychological factors than by biological factors, or environmental reinforcement. Freud assumed that behaviour is largely controlled by the unconscious mind. This part of the mind is inaccessible to conscious thought. Most of our everyday actions and behaviours are not controlled consciously, but are the product of the unconscious mind. The mind actively prevents traumatic memories from the unconscious from reaching conscious awareness because these memories might cause anxiety. This means that it uses defence mechanisms to prevent the person becoming aware of them.
Freud divided the mind into three structures. One part is the id, which operates in the unconscious and acts according to the pleasure principle. It demands immediate gratification, regardless of the circumstances. The ego mediates between the impulsive demands of the id and the reality of the external world (the reality principle) and compromises between the impulsive id and the moralistic superego. The superego is divided into the conscience and the ego-ideal. The conscience is the internalisation of society’s rules and the ego-ideal is what a person strives towards.

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It has also been argued that psychoanalysis has little relevance to people outside of Western cultures. Psychoanalysts believe that mental disorders are the result of traumatic memories being locked into the unconscious and freeing them through therapy gives the individual the chance to deal with them. However, in China, for example, a person who is depressed or anxious avoids thoughts that cause distress, rather than being willing to discuss them openly. This contrasts with the Western belief that open discussion and insight are always helpful in therapy.

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A further strength of the psychodynamic approach is the comprehensive nature of the theory. As well as its therapeutic applications, it can be used to explain human behaviour in many other fields beyond psychology. For example, psychoanalysis has been used as a form of literary criticism. Works like Shakespeare’s *Hamlet* have repressed messages hidden beneath the text’s surface. By interpreting these works using psychoanalytic concepts, we can delve into the mind of the author or fictional character. For example, many aspects of Hamlet’s psyche are argued to be a projection of Shakespeare’s own mind.

**Page 137 No. 5.7**

1. Free will is the ability to choose how to behave without being influenced by external forces. It means that we have full conscious control over our own destiny.

   Self-actualisation is the final stage of Maslow’s hierarchy of needs. It involves moments of extreme inspiration and ecstasy during which an individual feels able to leave behind all doubts, fears and inhibitions.

   Congruence is a state that happens when there is a similarity between a person’s ideal self and self-image. It is rare for a state of congruence to exist.

   Conditions of worth are conditions imposed on an individual’s behaviour and development that are considered necessary to earn positive regard from significant others. Individuals believe these conditions have to be in place if they are to be accepted by others and see themselves positively.
2. Researchers have depicted Maslow's hierarchy of needs in the form of a pyramid. The basic physiological needs, such as food, water and sleep, are represented at the bottom of the pyramid and the most advanced needs, such as self-esteem and self-actualisation, at the top. Each need at a lower level must be fulfilled before a person can move up to a higher need. Maslow believed that the more basic the need, the more powerfully it is experienced, and the more difficult it is to ignore.

3. Rogers believed that an individual's psychological problems were a direct result of their conditions of worth and the conditional positive regard they receive from other people. Humanistic therapists regard themselves as facilitators to help people understand themselves and find ways to enable their potential for self-actualisation. Counsellors provide empathy and unconditional positive regard, expressing their acceptance and understanding of what the client says. By doing this, the therapist is able to offer a supportive environment to help dissolve the client's conditions of worth.

4. One strength of humanistic psychology is that there is research support for conditions of worth. Harter et al. (1996) discovered that teenagers who feel they have to fulfil certain conditions in order to gain their parents' approval end up not liking themselves. The researchers found that adolescents who create a 'false self', pretending to be the kind of person their parents would love, are also more likely to develop depression and a tendency to lose touch with their own true self.

One limitation of humanistic psychology is that it represents an overly idealised and unrealistic view of human nature. People are not as good or as growth-oriented as humanistic theories suggest, and the approach does not adequately recognise people's capacity for pessimism and self-destructive behaviour. The assumption that all problems arise from blocked self-actualisation is an oversimplification, so encouraging people to focus on their own self-development, rather than on situational forces, may not be appropriate.

5. One strength of Maslow's approach is that it may have relevance on a much larger stage than individual growth. For example, Hagerty (1999) looked at the relationship between measures of economic growth and Maslow's need levels in 88 countries over a 34-year-period. Countries in the early stages of economic development were characterised by lower level needs, such as access to food and safety needs. Only in the advanced stages of economic development did esteem needs, such as female emancipation, and self-actualisation, such as educational enrolment levels, become important.

One limitation of humanistic psychology is that it represents an overly idealised and unrealistic view of human nature. People are not as good or as growth-oriented as humanistic theories suggest, and the approach does not adequately recognise people's capacity for pessimism and self-destructive behaviour. The assumption that all problems arise from blocked self-actualisation is an oversimplification, so encouraging people to focus on their own self-development, rather than on situational forces, may not be appropriate.
A further limitation of the humanistic approach is that counselling cannot be tested experimentally due to the rigorous requirements of the experimental method. Rogers was an advocate of non-experimental methods, and studies have shown that personal growth can happen as a result of humanistic counselling, but they do not show that the therapy caused the changes. This means that it is difficult to evaluate the humanistic approach, and its therapy, scientifically.

Another strength of humanistic psychology is that there is research support for conditions of worth. Harter et al. (1996) discovered that teenagers who feel they have to fulfil certain conditions in order to gain their parents’ approval end up not liking themselves. The researchers found that adolescents who create a ‘false self’, pretending to be the kind of person their parents would love, are also more likely to develop depression and a tendency to lose touch with their own true self.

Cross-cultural research has shown that needs may appear in a different order or may even be absent altogether in other cultures. Nevis (1983) found that, in China, belongingness needs were seen as more fundamental than physical needs, and self-actualisation was defined more in terms of contributions to the community than individual development. Many other studies have confirmed that people in Western cultures focus more on personal identity, whereas other cultures define self-concept in terms of social relationships.

**Page 139 No. 5.8**

1. **Psychodynamic vs Social learning**
   - Similarity: Both consider behaviour to be largely a result of nurture, but both acknowledge that nature plays a role.
   - Difference: Social learning’s research investigations use the scientific method. Psychodynamic research investigations tend to involve non-scientific methods, such as case studies.

2. **Cognitive vs Biological**
   - Similarity: Both approaches align themselves to the scientific method when conducting research.
   - Difference: The cognitive approach considers humans to have some degree of control over our behaviour while the biological approach does not.

3. **Humanistic vs Behavioural**
   - Similarity: Behaviour is generally considered to be a result of nurture in both approaches.
   - Difference: Behavioural approach uses the scientific method when conducting research. Humanistic research investigations do not.

4. **Biological vs Psychodynamic**
   - Similarity: Both the biological approach and the psychodynamic approach say our behaviour is determined.
   - Difference: The biological approach’s research investigations use the scientific method. Psychodynamic research investigations tend to involve non-scientific methods, such as case studies.
Chapter 6

Some suggested answers to the ‘Can you?’ questions in the Fourth edition AS Complete Companion book are given here. Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Page 149 No. 6.1

1. The central nervous system (CNS) comprises the brain and spinal cord, and has two main functions. These are the control of behaviour and the regulation of the body’s physiological processes. To do this, the brain receives information from the sensory receptors (e.g. eyes and skin) and sends messages to the body’s muscles and glands. These messages are sent via the spinal cord, a collection of nerve cells that are attached to the brain and run the length of the spinal column.

2. The sympathetic nervous system and the parasympathetic nervous system.

3. The brain and spinal cord.

4. The somatic nervous system (SNS) relays sensory messages to the central nervous system using sensory neurons, and relays information from the central nervous system to other areas of the body using motor neurons. The SNS is also involved in reflex actions without the involvement of the central nervous system, which allows the reflex to occur very quickly.

5. The autonomic nervous system (ANS) regulates involuntary actions, such as heart beat and digestion, without us being consciously aware of these happening. The ANS is necessary because things like heartbeat and digestion would not work so efficiently if we had to think about them. The ANS has two parts, the sympathetic and parasympathetic. The parasympathetic system is involved with energy conservation and slows physiological activity down. The sympathetic system is primarily involved in responses that help us deal with emergencies, such as increasing heart rate and blood pressure.

Page 151 No. 6.2

1. Sensory neurons carry nerve impulses from sensory receptors, such as those for vision, to the spinal cord and brain. When the impulses reach the brain, they are translated into sensations of, for example, vision. Motor neurons form synapses with muscles and control their contractions. The strength of the contraction depends on the rate of firing of the axons of motor neurons that control it. Relay neurons allow sensory and motor neurons to communicate with each other. They lie wholly within the brain and spinal cord.

2. Synaptic transmission is the process by which a nerve impulse passes across the synaptic gap from a pre-synaptic neuron to a post-synaptic neuron. When an action potential reaches the synaptic vesicle of the pre-synaptic neuron, it causes it to release a neurotransmitter through a process called exocytosis. The neurotransmitter diffuses across the synaptic gap and binds to specialised receptors on the surface of the post-synaptic neuron. The neurotransmitter makes it either more likely or less likely that the post-synaptic neuron will ‘fire’.

3. In synaptic transmission, the term ‘excitation’ refers to a neurotransmitter which increases the likelihood that an excitatory signal is sent to the post-synaptic cell, making it more likely that the neuron will ‘fire’. The term ‘inhibition’ refers to a neuron which decreases the likelihood of a neuron ‘firing’.

4. Excitatory neurotransmitters, such as noradrenaline, act as the nervous system’s ‘on switches’ and they make it more likely that a post-synaptic neuron will ‘fire’, and a behaviour will occur. Inhibitory neurotransmitters, such as GABA, are the nervous system’s ‘off switches’ in that they decrease the likelihood that a post-synaptic neuron will ‘fire’, and make it less likely that a behaviour will occur.
1. The endocrine system is a network of glands throughout the body that manufacture and secrete hormones into the bloodstream. The endocrine system works very closely with the nervous system to regulate the physiological processes of the body. Each gland in the endocrine system produces different hormones, which regulate the activity of the organs and tissues in the body. The endocrine system is regulated by feedback similar to how a thermostat regulates room temperature. For example, as levels of a hormone rise in the bloodstream, secretion of the hormone is reduced. This results in stable concentrations of hormones circulating in the body.

2. Endocrine glands produce and secrete hormones. Each gland in the endocrine system produces different hormones that regulate the activity of cells or organs in the body. The timing of a hormone’s release by an endocrine gland is critical for normal functioning, as are the levels of hormone released. Too much or too little at the wrong time can result in dysfunction of bodily systems, as in Cushing’s syndrome. In this, very high levels of cortisol are produced, resulting in high blood pressure and depression.

3. The role of the adrenal gland is to produce cortisol (from the adrenal cortex) and adrenaline and noradrenaline (from the adrenal medulla). Adrenaline helps the body to respond to acute stress by increasing heart rate and blood flow to the muscles and brain, and encouraging the breakdown of glycogen into glucose to provide energy.

Page 155 No. 6.4

1. The fight-or-flight response is a sequence of activity within the body that is triggered when the body prepares itself for defending or attacking (fight) or running away to safety (flight).

2. The fight-or-flight response enables us to react quickly to life-threatening situations. The hypothalamus activates the sympathetic nervous system, which sends a signal to the adrenal medulla. This releases adrenaline into the bloodstream. Adrenaline causes increases in heart rate, breathing, and blood pressure, so more oxygen reaches the heart and muscles. It also triggers the release of glucose into the blood to supply energy, but decreases when the threat has passed. The parasympathetic nervous system restores heart rate and blood pressure to normal, and allows digestion to restart.

3. Adrenaline’s role is to cause the heart to beat faster, pushing blood to the muscles, heart, and other vital organs, and to increase blood pressure. Breathing becomes more rapid in order to take in as much oxygen as possible with each breath. Adrenaline also triggers to release of blood sugar (glucose) and fats, which flood into the bloodstream, supplying energy to parts of the body associated with the fight-or-flight response.

4. The fight-or-flight response enables us to react quickly to life-threatening situations, and it has evolved to help us survive a dangerous world by fighting off a threat or running away to save our lives. The fight-or-flight response evolved because it helps us to survive and reproduce, and is therefore adaptive. It is triggered by the amygdala, which associates sensory inputs, such as sounds, with emotions like fear and anger. The amygdala then sends a distress signal to the hypothalamus.

The hypothalamus activates the sympathetic nervous system, which sends a signal to the adrenal medulla. This releases adrenaline into the bloodstream. Adrenaline causes increases in heart rate, breathing, and blood pressure, so more oxygen reaches the heart and muscles. It also triggers the release of glucose into the blood to supply energy. When the threat has passed, the parasympathetic nervous system restores heart rate and blood pressure to normal, and allows digestion to restart.

The fight-or-flight response is a useful way of defending against a stressor that requires energetic behavioural responses. However, modern-day stressors rarely require such levels of physical activity. Unfortunately, repeated activation of the stress response can lead to physical damage in blood vessels and eventually to heart disease, meaning that the fight-or-flight response can actually have negative as well as positive consequences.
It has also been argued that the first phase of reaction to threat is not to fight or flee, but to avoid confrontation. Gray (1988) says that most animals, including humans, display the ‘freeze response’, which enables us to assess the threat before responding. ‘Freezing’ is an adaptive response because it focuses attention and makes us look for new information in order to make the best response to a particular threat. Therefore, the fight-or-flight response is not the only way we respond to a threat.

It has also been proposed that the characteristic response of women to threat is a pattern of ‘tend and befriend’ rather than ‘fight-or-flight’. Taylor et al. (2000) suggest that women have a completely different system for coping with stress because their responses evolved in the context of being the primary caregiver of their children. Fleeing too readily at any sign of danger would put a female’s offspring at risk. This suggests that the fight-or-flight response may be a maladaptive rather than adaptive response for women.

**Extra AO3 material for 16-mark A Level answers**

Another explanation of gender differences in the fight-or-flight response has been suggested by Lee and Harley (2012). They found that the SRY gene, which is on the male Y chromosome, promotes the development of male aggression. This gene might prime males to release more adrenaline when threatened. The absence of this gene in females, who do not have a Y chromosome, may prevent women from responding to stress in the same way as men do.

The classic view that men respond to stress only with ‘fight or flight’ and women ‘tend and befriend’ has been challenged by Von Dawans et al. (2012). They found that acute stress can actually lead to greater cooperative and friendly behaviour, even in men, as in the terrorist attacks on New York in 2001. It could be that stress may lead to greater cooperative behaviour because human beings are fundamentally social animals and it is the protective nature of human relationships that has allowed us to survive.

**Page 157 No. 6.5**

1. The term ‘localisation of function’ refers to the belief that specific areas of the brain are associated with specific cognitive processes, such as language and memory.

2. The motor centre is responsible for the generation of voluntary movements. Both cerebral hemispheres have a motor centre, with the centre on one side of the brain controlling the muscles on the opposite side of the body. Different parts of the motor centre exert control over different parts of the body.

3. The role of the somatosensory area is to detect sensory events arising from different regions of the body. It is dedicated to the processing of sensory information relating to touch. Using sensory information from the skin, the somatosensory cortex produces sensations of touch, pressure, pain, and temperature, which it then localises to specific body regions.

4. The role of the visual centre is to process different types of visual information, such as colour, shape, and movement. The visual centre in the right cerebral hemisphere receives its information from the left visual field, while the visual centre in the left cerebral hemisphere receives its input from the right visual field.

5. The role of the auditory centre is to decode sounds. The cochlea (in the inner ear) converts sound waves to nerve impulses. These impulses travel to the brain stem, which decodes a sound’s duration and intensity. Auditory information is then passed to the thalami, which carry out further processing, before the information is passed to the auditory centre where a sound is recognised and responded to.

6. Broca’s area is an area in the frontal lobe of the brain, and is usually found in the left hemisphere. It is primarily involved in speech production. However, the area is also involved in responding to many demanding cognitive tasks which have nothing to do with language, such as performing maths problems. Wernicke’s area is in the posterior portion of the left frontal lobe, near the auditory cortex. Information from the auditory area is transferred to Wernicke’s area where it is recognised and understood as language.
7. Localisation of function refers to the principle that specific functions, such as language, memory, and hearing, have specific locations within the brain. For example, Broca (1985) studied a patient called Tan, who was able to understand spoken language, but was unable to speak or express his thoughts in writing. He also studied other patients, who had similar language deficits. Broca found that they all had lesions in the same area of the left frontal lobe. This led Broca to propose a ‘language centre’ in the posterior portion of the frontal lobe of the left hemisphere (which is now known as Broca’s area).

Another part of the brain involved in language is Wernicke’s area. This is in the posterior portion of the left temporal lobe. Patients with a lesion in Wernicke’s area can speak but cannot understand language. Wernicke proposed that language involves separate motor and sensory regions located in different cortical regions. The motor region, located in Broca’s area, is close to the area that controls the mouth, tongue and vocal cords. The sensory region, located in Wernicke’s area, is close to regions of the brain responsible for auditory and visual input.

Evidence for the different functions of Broca’s and Wernicke’s areas in language production and understanding comes from the discovery that damage to them produces different types of aphasia. Expressive aphasia is an impaired ability to produce language, caused by damage to Broca’s area. Receptive aphasia is an impaired ability to understand language. This is usually the result of damage in Wernicke’s area, demonstrating the important role played by this brain region in the comprehension of language.

Not all researchers agreed with the view that cognitive functions are localised in the brain. Lashley (1930) proposed equipotentiality theory, which says that whilst basic motor and sensory functions are localised, higher mental functions are not. Lashley claimed that intact areas of the cortex could take over responsibility for specific cognitive functions following injury to the area normally responsible for this function. This view has received some support from the discovery that humans were able to regain some cognitive abilities following damage to specific brain areas.

Other researchers believe that what might be more important is how brain areas communicate with each other, rather than which specific brain regions control a particular cognitive process. For example, Dejerine (1892) described a case in which the loss of an ability to read resulted from damage to the connection between the visual cortex and Wernicke’s area. This suggests that complex behaviours, such as language, reading and movement are built up gradually as a stimulus enters the brain, then moves through different structures before a response is produced.

There are individual differences in language areas. For example, in a study of silent reading, Bavelier et al. (1997) found a large variability in individual activation patterns across different individuals. They observed activity in the right temporal lobe as well as in the left frontal, temporal and occipital lobes. Other studies have found significant gender differences in the size of the brain areas associated with language. Harasty et al. (1997), for example, found that women have proportionally larger Broca’s and Wernicke’s areas than men.

One problem with research in this area is that lesions often affect several brain areas. For example, Dronkers et al. (2007) examined the preserved brains of two of Broca’s patients using MRI, and found other areas were damaged, too. In fact, lesions that only affect Broca’s area generally only result in temporary speech disruption. This suggests that language involves networks of brain regions, not just a few specific areas.
the right hemisphere excels at visual-motor tasks. The two hemispheres are connected by bundles of nerve fibres such as the corpus callosum. These nerve fibres enable the left and right hemispheres to exchange information. For example, facial recognition is a right hemisphere specialisation, but we can talk about a face using structures in the left hemisphere because the corpus callosum allows information to be transferred between the hemispheres.

3. Split-brain research has confirmed the view that the two cerebral hemispheres are specialised for different functions. For example, if a split-brain patient is shown a picture of a dog in his right visual field (which sends that visual information to the left hemisphere), he is able to identify the picture correctly. If the same picture is shown in the left visual field (which sends that information to the right hemisphere) the patient denies seeing anything. This is because although the right hemisphere saw the picture, it does not have a language centre, and so cannot respond verbally. The verbal response to the question comes from the left hemisphere, which has Broca’s area, but since it did not see the picture it denies seeing anything.

4. Brain lateralisation refers to the fact that the two halves of the human brain are not exactly alike. Each hemisphere is specialised, so neural mechanisms for some functions, like language, are localised primarily in one half of the brain. The two cerebral hemispheres ‘talk’ to each other by means of a structure called the corpus callosum. The chance to investigate the different abilities of the two hemispheres came about when, in a treatment for severe epilepsy, surgeons cut the bundle of nerve fibres that formed the corpus callosum.

Sperry and Gazzaniga (1967) tested the capabilities of the separate hemispheres by sending visual information to just one hemisphere at a time. Information from the left visual field goes to the right hemisphere and information from the right visual field goes to the left hemisphere. Because the corpus callosum is cut in split-brain patients, the information presented to one hemisphere has no way of travelling to the other hemisphere and can be processed only in the hemisphere that received it. Their studies showed that the left hemisphere specialises in language, whereas the right hemisphere specialises in visuo-spatial processing and face recognition.

Split-brain research has limitations as this procedure isn’t done very often. Also, many studies included only a few participants, and sometimes just one. Andrewes (2001) claims that conclusions have been drawn from individuals who have either a confounding physical disorder that made the split-brain procedure necessary, or have had a less complete sectioning of the two hemispheres than was originally believed. This means that the results of studies are not always replicated, and it may be unwise to draw general conclusions about them.

The main advantage of brain lateralisation appears to be an increase in neural processing capacity. However, there is little evidence that lateralisation confers any advantage to the functioning of the human brain. Rogers et al. (2004) found that in chickens, brain lateralisation is associated with an enhanced ability to perform two tasks simultaneously, such as finding food and watching for predators. This suggests that brain lateralisation enhances brain efficiency in cognitive tasks that demand the simultaneous but different use of both hemispheres.

Lateralisation of function appears to change with normal ageing. Across many types of tasks and many brain areas, lateralised patterns found in younger individuals tend to switch to bilateral patterns in healthy older adults. Szaflarski et al. (2006) found that language became more lateralised to the left hemisphere with increasing age in children and adolescents, but after the age of 25, lateralisation decreased with age. This might be because using the extra processing resources of the other hemisphere may in some way compensate for age-related decline in function.

Language may not be restricted to the left hemisphere. Some of the early discoveries from split-brain research have been disconfirmed by later research. For example, although left hemisphere damage was found to be far more detrimental to language function than right hemisphere damage, case studies have demonstrated that this is not necessarily the case. JW, for example, developed the capacity to speak out of the right hemisphere, and can now speak about information presented to the left or the right brain.
There are several advantages and disadvantages associated with hemispheric lateralisation. For example, architects and the mathematically gifted typically have superior right-hemispheric skills, but are also much more likely to be left-handed and to suffer high rates of allergies and immune system problems. Tonnessen et al. (1993) found a small, but significant, relationship between handedness and immune disorders. This suggests that the same genetic processes that lead to lateralisation may also affect the development of the immune system.

Page 161 No. 6.7

1. The term ‘plasticity of the brain’ refers to the brain’s ability to modify its own structure and function as a result of experience.

2. Kuhn et al. (2014) found that playing a particular video game results in new synaptic connections in brain areas involved in spatial recognition, strategic planning, working memory, and motor performance. These are all skills that are important in playing that particular video game. Boyke et al. (2008) found evidence of brain plasticity in 60-year-olds taught a new skill – juggling. There was evidence of increases in grey matter in the visual cortex, although when the practising stopped, these changes were reversed.

3. Research has found that when brain cells are damaged or destroyed through, for example, a stroke, the brain rewire itself over time so that some level of function can be regained. Although parts of the brain may be damaged or destroyed as a result of a trauma, other parts take over the functions that were lost. Neurons next to damaged brain areas can form new circuits that resume some of the lost function. For example, Tajiri et al. (2013) gave stem cell transplants to rats with traumatic brain injury. Three months afterwards, their brains showed clear development of neuron-like cells in the area of injury. This was accompanied by a solid stream of stem cells migrating to the site of the brain injury.

4. Brain plasticity refers to the brain’s ability to change and adapt as a result of experience. The brain continues to create new neural pathways and alter existing ones to adapt to new experiences as a result of learning. As people have new experiences, nerve pathways that are used frequently develop stronger connections, whereas neurons that are rarely or never used eventually die. By developing new connections and pruning away weak ones, the brain is able to adapt to a changing environment constantly.

The brain also appears to show evidence of functional recovery, moving functions from a damaged area of the brain after trauma to other, undamaged areas. When a stroke damages brain cells, other parts sometimes take over their functions. This can happen by neural unmasking, which is where dormant synapses in the brain can be reactivated when they receive more neural input than before, creating a lateral spread of activation which, in time, gives way to the development of new structures.

One study, which showed the brain’s ability to change as a result of experience, was conducted by Kempermann et al. (1998) on rats. The researchers found that compared with rats housed in a laboratory, rats housed in a complex environment showed an increase in neurons in the hippocampus, a part of the brain associated with the formation of new memories and the ability to navigate from one location to another.

Research has shown that humans also demonstrate plasticity after exposure to an enriched environment. Maguire et al. (2000) studied London taxi drivers to discover whether changes in the brain could be detected as a result of their extensive experience of spatial navigation, using an MRI scanner. The posterior hippocampi of taxi drivers were significantly larger relative to those of control participants and posterior hippocampal volume was positively correlated with the amount of time they had spent as a taxi driver.

Tajiri et al. (2013) randomly assigned rats with traumatic brain injury to one of two groups. One received stem cell transplants into the traumatised brain region. A control group received a solution infused into the brain containing no stem cells. Three months later, only the brains of the stem cell rats showed clear development of neuron-like cells in the area of injury. This provides evidence for the role of stem cells in recovery from brain injury.
Patients with college-level attainment are much more likely to recover after a moderate to severe traumatic brain injury. Schneider et al. (2014) retrospectively examined data from the US Traumatic Brain Injury Systems Database and found nearly 40% of patients with a college-level education achieved disability-free recovery after a year, compared with less than 10% of patients who left school early. The researchers concluded that ‘cognitive reserve’ could be a factor in neural adaptation during recovery from traumatic brain injury.

Functional plasticity reduces with age, so adults may need to develop compensatory behavioural strategies to work around the deficit, such as seeking social support. However, studies have suggested that even abilities commonly thought to be fixed in childhood can still be modified in adults with intense retraining. Despite these indications of adult plasticity, Elbert et al. (2001) conclude that the capacity for neural reorganisation is much greater in children than in adults.

Page 163 No.6.8

1. fMRI is a technique used for measuring changes in brain activity while a person performs a task. It does this by measuring changes in blood flow in particular areas of the brain, which indicates increased neural activity in those areas. As a result of these changes in blood flow, researchers are able to produce maps showing which areas of the brain are involved in a particular mental activity.

2. One strength of fMRI is that it is non-invasive because it does not involve the insertion of instruments into the body and it does not expose the brain to potentially harmful radiation, as is the case with some other scanning techniques used in the study of the brain. One limitation of fMRI is that, because it measures changes in blood flow in the brain, it is not a direct measure of neural activity in particular brain areas. This means that it is not a truly quantitative measure of mental activity in these brain areas.

3. An EEG measures electrical activity in the brain. Electrodes placed on the scalp detect small electrical charges resulting from the activity of brain cells. When electrical signals from the different electrodes are graphed over a period of time, the resulting representation is called an EEG. The four basic EEG patterns are alpha waves, beta waves, delta waves and theta waves.

4. One strength of the EEG technique is that it provides a recording of the brain’s activity in real time, rather than a still image of a passive brain. This means that the researcher can accurately measure a particular task or activity with the brain activity associated with it. One limitation of EEGs is that they can only detect the activity in superficial regions of the brain, but cannot reveal what is going on in the deeper regions, such as the hypothalamus or hippocampus. Electrodes can be implanted into non-humans to achieve this, but it is not ethically permissible to do this with humans because this would be too invasive.

5. Event-related potentials (ERPs) are very small voltage changes in the brain that are triggered by specific events or stimuli, such as cognitive processing of a specific stimulus. ERPs can be divided into two categories. Waves occurring within the first 100 milliseconds after presentation of the stimulus are termed ‘sensory’ ERPs as they reflect an initial response to the physical characteristics of the stimulus. ERPs generated after the first 100 milliseconds reflect the manner in which the subject evaluates the stimulus, and are termed ‘cognitive’ ERPs.

6. One strength of ERPs is that because they provide a continuous measure of processing in response to a particular stimulus, it makes it possible to determine how processing is affected by a specific experimental manipulation, for example, during presentation of different visual stimuli. One limitation of the ERP technique is that only sufficiently strong voltage changes generated across the scalp are recordable. Important electrical activities occurring deep in the brain are not recorded, meaning that the generation of ERPs tends to be restricted to the neocortex.

7. Post-mortem examinations are used to establish the underlying neurobiology of a particular behaviour. Researchers are able to study a person who displays behaviour while they are alive that suggests possible underlying brain damage. Subsequently, when the person dies, the researchers can examine the dead person’s brain to look for abnormalities that might explain that behaviour and are not found in control individuals. The use of post-mortem studies has been used to establish a link between psychiatric disorders, such as schizophrenia and depression, and underlying brain abnormalities.
8. One strength of post-mortem examinations is that they allow for a more detailed examination of anatomical and neurochemical aspects of the brain than would be possible with the sole use of non-invasive scanning techniques such as fMRI and EEG. For example, it enables researchers to examine deeper regions of the brain such as the hypothalamus and the hippocampus. One limitation of post-mortem examinations is that they are retrospective as the person is already dead. As a result, the researcher is unable to follow up on anything that arises from the post-mortem concerning a possible relationship between brain abnormalities and cognitive functioning.

9. One strength of fMRI is that it is non-invasive because it does not involve the insertion of instruments into the body and it does not expose the brain to potentially harmful radiation, as is the case with some other scanning techniques used in the study of the brain. A second strength of fMRI is that it offers a more objective and reliable measure of psychological processes than is possible with verbal reports. It is useful as a way of investigating psychological phenomena that people would not be capable of providing in verbal reports.

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Page 165 No. 6.9

1. A circadian rhythm is a pattern of behaviour that occurs or recurs approximately every 24 hours, and which is set and reset by environmental light levels.

2. One example of a circadian rhythm is the sleep–wake cycle. This is dependent on the 24-hour circadian cycle and it dictates when we should be sleeping, but also when we should be awake.

3. Circadian rhythms are driven by biological clocks, which are found in all cells of the body. The clocks are synchronised by a master circadian pacemaker called the suprachiasmatic nucleus (SCN), which is located in the hypothalamus. This pacemaker must be constantly reset so that the body is in synchrony with the outside world. Light provides the primary input to this system, setting the SCN to the correct time in a process called ‘photoentrainment’. In mammals, light-sensitive cells within the eye act as brightness detectors, sending messages about environmental light levels directly to the SCN. The SCN then uses this information to coordinate the activity of the entire circadian system.

4. Michel Siffre subjected himself to long periods of time living underground in order to study his own circadian rhythms. While living underground he had no external cues to guide his rhythms – no daylight, clocks, or radio and he simply woke, ate and slept when he felt it was appropriate to do so. The only thing influencing his behaviour was the ‘free-running’ circadian rhythm of his internal body clock. Siffre found that his natural circadian rhythm was slightly longer than the solar day when he first conducted his study in 1962. It was much longer when he repeated the study aged 60, suggesting that the biological clock ticks more slowly with increasing age.

5. Our circadian rhythms are driven by our body clocks, and synchronised by the suprachiasmatic nucleus (SCN), which is in the hypothalamus. This pacemaker must constantly be reset so that our bodies are in synchrony with the outside world. Light provides the primary input to this system, setting the body clock to the correct time in a process termed photoentrainment. The SCN then coordinates the activity of the entire circadian system.

The circadian rhythm not only dictates when we should be sleeping, but also when we should be awake. Light and darkness are the external signals that determine the need to sleep and wake up. Sleep and wakefulness are also under homeostatic control. When we have been awake for a long period of time, homeostasis tells us that the need for sleep is increasing because of the amount of energy used up during wakefulness. This homeostatic drive for sleep increases gradually throughout the day, reaching its maximum in the late evening when most people fall asleep.

Hughes (1977) tested the circadian hormone release in people at the British Antarctic Station. At the end of the Antarctic summer, cortisol levels followed the familiar pattern, peaking as the participants awoke, and reaching their lowest point as the participants retired to bed. However, after three months of continuous darkness, this pattern changed, with the peak cortisol levels now at noon rather than as the men awoke. This suggests that the extremes of daylight found in polar regions of the world may be responsible for variations in circadian hormone release.
There are individual differences in circadian rhythms. One is the cycle length; Czeisler et al. (1999) has found that circadian cycles can vary from 13 to 65 hours. Also, people appear to be innately different in terms of when their circadian rhythms peak. For example, Duffy et al. (2001) found that ‘morning people’ prefer to rise and go to bed early (about 6 am and 10 pm), whereas ‘evening people’ prefer to wake and go to bed later (10 am and 1 am).

One weakness of early research was its assumption that artificial dim light would not affect circadian rhythms. However, research suggests that this is not true. For example, Czeisler et al. (1999) altered participants’ circadian rhythms down to 22 hours and up to 28 hours by using dim artificial lighting alone. This finding shows that circadian rhythms are affected by artificial light.

One real-world application of circadian rhythms is chronotherapeutics – the study of how timing affects drug treatments. To be most effective, drugs need to be released into the body at the optimal time. For example, the risk of heart attack is greatest during the early morning hours after awakening. This has led to the development of a novel drug delivery system, so that the drug can be administered at the right time.

The SCN responds to light entering the eye, and so it is sensitive to the day–night cycle. However, Buhr et al. (2010) believe that temperature may control our body clock, rather than light. The SCN transforms information about light levels into neural messages that set the body’s temperature. Buhr et al. found that these fluctuations in temperature set the timing of cells in the body, and therefore cause tissues and organs to become active or inactive.

Page 167 No.6.10

1. Infradian rhythms are biological rhythms that have a duration of over 24 hours, and may be weekly, monthly, or even annual. Ultradian rhythms are biological rhythms that have a duration of less than 24 hours.

2. One infradian rhythm is the female menstrual cycle in humans which happens on a monthly cycle. There are considerable variations in the length of this cycle, with some women experiencing a relatively short 23-day cycle whereas others have a cycle as long as 36 days; the average appears to be around 28 days. An example of an ultradian rhythm is the five stages that make up a typical night’s sleep. The ultradian rhythm found in human sleep follows a pattern of alternating REM (rapid eye movement) and NREM (non-rapid eye movement) sleep. This cycle repeats itself about every 90–100 minutes throughout the night.

3. An ultradian rhythm is one that has a period shorter than 24 hours. In humans, an example of this would be the five stages that make up a typical night’s sleep. The ultradian rhythm found in human sleep follows a pattern of alternating REM (rapid eye movement) and NREM (non-rapid eye movement) sleep. This cycle repeats itself about every 90–100 minutes throughout the night.

Infradian rhythms are biological rhythms that have a duration of over 24 hours, and may be weekly, monthly, or even annual. One infradian rhythm is the female menstrual cycle in humans, which happens on a monthly cycle. There are considerable variations in the length of this cycle, with some women experiencing a relatively short 23-day cycle whereas others have a cycle as long as 36 days, but the average appears to be around 28 days.

Differences in people’s sleep patterns are usually explained in terms of non-biological factors, such as room temperature. However, research suggests that they may be biologically determined. For example, Tucker et al. (2007) found large differences between individual’s sleep patterns, which showed up consistently across the eight nights they spent in a controlled laboratory environment. This means that differences between participants were not driven by their circumstances, but were at least partially biologically determined.

There is evidence that the 90-minute cycle seen during sleep also occurs during the day. For example, Ericsson et al. (2006) found that, among a group of elite violinists, practice sessions were usually limited to a duration of no more than 90 minutes at a time and the violinists frequently napped between practice sessions. The researchers also discovered the same pattern among other musicians, athletes, chess players and writers, supporting the existence of a 90-minute ultradian cycle of alertness and fatigue, during the waking day.
The menstrual cycle can also be controlled by exogenous cues. When several women of childbearing age live together and do not take oral contraceptives, their menstrual cycles tend to synchronise. Russell et al. (1980) rubbed daily samples of sweat from one group of women onto a separate group of women and their menstrual cycles synchronised. This suggests that menstrual cycles can be affected by pheromones as well as hormones from the pituitary gland.

There is evidence to suggest that human mate choice varies, with different preferences at different stages of the menstrual cycle. For example, Penton-Voak et al. (1999) found women generally expressed a preference for 'slightly feminised' male faces when picking a long-term partner as they may represent kindness and cooperation. However, during the ovulatory phase of their menstrual cycle, women showed a preference for more masculinised faces, as these may represent good genes. This shows how behaviour is affected by this infradian rhythm.

Many people believe that an infradian rhythm based on the phases of the moon affects some types of human behaviour. For example, many midwives believe that more babies are born during a full moon than during a new moon, and at least some workers in mental health professions believe that a full moon can alter behaviour. However, the statistics do not support these beliefs. This shows that people's beliefs about certain kinds of rhythm may be purely subjective.

Page 169 No. 6.11

1. Endogenous pacemakers are mechanisms within the body that govern internal, biological bodily rhythms. Exogenous zeitgebers are environmental cues, such as light, that help to regulate an organism’s biological clocks.

2. In mammals, the main endogenous pacemaker is a tiny cluster of nerve cells called the suprachiasmatic nucleus (SCN), which lies in the hypothalamus. The SCN plays an important part in generating the body’s circadian rhythm, and acts as a ‘master clock’, which links to other brain regions that control sleep and arousal. The SCN also regulates the manufacture and secretion of melatonin in the pineal gland. Melatonin is secreted at night, and induces sleep by inhibiting the brain mechanisms that promote wakefulness. The pineal and the SCN function jointly as endogenous pacemakers in the brain.

3. Vetter et al. (2011) investigated the importance of light in the regulation of the sleep–wake and activity–rest patterns. One group of participants remained in normal ‘warm’ artificial light for five weeks, while a second group experienced artificial ‘blue-enriched’ light similar to daylight. All of the participants kept a daily sleep log and wore devices that measured their movement over each 24-hour period. The results showed that the first group synchronised their circadian rhythms each day with the natural light of dawn. However, the second group synchronised their rhythms to office hours. This finding confirms the view that light is the dominant zeitgeber for the SCN and that its effectiveness depends on its spectral composition.

4. Endogenous pacemakers are mechanisms within the body that govern internal, biological bodily rhythms. In mammals, the main endogenous pacemaker is a tiny cluster of nerve cells called the suprachiasmatic nucleus (SCN), which lies in the hypothalamus. The SCN plays an important part in generating the body’s circadian rhythm, and acts as a ‘master clock’, which links to other brain regions that control sleep and arousal. The SCN also regulates the manufacture and secretion of melatonin in the pineal gland. Melatonin is secreted at night, and induces sleep by inhibiting the brain mechanisms that promote wakefulness. The pineal and the SCN function jointly as endogenous pacemakers in the brain.

Exogenous zeitgebers are environmental cues that help to regulate an organism’s biological clocks. The most important zeitgeber for most animals is light. Receptors in the SCN are sensitive to changes in light levels during the day and use this information to synchronise the activity of the body’s organs and glands. Light resets the internal biological clock each day, keeping it on a 24-hour cycle. Rods and cones in the retina of the eye detect light to form visual images. A protein called melanopsin, which is sensitive to natural light, is critical in this system. A small number of retinal cells contain melanopsin and carry signals to the SCN to set the daily body cycle.
The importance of the SCN as an endogenous pacemaker has been demonstrated in studies of non-humans. Morgan (1995) bred hamsters so that they had abnormal circadian rhythms of 20 hours rather than 24 hours. When SCN neurons from these hamsters were transplanted into normal hamsters, the normal hamsters displayed the same abnormal circadian rhythm. Confirmation of the SCN’s role came when SCN neurons from normal hamsters were planted into the abnormal hamsters’ brains. The recipient hamsters changed to a circadian pattern of 24 hours.

Support for the role of melanopsin in setting the circadian rhythm comes from studies of blind people. Some blind people are still able to reliably entrain their circadian rhythm in response to light and Skene and Arendt (2007) estimate that the vast majority have normally entrained circadian rhythms. This suggests that the pathway from retinal cells containing melanopsin to the SCN is still intact.

Burgess et al. (2003) showed how light can effect the sleep–waking cycle. They exposed volunteers to light treatments in order to shift their sleep–wake cycle. Participants’ sleep patterns were measured, and participants exposed to continuous bright light shifted their circadian rhythm by 2.1 hours over the course of the study. As a result, these participants in the first treatment group felt sleepier 2 hours earlier in the evening and woke 2 hours earlier in the morning.

Vetter et al. (2011) investigated light’s importance in regulating the sleep–wake and activity–rest patterns. One group of participants remained in normal ‘warm’ artificial light for five weeks, while a second group experienced artificial ‘blue-enriched’ light similar to daylight. The first group synchronised their circadian rhythms each day with the natural light of dawn. However, the second group synchronised their rhythms to office hours. This indicates that light is the dominant zeitgeber for the SCN and that its effectiveness depends on its spectral composition.

One problem with this research is that normally the SCN coordinates all other bodily rhythms. However, sometimes these rhythms become out of step with each other. Folkard (1996) had a volunteer spend 25 days in the controlled environment of a laboratory. The participant had no access to daylight or other zeitgebers that might have reset the SCN. At the end of the 25 days her core temperature rhythm was still at 24 hours. However, her sleep–wake cycle had extended to 30 hours, with periods of sleep as long as 16 hours being recorded.

Chapter 7

Some suggested answers to the ‘Can you?’ questions in the Fourth edition AS Complete Companion book are given here. Often there is no single ‘right’ answer. In some cases ‘e.g.’ has been included in the answer but even where this is not given you may assume that there could be other, perfectly correct, answers.

Page 179 No. 7.1

1. An experiment is a method that allows causal connections to be drawn. An independent variable is deliberately manipulated and its causal effects on a dependent variable are observed.

2. An aim is an intention or possibly a research question (such as ‘Does noise affect the quality of work?’), whereas a hypothesis is a statement of the relationship between the independent and dependent variable (such as ‘Students who do a memory task with the TV on produce work which gets fewer marks.’).

3. Operationalisation means ensuring that variables are in a form that can be easily tested. For example, a concept such as ‘educational attainment’ needs to be specified more clearly if it is going to be investigated. It could, perhaps, be operationalised as ‘GCSE grade in Maths’.

4. Standardisation is important because the researcher needs to make sure that each participant does exactly the same thing in each condition, otherwise the results might vary because of changes in procedure rather than because of the IV.
Page 181 No. 7.2

1. In Harlow’s (1959) study of attachment, the cloth-covered and wire surrogate mothers had different heads. The different heads acted as a confounding variable, because they varied systematically with the independent variable (i.e. the ‘mother’ being cloth-covered or not).

2. It is important to control extraneous variables because they are ‘nuisance’ variables that affect the dependent variable, but not in a systematic way.

3. An extraneous variable does not vary systematically with the independent variable. It does not act as an alternative independent variable, but may have an effect on the dependent variable. A confounding variable does vary systematically with the independent variable. It therefore can act as an alternative variable that affects the dependent variable.

Page 183 No. 7.3

1. A pilot study is conducted in order to find out if certain aspects of the design, such as the instructions that participants will be given, do or don’t work.

2. A pilot study might be used to ensure that the instructions participants will be given can be easily understood or to see if the task is too difficult or too easy.

3. A pilot study might be conducted by recruiting a few people from the target population. The researcher would go through the standardised procedures as planned. At the end participants would be debriefed.

4. A directional hypothesis states the expected direction of the results, such as ‘people who sleep well do better on class tests’. A non-directional hypothesis states that there is a difference between two conditions, but does not state the direction of the results, such as ‘people who sleep well do differently on class tests’.

5. Researchers use a non-directional hypothesis when there is no past research or past research is contradictory. Non-directional hypotheses may be more appropriate if a study is exploring a new area, where informed expectations about how people might behave have yet to be established through research.

Page 185 No. 7.4

1. An independent groups design is one where participants are allocated to two (or more) groups representing different levels of the IV. Allocation is usually done using random techniques.

2. One other type of experimental design is the repeated measures design. It might be used in a study to see if reaction times differ before and after drinking coffee.

3. Using a matched pairs design to study minority influence could be very time-consuming and difficult because participants would need to be matched on all possible variables that might exert an influence. You would first of all have to work out what characteristics might be important confounding variables (such as age, gender, intelligence, confidence) and match participants on these variables.

Page 187 No. 7.5

1. A laboratory experiment is an experiment conducted in a special environment (the laboratory) where variables can be carefully controlled. The researcher manipulates the independent variable and measures the dependent variable.

2. A field experiment is a controlled experiment conducted in any environment outside of the laboratory. The researcher manipulates the independent variable and measures the dependent variable.
3. One difference between a laboratory and field experiment is that the laboratory experiment is conducted in a special environment whereas the field experiment is conducted in any environment outside of the laboratory. A second difference is that in a laboratory experiment participants are aware that they are taking part in an experiment whereas in a field experiment they are usually not aware of this.

4. One similarity between a laboratory and field experiment is that in both cases an independent variable is manipulated by the experimenter.

5. A laboratory experiment is an experiment conducted in a special environment (the laboratory) where variables can be carefully controlled. An example of a laboratory experiment is Loftus and Palmer’s (1974) study of eyewitness memory. A field experiment is a controlled experiment conducted in any environment outside of the laboratory. An example of a field experiment is Johnson and Scott’s (1976) study of the weapons focus.

Both types of experiment have their advantages and disadvantages. For example, laboratory experiments have a high degree of control, which increases the validity of the study. However, participants are aware that they are being studied, which leads to demand characteristics, and this reduces validity. Field experiments have less control but the fact that participants aren’t aware of being studied may mean their behaviour is more natural.

Both kinds of experiment are good because the independent variable is manipulated deliberately, which makes it possible to draw causal conclusions.

Page 189 No. 7.6

1. In a natural experiment the independent variable has not been manipulated by the experimenter. It may be conducted in a laboratory or in the field.

2. In a quasi-experiment, the independent variable is not actually something that varies at all. It is a naturally occurring difference between people that exists. The dependent variable in a quasi-experiment may be measured in a laboratory.

3. In a field experiment, the independent variable is manipulated by an experimenter. In a natural experiment, the independent variable is not manipulated by the experimenter, and varies ‘naturally’.

4. A natural experiment is an experiment in which the independent variable has not been manipulated by the experimenter. The dependent variable may be measured in a laboratory or in the field. The key feature of a natural experiment is not where it is conducted but the way the independent variable is manipulated.

An example of a natural experiment is Charlton et al.’s (2000) study looking at whether the introduction of TV to a remote island influenced pro- and anti-social behaviour. Natural experiments such as Charlton et al.’s have the advantage of allowing researchers to study independent variables that cannot be manipulated for ethical or practical reasons. In this case it would not be possible to raise children and stop them watching TV and then introduce them to TV.

Natural experiments also enable psychologists to study ‘real’ problems such as the effects of institutionalisation as in the case of Rutter’s research on Romanian orphans. The independent variable was lack of early attachments that could not be manipulated by a researcher because it would be unethical.

However, natural experiments cannot demonstrate causal relationships, because the independent variable has not been directly manipulated. This means that it is not possible to draw causal conclusions from these types of experiment.

Page 191 No. 7.7

1. A demand characteristic is a cue that makes participants unconsciously aware of the aims of a study or helps participants work out what the researcher expects to find.
2. An investigator effect is anything that an investigator does that has an effect on a participant’s performance in a study, other than what was intended. An example is when an experimenter unconsciously encourages some participants by being more positive with them than with other participants.

3. One way to deal with demand characteristics is to use a single blind design. In this, participants are not aware of the research aims and/or which condition of the experiment they are receiving. This prevents them from seeking cues about the aims or reacting to them.

Page 193 No. 7.8

1. A population is the group of people that a researcher is interested in. A sample is a selection of people from that population.

2. A volunteer sample is one that relies solely on people who select themselves as participants in a study. One way this kind of sample can be obtained is by advertising in a newspaper or a noticeboard.

3. Bias arises in opportunity sampling because the sample is drawn from a small part of the population. For example, an opportunity sample selected from people walking around a town centre on a Monday would be unlikely to include professional people, because they would be at work.

4. Generalisation means applying the findings obtained in a research study to the general population.

5. One limitation of volunteer sampling is that the sample is likely to be biased, because people who volunteer as participants are likely to be psychologically different from those who do not e.g. they may be keen to help and more affected by demand characteristics.

Page 195 No. 7.9

1. Situations where apparent harm might be acceptable are those in which the risk of harm is no greater than participants would be likely to experience in ordinary life, and if participants are in the same state after a study as they were before, unless they have given their informed consent to be treated otherwise. Milgram (1974) claimed that the stress on participants was no greater than they would experience in everyday life and that is why he continued.

2. One ethical issue in psychological research is privacy. This is an issue because there are situations in which people do not expect to be observed by others, such as when they are in the privacy of their own homes.

3. The role of the Code of Ethics and Conduct (BPS, 2009) is to ensure that there is a balance between what the researcher needs to do in order to conduct meaningful research, and the rights of participants. The British Psychological Society (BPS) identifies four ethical principles for researchers, namely respect, competence, responsibility, and integrity.

   Respect for the dignity of people includes standards of privacy, confidentiality, informed consent, and the avoidance of deception unless it is absolutely necessary and its use is disclosed to participants at the earliest opportunity. It also includes a participant's right to withdraw from research at any time.

   As well as respect, the code tries to ensure that psychologists maintain high standards in their professional work (competence). This is clearly necessary, if psychology is to avoid being criticised by the wider community.

   This is why the code also makes reference to responsibility, and specifically states that psychologists have a responsibility to their clients, the general public, and to the science of psychology itself.

   Finally, the code states that psychologists should be honest and accurate, which includes reporting research findings accurately and bringing instances of misconduct by other psychologists to the attention of the BPS. All of these principles are aimed at ensuring that psychology is a credible discipline.
4. One ethical issue is informed consent. This means that participants must be told the true aim of a study and what is actually going to happen. They must be given sufficient information about what is involved to be able to make an informed decision about whether to participate.

However, revealing the details may mean that participants guess the aims of the study, and so researchers may not always want to reveal the true aim of the study. Even if the researchers have sought and obtained informed consent, that does not guarantee that participants really do understand what they have let themselves in for. In Zimbardo's prison experiment, for example, participants gave informed consent, but they did not know the amount of psychological distress that would be caused by participating.

It can be necessary, from the researcher’s point of view, to deceive participants about the true nature of the research, otherwise the participants may change their behaviour and the study could be meaningless. Craik and Lockhart (1972) conducted a study on memory where the participants were not informed of the true aims of the study, which was to compare deep with shallow processing; the participants were not told that they would have to recall the words. From the participant’s point of view, deception is unethical and it prevents them from being able to give informed consent. However, in the case of this memory study the harm of deception may be considered to be minor.

If participants begin to feel uncomfortable or distressed they must be allowed to leave. This is especially important if they have been deceived about the true nature of the study. Sometimes the right to withdraw is compromised by payment of participants, or some other reward, and in such cases, the participants might feel less able to withdraw. Milgram’s prompts to the participants to continue in his obedience studies are likely to have made them feel less able to withdraw. From the researcher’s point of view, if participants do leave during the study, this will bias the results because the participants who stayed are more likely to be obedient or they might be more hardy, leading to a biased sample.

Extra AO3 material for 16-mark A Level answers

It is important that no harm, either physical or psychological, should come to participants during a study. It is considered acceptable if the risk of harm is no greater than would be expected in everyday life or if participants are in the same state after the study as they were before. However, studying some of the more important questions in psychology can cause distress to participants and it is difficult to predict the outcome of some procedures. Zimbardo, for example, did not expect that participants would become as distressed as they did.

The Data Protection Act makes confidentiality a legal right and it is only acceptable for personal data to be recorded if it is presented anonymously. However, it can be difficult to protect confidentiality because even though the researcher promises anonymity, it may be obvious who is involved in a study. For example, knowing that a study of children in a hospital was conducted in a certain place could permit some people to identify participants because the target group has been narrowed down.

Page 197 No. 7.10

1. One way to deal with ethical issues in psychological research is to use a cost–benefit analysis. This judges the cost of doing the research against the benefits. The costs and benefits may be judged from the participants’ point of view, where things like distress and loss of time may be listed, versus payment for participation and a feeling of having contributed to scientific research. We can also judge costs and benefits in terms of society at large and then we can consider the value in improving people’s lives versus the possibility that individuals may be harmed in the process.

2. One way to deal with the issue of deception is to seek approval by an ethics committee. This involves weighing up the benefits of the study against the costs to participants. When deception is used, participants should be fully debriefed after the study has been completed. A cost–benefit analysis could be applied to Milgram’s studies of obedience, where the costs to the participants of undergoing the procedure would be weighed against the benefits of the research informing us about why people obey authority figures.
However, cost–benefit decisions are flawed because they involve subjective judgements, and the costs and/or benefits of the study are not always apparent until after it has been completed. Although participants are debriefed after a study, deception can’t turn the clock back – participants may still feel embarrassed or have lowered self-esteem as a result of being in the study.

In informed consent, participants are asked to formally indicate their agreement to participate by, for example, signing a document that contains comprehensive information concerning the nature and purpose of the research, and their role in it. One weakness of this is that if a participant is given full information about a study, this may invalidate its purpose. Additionally, even if researchers have obtained informed consent, it is not guaranteed that participants really do understand what they have let themselves in for. In Zimbardo’s research, for example, the participants gave informed consent, but the study was far more harmful to them than they could ever have imagined it would be.

The right to withdraw is dealt with by informing participants at the beginning of the study that they can leave the study at any time. In Zimbardo’s studies, the participants could have withdrawn their participation, but they may have felt that they couldn’t, because that would have spoiled the study. Additionally, because the participants were paid to take part, they might not have felt that they had the right to withdraw.

Extra AO3 material for 16-mark A Level answers

The BPS and APA codes of conduct take a ‘rules and sanctions’ approach to dealing with ethical issues, through the use of codes of conduct. These identify which behaviours are not acceptable and give guidelines on how to deal with ethical dilemmas. However, this approach is rather general because it is virtually impossible to cover every conceivable situation that a researcher could encounter. In Canada, they take a slightly different approach and present a series of hypothetical dilemmas and invite psychologists to discuss these. The strength of this approach is that it encourages debate whereas the BPS’ approach tends to close off discussions about what is right or wrong.

The problem with cost–benefit analysis is that it is nearly impossible to predict either costs or benefits prior to conducting a study, or even after it. It is hard to quantify things like distress. It has also been argued that the cost–benefit approach could be said to legitimise unethical practices. For example, it suggests that deception and harm are acceptable in many situations provided the benefits are high enough.

Page 199 No. 7.11

1. In participant observation, the observer becomes part of the group that is being observed. An observer might, for example, ‘become’ a football hooligan in order to study hooliganism.

2. In a naturalistic observation, the observer does not interfere in any way but merely observes the behaviour(s) in question. In a controlled observation, behaviour is observed under conditions where certain variables have been organised by the researcher. Either kind of study may take place in a ‘natural’ environment.

3. One ethical issue relating to covert observation is that those being observed have not given their informed consent. This means that they have not agreed beforehand to be participants in the study and this is an invasion of their privacy.

4. One limitation of using non-participant observation is that the observer may lack insight into what the behaviours of the group mean. One strength is that non-participant observers are more likely than participant observers to be more objective, because they are not part of the group being observed.
Page 201 No. 7.12

1. In time sampling, the observer records behaviours in a given time frame, such as noting what a target individual is doing every 15 seconds. For example, the observer may have a checklist of behavioural categories and tick whichever of these is occurring every 15 seconds.

2. Event sampling involves keeping a count of the number of times a certain behaviour (event) occurs, whereas time sampling involves recording those behaviours in some given time frame, such as every 15 seconds.

3. Behavioural categories involve dividing a target behaviour into a subset of specific and operationalised behaviours. For example, when observing infant behaviour there could be a list of things such as smiling, crying, sleeping, and so on. This could be placed on a behavioural checklist and then the observer uses event sampling to tick each category when it is observed.

Page 203 No. 7.13

1. Self-report techniques involve asking people questions about their experiences and/or beliefs. They are called self-reports because people report their own thoughts/feelings.

2. With a questionnaire, data are collected through the use of written questions. By contrast, an interview involves face-to-face, ‘real-time’ interaction between two people and results in the collection of data.

3. In a structured interview, the questions that will be asked are decided in advance, whereas in an unstructured interview the interviewer starts with some general aims and possibly some questions, but the interviewee’s answers guide subsequent questions.

4. One limitation of using a questionnaire rather than a structured interview is that questionnaires can only be completed by people who can read and write and who are also willing to spend time filling them in. This means that the sample is biased.

Page 205 No. 7.14

1. One issue that is important in questionnaire construction is clarity. Questions need to be written in an unambiguous way so that the reader understands what is being asked. A second issue is analysis. Questionnaires need to be written in such a way that the answers are easy to analyse.

2. One issue that is important in the design of interviews is clarity. Questions need to be asked in an unambiguous way so that interviewees understand what is being asked of them. A second issue is bias. Any bias in a question might lead interviewees to be more likely to give a particular answer, as is the case with ‘leading questions’.

3. Closed questions have a limited range of answers from which participants choose one. This type of question tends to produce quantitative data. Open questions invite participants to provide their own answers rather than select one of those provided. This type of question tends to produce qualitative data.

4. One strength of using closed questions in an interview is that because participants have a limited range of answers, their responses are easier to analyse using graphs and measures like the mean.

Page 207 No. 7.15

1. A zero correlation means that there is no relationship at all between the two variables that have been measured.

2. An experiment is a study of cause and effect, in which a researcher is able to see if an independent variable has an effect on a dependent variable. However, in correlations the variables are simply measured, and no deliberate change is made. This means that no causal conclusions can be drawn.
3. This is a positive correlation, because it indicates that low, medium and high scores on one variable are associated with low, medium and high scores on the other.

4. A negative correlation means that as one variable increases, the other one decreases. Therefore, a high score on one variable is associated with a low score on the other.

**Page 209 No. 7.16**

1. One example of a meta-analysis was conducted by Köhnken et al. (1999). They meta-analysed 53 studies related to the cognitive interview technique and found it was more effective compared with the standard interview technique.

2. One limitation of meta-analysis is that the research designs in the different studies sampled may vary considerably, which means that the studies are not truly comparable. Putting them all together may therefore lead to a misleading conclusion being drawn.

3. A case study is a research investigation that involves a detailed study of a single individual, institution, or event. It uses information from a range of sources (such as the person concerned) and a variety of techniques (such as interviews).

**Page 211 No. 7.17**

1. $3/8 = 37.5\%$. To two significant figures, this is 38%.

2. $4,526$ divided by $42$ is close to $4,200$ divided by $42$ which is $100$. Since $4,526$ is larger than $4,200$ the answer will be slightly bigger than $100$. It is, in fact, $107.8$.

3. $0.02$ as a fraction is $2/100$, or $1/50$.

4. It means that ‘the number of girls is less than the number of boys’.

**Page 213 No. 7.18**

1. One measure of central tendency is the mean. It is calculated by adding up all the data items and dividing by the number of data items.

2. One advantage of using the mean is that it takes account of exact distance between all the values of all the data. One disadvantage of the mean is that it can be easily distorted by one (or a few) extreme values, and thus end up being misrepresentative of the data as a whole.

3. One measure of dispersion is the range. It is the difference between the highest and lowest values in a data set, with 1 added. For example, if the highest value is 20 and the lowest is 5, the range is $20 - 5 + 1 = 16$.

4. It is sometimes preferable to use the mode instead of the mean because the mean can be easily distorted by one or more extreme values. Since the mode is defined as the most frequently occurring value, it is not affected by extreme values.

5. The range is also affected by extreme values, and fails to take into account the distribution of the numbers, such as whether they are closely grouped around the mean or spread out evenly. The standard deviation is more precise because all the exact values are taken into account.

**Page 215 No. 7.19**

1. In a bar chart, a space is left between each bar to indicate a lack of continuity whereas on a histogram there are no gaps between the bars because the horizontal axis is continuous. Also, there is no true zero on a bar chart whereas there is on a histogram.

2. A normal distribution curve is a symmetrical bell-shaped frequency distribution. The data are distributed in such a way that most of the scores are clustered close to the mid-point. The mean, median and mode all lie at this mid-point.
3. A normal distribution is symmetrical and the mean, median and mode are in the centre. However, in a skewed distribution one of the tails is longer than the other, indicating that there are a number of extreme values to one side or the other of the mid-score. The mean, median and mode are not the same.

**Page 217 No. 7.20**

1. Quantitative data is behaviour measured in numbers or quantities. For example, counting the number of students in a psychology class produces quantitative data as does counting the number of male and female teachers who work at a particular school.

2. One strength of producing qualitative data in a questionnaire is that it can provide unexpected insights into thoughts and behaviour because the answers are not restricted by previous expectations.

3. Primary data is information observed or collected directly from first-hand contact. It differs from secondary data, which uses information that was collected by someone else, or for a purpose other than the current one.

**Page 219 No. 7.21**

1. \( N \) stands for the total number of participants.

2. The calculated value of \( S \) is the value that is obtained when the sign test has been used to analyse data, whereas the critical value of \( S \) is the value that appears in a table that researchers use to compare their calculated value with in order to draw a conclusion about the significance of the data.

3. 5% as a decimal is 0.05.

4. A sign test is used when a researcher is looking for a difference between two conditions and has used either a repeated measures or a matched pairs design.

**Page 221 No. 7.22**

1. Peer review is essential to the scientific process because it involves judging the scientific quality of research prior to it being published. It is in the interest of all scientists that their work is held up for scrutiny and any work that is flawed or fraudulent is detected and the results of such research are ignored.

2. One criticism of peer review is that it isn’t always possible to find an appropriate peer to review a piece of research. This means that poor research may be passed because it was not reviewed by someone who is an expert in that field.

   A second criticism is the anonymity of reviewers can sometimes lead to ‘old scores’ being settled between researchers.

**Page 223 No. 7.23**

1. One example of how psychological research has been used to benefit the economy is the findings from research into the cognitive interview. A review by Köhnken et al. (1999) found a 34% increase in the amount of correct information generated using the cognitive interview instead of the standard methods. This has shown that the cognitive interview is a much better way of obtaining accurate eyewitness testimony than standard interview techniques. The implication for the economy is that it reduces the expense of wrongful arrests and ensures that criminals are caught.

2. One of the implications of psychological research for the economy is that it has led to a better understanding of people’s behaviour in their economic lives. The field of ‘behavioural economics’ is primarily concerned with the rationality (or irrationality) of decisions relating to economics. Understanding the systematic biases caused by people’s irrational thinking is important in
improving our personal lives as well as the fabric of our society. According to Layard (2014) research into understanding irrational thinking has transformed business, and has been applied to many endeavours, including mental health problems, financial advice, and government programmes.

This is supported by the McCrone report, which estimated the direct costs of mental health in England at around £22.5 billion a year – that includes spending in health and social care and a variety of other agencies, but not the indirect costs of the impact on the criminal justice system and in lost employment. The report commented on the use of drugs versus psychotherapies, and concluded that drug medication provided a much greater economic gain than psychological therapies, because the latter are far more expensive. This shows that evidence-based research on effective drug therapies can be important in reducing costs and helping people return to work.