

## A-level PSYCHOLOGY

### Paper 3 Issues and options in psychology

---

Thursday 15 October 2020

Morning

Time allowed: 2 hours

#### Materials

For this paper you must have:

- an AQA 16-page Answer Book.

You may use a calculator.

#### Instructions

- Use black ink or black ball-point pen.
- Write the information required on the front of your answer book. The **Paper Reference** is 7182/3R.
- In **Section A**, you should answer **all** questions.
- In **Section B**, choose **one** topic. Answer **all** questions on the topic you choose.
- In **Section C**, choose **one** topic. Answer **all** questions on the topic you choose.
- In **Section D**, choose **one** topic. Answer **all** questions on the topic you choose.
- Do all rough work in your answer book. Cross through any work you do not want to be marked.

#### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 96.
- You will be marked on your ability to:
  - use good English
  - organise information clearly
  - use specialist vocabulary where appropriate.

---

**There are no questions printed on this page**

---

**Section A****Issues and debates in psychology**

Answer **all** questions in this section.

---

|   |   |
|---|---|
| 0 | 1 |
|---|---|

Outline what is meant by cultural relativism.

[2 marks]

|   |   |
|---|---|
| 0 | 2 |
|---|---|

Suggest **two** ways in which researchers might reduce cultural bias in their research.

[2 marks]

|   |   |
|---|---|
| 0 | 3 |
|---|---|

Jonny is 25 years old. He is a very anxious person. Colleagues tease him at work because he chews his pen all the time and spends hours tidying his desk. He finds it difficult to make friends and has never had a girlfriend.

Use your knowledge of psychic determinism to explain Jonny's behaviour.

[4 marks]

|   |   |
|---|---|
| 0 | 4 |
|---|---|

'Psychologists sometimes adopt a reductionist approach to their investigations when they want their research to be objective and empirical.'

Discuss reductionism in psychological research. Refer to the statement above in your answer.

[16 marks]

**Turn over for Section B**

**Turn over ►**

---

**Section B****Relationships or Gender or Cognition and development**

Choose **one** topic from **Section B**. Answer **all** questions on the topic you choose.

---

**Topic: Relationships**

---

|   |   |
|---|---|
| 0 | 5 |
|---|---|

Which **one** of the following best describes social exchange theory? Write the correct letter in your answer book.

[1 mark]

- A** A theory that proposes individuals focus on balancing effort and gain.
- B** A theory that proposes individuals focus on cost rather than reward.
- C** A theory that proposes individuals focus on getting out more than they put in.
- D** A theory that proposes individuals focus on how much has been contributed so far.

In a study of filter theory, a psychology student used a group of female participants. Each participant was shown two descriptions.

- Description 1 described a man with a similar social background to that of the female participants.
- Description 2 described a man with a different social background to that of the female participants.

The student asked participants to judge how much they liked each description on a scale of 1–10.

The student decided to test for a significant difference between the judgements made for each description. He proposed using an unrelated t-test to analyse the data.

|   |   |
|---|---|
| 0 | 6 |
|---|---|

Suggest a more appropriate statistical test of difference for the student to use with this data. Explain **two** reasons for your choice based on the description of the study.

[5 marks]

|   |   |
|---|---|
| 0 | 7 |
|---|---|

The student who carried out the study selected the two descriptions. He decided himself which social backgrounds were similar and which social backgrounds were different.

Explain how the study could be improved by selecting the descriptions another way.

[2 marks]

|   |   |
|---|---|
| 0 | 8 |
|---|---|

Discuss the filter theory of attraction. Refer to the likely outcome of the student's study in your answer.

[8 marks]

|   |   |
|---|---|
| 0 | 9 |
|---|---|

Outline Rusbult's model of romantic relationships. Explain **one or more** strength(s) of Rusbult's model.

[8 marks]

---

**Topic: Gender**

---

|   |   |
|---|---|
| 1 | 0 |
|---|---|

Which **one** of the following best describes Kohlberg's gender stability stage? Write the correct letter in your answer book.

[1 mark]

- A** Knowing what gender you are now and believing that your gender is stable in different contexts and across different situations.
- B** Knowing what gender you are now and understanding that you have always been the same gender and will stay the same gender in the future.
- C** Knowing what gender you are now but thinking that you were a different gender in the past and could be a different gender in the future.
- D** Knowing what gender you are now but wanting to be a different gender at different times and in different situations.

In a study of sex-role stereotypes and the understanding of gender, a psychology student used a group of 7-year-old children. Each child was shown two pictures.

- Picture 1 showed people carrying out sex-stereotypical activities.
- Picture 2 showed people carrying out non-sex-stereotypical activities.

The student asked the children to say how much they liked each picture on a scale of 1–10.

The student decided to test for a significant difference between the judgements of the two pictures. He proposed using an unrelated t-test to analyse the data.

|   |   |
|---|---|
| 1 | 1 |
|---|---|

Suggest a more appropriate statistical test of difference for the student to use with this data. Explain **two** reasons for your choice based on the description of the study.

[5 marks]

**Section B continues on the next page**

**Turn over ►**

|   |   |
|---|---|
| 1 | 2 |
|---|---|

The student who carried out the study selected the two pictures. He decided himself which were sex-stereotypical activities and which were non-sex-stereotypical activities.

Explain how the study could be improved by selecting the pictures another way.

[2 marks]

|   |   |
|---|---|
| 1 | 3 |
|---|---|

Discuss sex-role stereotypes. Refer to the likely outcome of the student's study in your answer.

[8 marks]

|   |   |
|---|---|
| 1 | 4 |
|---|---|

Outline Bem's research into androgyny. Explain **one or more** limitation(s) of Bem's research.

[8 marks]

---

### Topic: Cognition and development

---

|   |   |
|---|---|
| 1 | 5 |
|---|---|

Which **one** of the following best describes Piaget's concept of conservation? Write the correct letter in your answer book.

[1 mark]

- A** Understanding that things are different even though they look the same.
- B** Understanding that things are different when they look different.
- C** Understanding that things are the same even though they look different.
- D** Understanding that things are the same when they look the same.

In a study of perspective-taking, a psychology student used a group of 9-year-old children. Each child was shown two pictures.

- Picture 1 showed an older child being unkind to a little boy.
- Picture 2 showed an older child being kind to a little boy.

The student asked the children to judge how sad the little boy would feel in each picture on a scale of 1–10.

The student decided to test for a significant difference between the judgements of the two pictures. He proposed using an unrelated t-test to analyse the data.

|   |   |
|---|---|
| 1 | 6 |
|---|---|

Suggest a more appropriate statistical test of difference for the student to use with this data. Explain **two** reasons for your choice based on the description of the study.

[5 marks]

|   |   |
|---|---|
| 1 | 7 |
|---|---|

The student who carried out the study selected the two pictures. He decided himself which picture showed unkind behaviours and which picture showed kind behaviours.

Explain how the study could be improved by selecting the pictures another way.

**[2 marks]**

|   |   |
|---|---|
| 1 | 8 |
|---|---|

Discuss Selman's research on perspective-taking. Refer to the likely outcome of the student's study in your answer.

**[8 marks]**

|   |   |
|---|---|
| 1 | 9 |
|---|---|

Outline Vygotsky's theory of cognitive development. Explain **one or more** strength(s) of Vygotsky's theory.

**[8 marks]**

**Turn over for Section C**

**Turn over ►**

---

**Section C****Schizophrenia or Eating behaviour or Stress**

Choose **one** topic from **Section C**. Answer **all** questions on the topic you choose.

---

**Topic: Schizophrenia**

---

**2 0** Briefly outline and evaluate **one** study of validity in relation to diagnosis of schizophrenia. **[4 marks]**

**2 1** Martine has schizophrenia. She is afraid because she believes that her care workers are trying to hurt her. She hears voices telling her to lock the doors and windows so the care workers cannot get into her house. She thinks about nothing else.

Explain how a cognitive behaviour therapist might treat Martine's symptoms. **[4 marks]**

**2 2** Outline **one or more** biological explanation(s) for schizophrenia. Compare biological explanation(s) for schizophrenia with the family dysfunction explanation for schizophrenia. **[16 marks]**

---

**Topic: Eating behaviour**

---

**2 3** Briefly outline and evaluate **one** study of taste aversion. **[4 marks]**

**2 4** Charlene wants to be skinny like a super-model. She is dieting, eating very few calories. She has tried dieting before but always puts the weight back on afterwards. She thinks about food all the time and rewards herself occasionally by eating a giant pizza with chips.

Explain why Charlene's dieting might not be successful. **[4 marks]**

**2 5** Outline **one or more** biological explanation(s) for anorexia nervosa. Compare biological explanation(s) for anorexia nervosa with the family systems explanation for anorexia nervosa. **[16 marks]**

---

**Topic: Stress**

---

|   |   |
|---|---|
| 2 | 6 |
|---|---|

Briefly outline and evaluate **one** study of immunosuppression.

**[4 marks]**

|   |   |
|---|---|
| 2 | 7 |
|---|---|

Nadine has a busy job and is very stressed most of the time. When she thinks about work at night she feels her heart pounding very fast. She often feels anxious and is experiencing frequent headaches.

Explain how a biofeedback therapist might help Nadine manage her stress.

**[4 marks]**

|   |   |
|---|---|
| 2 | 8 |
|---|---|

Outline **one or more** self-report measure(s) of stress. Compare self-report measure(s) of stress with physiological measures of stress.

**[16 marks]**

**Turn over for Section D**

**Turn over ►**

---

**Section D****Aggression or Forensic psychology or Addiction**

Choose **one** topic from **Section D**. Answer **all** questions on the topic you choose.

---

**Topic: Aggression**

---

- 2 9** Describe neural mechanisms in aggression. **[6 marks]**
- 3 0** Jane is talking about her husband to a friend.
- Jane says, "Bill gets angry if I text any of my male friends. He's always looking at my mobile phone. He gets upset if I want to go out with friends and insists on coming along too. I suppose it is nice in a way because he is so strong and protective."
- Use your knowledge of evolutionary explanations of aggression to explain Jane's comments. **[4 marks]**
- 3 1** Outline **one** strength **and one** limitation of evolutionary explanations of aggression. **[6 marks]**
- 3 2** Discuss the frustration-aggression hypothesis as an explanation for human aggression. **[8 marks]**
- 

**Topic: Forensic psychology**

---

- 3 3** Describe psychodynamic explanation(s) for offending behaviour. **[6 marks]**
- 3 4** Peter is talking about his offending.
- Peter says, "I don't know why it happens. Sometimes when I hear people telling stupid jokes in a bar, I just get cross and punch them. I get into a rage and feel my pulse racing. If only I had another way of dealing with it. I just need to get used to controlling myself."
- Explain how an anger management therapist could help Peter. **[4 marks]**

---

|   |   |
|---|---|
| 3 | 5 |
|---|---|

 Outline **one** strength **and one** limitation of anger management as a way of dealing with offending.  

**[6 marks]**

|   |   |
|---|---|
| 3 | 6 |
|---|---|

 Discuss neural explanations for offending behaviour.  

**[8 marks]**

---

**Topic: Addiction**

---

|   |   |
|---|---|
| 3 | 7 |
|---|---|

 Describe how brain neurochemistry is involved in nicotine addiction.  

**[6 marks]**

|   |   |
|---|---|
| 3 | 8 |
|---|---|

 Bertie is talking about his addiction to chocolate.  

Bertie says, "I can't stop eating chocolate. I just need more and more. Eating chocolate gives me such a great feeling. I get comfy on the sofa then stuff myself with chocolate till I feel all warm and happy. I'm spending so much money on chocolate, I don't know what to do."

Explain how covert sensitisation could be used to treat Bertie's addiction.

**[4 marks]**

|   |   |
|---|---|
| 3 | 9 |
|---|---|

 Outline **one** strength **and one** limitation of covert sensitisation as a way of reducing addiction.  

**[6 marks]**

|   |   |
|---|---|
| 4 | 0 |
|---|---|

 Discuss cognitive bias as a way of explaining gambling addiction.  

**[8 marks]**

**END OF QUESTIONS**

---

**There are no questions printed on this page**

**Copyright information**

For confidentiality purposes, all acknowledgements of third-party copyright material are published in a separate booklet. This booklet is published after each live examination series and is available for free download from [www.aqa.org.uk](http://www.aqa.org.uk).

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team.

Copyright © 2020 AQA and its licensors. All rights reserved.



|   |   |
|---|---|
| 0 | 1 |
|---|---|

Cultural relativism is the idea that a behaviour can only be properly understood, and judged as normal or abnormal, in the context of the norms and values of the society or culture in which it occurs. So the standards of one culture should not be applied as universal norms to judge behaviour in other cultures.

|   |   |
|---|---|
| 0 | 2 |
|---|---|

First, use researchers who are native to, or immersed in, the culture being investigated, so behaviour is interpreted according to that culture's own norms rather than the researcher's.

Second, carry out cross-cultural research with samples from many cultures rather than a single culture, and do not generalise findings to cultures that were not represented in the sample.

|   |   |
|---|---|
| 0 | 3 |
|---|---|

Psychic determinism is Freud's view that all adult behaviour is caused by unconscious drives and conflicts rooted in early childhood experiences during the psychosexual stages, so Jonny has no free will and his behaviour is not accidental.

Jonny's pen-chewing suggests an oral fixation: he may have been frustrated or overindulged during the oral stage, so as an adult he seeks oral gratification. His hours spent tidying his desk suggest an anal-retentive personality, caused by harsh toilet training in the anal stage, making him obsessively neat and orderly. His difficulty making friends and never having had a girlfriend suggest unresolved conflicts that have stopped him forming mature heterosexual relationships in the genital stage.

Jonny is unaware of these causes because the memories have been repressed into his unconscious, but they show themselves in symbolic outward behaviours, and his anxiety reflects conflict between his id and

|   |   |
|---|---|
| 0 | 4 |
|---|---|

superego that his ego is struggling to manage.

Reductionism is the view that complex human behaviour and experience are best explained by breaking them down into smaller, simpler component parts. Explanations can be placed on different levels of explanation, from the most basic level (genes, neurons and neurochemicals), through the psychological level (cognitive processes), to the most complex, holistic level of social and cultural influences. Biological reductionism explains behaviour in terms of genes, brain structures and neurotransmitters. Environmental reductionism, used by behaviourists, explains all behaviour as stimulus-response links learned through classical and operant conditioning. Machine reductionism explains behaviour using mechanistic models such as computer analogies, and experimental reductionism reduces behaviour to single variables that can be operationalised and isolated in a laboratory. As the statement suggests, reductionism is closely linked to objectivity and empiricism. Objective research is not influenced by the researcher's opinions or expectations, and empirical research relies on direct observation and measurement. When behaviour is reduced to biological units, these can be measured objectively, for example levels of dopamine in schizophrenia or serotonin in depression can be assessed with brain scans or blood and urine samples. Behaviourists reduce learning to stimulus-response units, so they can manipulate a stimulus, such as the reinforcement given to a rat in a Skinner box, and directly observe and record the response. Similarly, cognitive psychologists reduce memory to separate processing units, such as the short-term and long-term stores in the multi-store model, which can be tested empirically in controlled experiments, for example by manipulating the delay before recall.

One strength of the reductionist approach is that it fits psychology's aim to be a science. Breaking behaviour into clearly defined variables means they can be operationalised and measured objectively, extraneous variables can be controlled, and cause and effect relationships can be established in experiments. Because the procedures are standardised, they can be replicated, so findings can be checked for reliability. This gives psychology greater scientific credibility, comparable to the natural sciences.

A further strength is that reductionist research has led to useful, effective treatments. For example, understanding depression at the level of serotonin led to SSRIs, and the effectiveness of such drugs can itself be tested empirically using randomised controlled trials against placebos, which benefits patients and the economy.

However, a major limitation is that reductionism can lead to a loss of meaning. Explaining depression simply as low serotonin ignores the meaning of the person's experience, such as a bereavement or loss of a job, and the components do not add up to the whole experience; as Gestalt psychologists argue, the whole is greater than the sum of its parts. This may explain why drug treatments do not work for everyone. Some behaviours, particularly social behaviours such as conformity or the behaviour of crowds, only make sense in the social context in which they occur, so studying isolated variables in a laboratory lacks ecological validity.

This contrasts with holism, the humanistic approach of Maslow and Rogers, which values studying the person as a whole using idiographic methods such as case studies, interviews and diaries. These give much richer, more meaningful qualitative data, but they are subjective and hard to test empirically. Psychologists therefore face a trade-off between objective, empirical methods and meaningful explanations. An interactionist approach,

*such as the diathesis-stress model, may be best, as it combines measurable biological factors with environmental and psychological ones, giving a fuller, more valid explanation of behaviour.*

|   |   |
|---|---|
| 0 | 5 |
|---|---|

*C*

|   |   |
|---|---|
| 0 | 6 |
|---|---|

*A Wilcoxon (signed ranks) test would be more appropriate.*

*Firstly, the same women judged both Description 1 and Description 2, so this is a repeated measures (related) design. An unrelated t-test is only appropriate for an independent groups design, where different participants are in each condition.*

*Secondly, the data are ratings of liking on a scale of 1 to 10, which are the women's subjective opinions. There is no fixed, equal unit of liking (a rating of 8 is not necessarily twice as much as a rating of 4), so the data are at the ordinal level of measurement rather than interval, and a non-parametric test is needed.*

*The Wilcoxon test is a test of difference for a related design with ordinal data, so it fits both features of the study.*

|   |   |
|---|---|
| 0 | 7 |
|---|---|

*The descriptions could be selected by an independent panel of raters (or a different researcher) who do not know the aim or hypothesis of the study, who would decide which social backgrounds are similar to, and which are different from, those of the participants.*

*This would remove the chance of researcher (investigator) bias in choosing descriptions that are likely to support the expected result, so the study would have greater internal validity.*

|   |   |
|---|---|
| 0 | 8 |
|---|---|

*Kerckhoff and Davis (1962) proposed that we choose romantic partners by passing potential partners through a series of filters, which narrow the 'field of availables' down to a 'field of desirables'. The first filter is social demography: at the outset we screen out people who differ from us in*

factors such as age, social class, education, ethnicity and location, partly because we are more likely to meet and interact with similar people. The second filter is similarity in attitudes and values, which is most important early in a relationship. The third, longer-term filter is complementarity, where we are attracted to partners whose traits and needs complement our own.

In the student's study, social background is an aspect of social demography, the first filter, so filter theory predicts that the female participants would be more attracted to a man from a similar background. The likely outcome is that they would give significantly higher liking ratings to Description 1 than to Description 2.

Kerckhoff and Davis's own longitudinal study of student couples supports the theory: attitude similarity predicted closeness in couples together for less than 18 months, while complementarity was more important in longer-term couples. Taylor (2010) also found that people tend to marry someone from their own ethnic group, supporting the social demography filter. However, this research is correlational, so cannot establish causality: partners may become more similar over time rather than choosing each other for similarity. The theory may also lack temporal validity, as modern society is highly mobile and diverse and online dating removes many physical and social constraints, so social demography may filter much less strongly than in 1962.

|   |   |
|---|---|
| 0 | 9 |
|---|---|

Rusbult's investment model (1983) extended social exchange theory by proposing that commitment is the key factor that keeps a romantic relationship going. Commitment depends on three factors. Satisfaction level is based on the rewards and costs of the relationship: we are satisfied

when rewards outweigh costs. Comparison with alternatives is whether another partner, or being single, would meet our needs better; better alternatives reduce commitment. Investment size is what we would lose if the relationship ended: intrinsic investments are resources put directly into the relationship, such as time, effort and emotion, and extrinsic investments are resources that arise from the relationship, such as children, mutual friends and possessions bought together. Commitment is highest when satisfaction is high, alternatives are poor and investment is large.

One strength is strong research support. Le and Agnew (2003) carried out a meta-analysis of 52 studies involving over 11,000 participants from five countries and found that satisfaction, comparison with alternatives and investment size all predicted commitment, and that commitment predicted whether relationships lasted. This was found across different cultures and in both heterosexual and homosexual relationships, so the model has good generalisability.

A second strength is that it explains why people stay in relationships that seem to offer few rewards, which social exchange theory cannot. Rusbult and Martz (1995) found that women at a shelter who had experienced abuse were more likely to return to their partner if they had made large investments, such as having children together, and had poor alternatives, even though their satisfaction was low. This shows that investment, not just satisfaction, determines commitment, so the model is an improvement on social exchange and equity theories and helps us to understand abusive relationships.

|   |   |
|---|---|
| 1 | 0 |
|---|---|

*B*

|   |   |
|---|---|
| 1 | 1 |
|---|---|

*A Wilcoxon (signed ranks) test would be more appropriate.*

*Firstly, the same children judged both Picture 1 and Picture 2, so this is a repeated measures (related) design. An unrelated t-test is only appropriate for an independent groups design, where different participants are in each condition.*

*Secondly, the data are ratings of liking on a scale of 1 to 10, which are the children's subjective opinions. There is no fixed, equal unit of liking (a rating of 8 is not necessarily twice as much as a rating of 4), so the data are at the ordinal level of measurement rather than interval, and a non-parametric test is needed.*

*The Wilcoxon test is a test of difference for a related design with ordinal data, so it fits both features of the study.*

|   |   |
|---|---|
| 1 | 2 |
|---|---|

*The pictures could be selected by an independent panel of raters (or a different researcher) who do not know the aim or hypothesis of the study, who would decide which activities are sex-stereotypical and which are non-sex-stereotypical.*

*This would remove the chance of researcher (investigator) bias in choosing pictures that are likely to support the expected result, so the study would have greater internal validity.*

|   |   |
|---|---|
| 1 | 3 |
|---|---|

*Sex-role stereotypes are sets of ideas, shared by members of a society or culture, about the behaviours, traits and activities that are expected of and appropriate for males and for females, for example that girls should be caring and play with dolls while boys should be competitive and play*

football. They act as cognitive short-cuts, so girls behave in ways they understand to be typically female and boys in ways they understand to be typically male. They are acquired through observation, imitation and reinforcement of same-sex models such as parents and the media (social learning theory), and through cognitive development as children's gender schemas form and they reach gender constancy (Kohlberg).

At 7 years old, the children will have reached gender constancy and have well-developed gender schemas, so they will be very aware of different expectations for males and females. Picture 1 fits their schemas, so the likely outcome is that the children will give significantly higher liking ratings to Picture 1 (sex-stereotypical activities) than to Picture 2.

Research supports the transmission of stereotypes. Smith and Lloyd (1978) found that adults offered 'masculine' toys such as a hammer to babies dressed as boys and encouraged them to be active, regardless of the baby's actual sex. Furnham and Farragher (2000) found that men in TV adverts were more often shown in autonomous, professional roles and women in domestic, familial roles. However, much of this evidence is correlational, so it does not prove that stereotypes cause gender behaviour. Sex-role stereotypes may also lack temporal validity, as norms have shifted towards gender-neutral parenting, clothes and toys. Stereotypes can also have negative effects, such as limiting girls' academic and career expectations in science, and biological factors such as prenatal hormones also influence gender, so an interactionist explanation is needed.

|   |   |
|---|---|
| 1 | 4 |
|---|---|

Bem (1974) proposed that androgyny, a balance of masculine and feminine traits, is psychologically healthier than being strongly sex-typed, because androgynous people can adapt their behaviour to different situations. To measure androgyny she developed the Bem Sex Role Inventory (BSRI), which consists of 60 traits: 20 masculine (such as assertive and ambitious), 20 feminine (such as affectionate and gentle) and 20 neutral. Respondents rate themselves on a 7-point scale for each trait, giving separate masculinity and femininity scores. People who score highly on both are classed as androgynous, highly on one as masculine or feminine, and low on both as undifferentiated, a category added later. The traits were chosen by student judges, and the BSRI showed good test-retest reliability.

One limitation is that the BSRI may lack temporal validity. The traits were judged as masculine or feminine by American students in the 1970s, but gender roles have changed greatly since then and many children are now raised to be gender-neutral, so traits like 'ambitious' may no longer be seen as typically masculine. This means the BSRI may not be a valid measure of androgyny today.

A second limitation is that the BSRI is a self-report measure, so respondents may lack insight into their own traits or give socially desirable answers, which reduces validity. It also reduces a complex concept to two numerical scores, which may oversimplify gender identity and ignore factors such as work roles and abilities.

Finally, Bem's claim that androgyny leads to better mental health has been challenged. Adams and Sherer (1985) suggested it is high masculinity, rather than androgyny, that predicts psychological well-being, and androgyny may also include negative traits such as competitiveness.

|   |   |
|---|---|
| 1 | 5 |
|---|---|

*C*

|   |   |
|---|---|
| 1 | 6 |
|---|---|

*A Wilcoxon (signed ranks) test would be more appropriate.*

*Firstly, the same children judged both Picture 1 and Picture 2, so this is a repeated measures (related) design. An unrelated t-test is only appropriate for an independent groups design, where different participants are in each condition.*

*Secondly, the data are ratings of sadness on a scale of 1 to 10, which are the children's subjective opinions. There is no fixed, equal unit of sadness (a rating of 8 is not necessarily twice as much as a rating of 4), so the data are at the ordinal level of measurement rather than interval, and a non-parametric test is needed.*

*The Wilcoxon test is a test of difference for a related design with ordinal data, so it fits both features of the study.*

|   |   |
|---|---|
| 1 | 7 |
|---|---|

*The pictures could be selected by an independent panel of raters (or a different researcher) who do not know the aim or hypothesis of the study, who would decide which picture shows unkind behaviour and which shows kind behaviour.*

*This would remove the chance of researcher (investigator) bias in choosing pictures that are likely to support the expected result, so the study would have greater internal validity.*

|   |   |
|---|---|
| 1 | 8 |
|---|---|

*Selman researched social perspective-taking: the ability to understand the thoughts, feelings and point of view of other people. He presented children with interpersonal dilemmas, such as Holly, who has promised her father not to climb trees but then finds a friend's kitten stuck up a tree. Children*

were asked questions such as how Holly's father would feel if he found out. From their answers Selman identified five levels that show an age-related shift from an egocentric view to a broader social and moral understanding: undifferentiated (egocentric), social-informational role-taking, self-reflective role-taking, mutual (third-party) role-taking and societal role-taking. At 9 years old, most children in the student's study will be at the self-reflective role-taking level, so they will be able to put themselves in the little boy's place and appreciate his point of view. The likely outcome is that they will judge the little boy as significantly sadder in Picture 1 (unkind) than in Picture 2 (kind).

Selman's research is supported by Gurucharri and Selman (1982), a longitudinal study which followed boys over five years and found that almost all progressed through the levels in the predicted order, supporting age-related change. His findings also parallel Piaget's research on declining egocentrism. However, Selman focused on cognitive understanding and neglected the role of empathy and emotion, since a child may understand another person's view without caring about it. He also did not distinguish between perspective-taking with family and with peers, or consider children's complex modern social worlds, such as step-families and online environments, so his levels may be oversimplified. Nevertheless, his research has useful applications, for example in programmes to improve interpersonal negotiation and conflict resolution.

|   |   |
|---|---|
| 1 | 9 |
|---|---|

Vygotsky argued that cognitive development is driven by social interaction and culture. Higher mental functions first appear at the social (interpersonal) level and are then internalised by the child (intrapersonal level). The child is an apprentice who learns the tools of their culture,

especially language, from more knowledgeable others (MKOs) such as parents, teachers or older peers. Language develops from social speech to egocentric speech to inner speech, which becomes thought. The zone of proximal development (ZPD) is the gap between what a child can achieve alone and what they can achieve with help from an MKO. Learning within the ZPD is supported by scaffolding, where the MKO gives help that is gradually withdrawn as the child becomes more competent. He also described stages of concept formation, from vague syncretic to complex to mature concepts.

One strength is research support for scaffolding. Wood, Bruner and Ross (1976) observed a tutor helping 3 to 5 year olds build a wooden block model and identified scaffolding strategies such as recruitment, reduction of degrees of freedom and demonstration, with less help needed as the children grew older. This supports Vygotsky's view that learning is assisted by an expert within the ZPD.

A second strength is its valuable practical application to education.

Vygotsky's ideas led to scaffolding, peer tutoring and collaborative group work in classrooms. Van Keer and Verhaeghe (2005) found that 7 year olds tutored in reading by 10 year olds made more progress than those taught in a normal class, showing that learning from an MKO is effective. His theory also shows parents as active in their child's learning, and improves on Piaget's view by recognising the role of culture, which explains cross-cultural differences in cognitive development.

|   |   |
|---|---|
| 2 | 0 |
|---|---|

Rosenhan (1973) had eight healthy pseudopatients seek admission to 12 US psychiatric hospitals, claiming to hear a voice saying 'empty', 'hollow' and 'thud'. All were admitted, seven diagnosed with schizophrenia, and although they then behaved normally, staff did not detect them; they stayed 7 to 52 days and were discharged with 'schizophrenia in remission'. In a follow-up, staff told to expect pseudopatients (none were sent) judged 41 of 193 genuine patients as fakes. This suggests diagnosis lacked validity. However, the study used DSM-II, so it lacks temporal validity for modern systems such as DSM-5, and it was unethical because staff were deceived.

|   |   |
|---|---|
| 2 | 1 |
|---|---|

The therapist would first help Martine identify the irrational beliefs behind her symptoms, such as her paranoid delusion that her care workers are trying to hurt her. Using the ABC model, the therapist would help her see the link between her thought (they want to hurt me), her emotion (fear) and her behaviour (locking the doors and windows).

Through reality testing, the therapist would challenge the delusion by asking for evidence and offering alternative explanations, for example that it is the care workers' job to help her. The therapist would normalise the voices, explaining they may be her own thoughts rather than real, and teach coping strategies such as distraction, music to drown out the voices and positive self-talk, so she is less preoccupied.

|   |   |
|---|---|
| 2 | 2 |
|---|---|

One biological explanation is genetic. Schizophrenia runs in families: Gottesman (1991) found that the risk is about 1% in the general population, 17% for a dizygotic twin and 48% for a monozygotic twin of someone with schizophrenia. It is polygenic, with Ripke et al. (2014) identifying 108 separate genetic variations associated with increased risk, many linked to

dopamine and glutamate. Genes are thought to create a vulnerability (diathesis) rather than a certainty.

A second biological explanation is the dopamine hypothesis. The original hypothesis proposed hyperdopaminergia in subcortical areas, such as excess dopamine activity in the mesolimbic pathway and D2 receptors in Broca's area, causing positive symptoms such as auditory hallucinations. The revised hypothesis (Davis et al. 1991) added hypodopaminergia in the prefrontal cortex, explaining negative symptoms such as avolition. Other neurotransmitters such as glutamate are also implicated, and neural correlates include enlarged ventricles and reduced activity in the ventral striatum, linked to avolition (Juckel et al. 2006).

In contrast, the family dysfunction explanation proposes that schizophrenia is caused by dysfunctional patterns of family interaction, such as the cold, controlling 'schizophrenogenic mother' (Fromm-Reichmann 1948), double-bind communication where a child receives contradictory messages (Bateson et al. 1956), and high expressed emotion, involving criticism, hostility and emotional over-involvement, which is linked to relapse.

One key difference is the role of the family. Biological explanations implicate the family only passively, through inheriting genes, whereas family dysfunction sees the family as actively responsible through its behaviour, such as poor communication and conflict. This has ethical implications: if family behaviour is seen as the cause, parents may be blamed and stigmatised, while biological explanations make the family less blameworthy, so the biological explanation is less socially sensitive.

Both explanations are deterministic, but in different ways. Biological explanations show biological determinism, as the person's genes and brain chemistry cause the disorder, while family dysfunction shows environmental

determinism. Both are also reductionist, reducing a complex disorder to a single cause, so neither fully explains schizophrenia alone.

Neither explanation can establish causality. Abnormal dopamine levels or brain structure might be an effect of having schizophrenia, or of long-term antipsychotic medication, rather than a cause; similarly, a family might become dysfunctional, critical or highly emotional as a result of coping with a member who has schizophrenia.

The quality of evidence also differs. Biological evidence uses objective, scientific methods such as twin studies and brain scans, although twin studies cannot fully separate genes from a shared environment, as concordance is far below 100%. Evidence for family dysfunction is weaker, as it often relies on retrospective accounts that may be biased. However, Tienari et al. (2004) found that adopted children with a high genetic risk were more likely to develop schizophrenia if their adoptive family was dysfunctional, supporting an interaction of both.

Both explanations have led to effective treatments: antipsychotic drugs such as chlorpromazine reduce dopamine activity, and family therapy reduces expressed emotion and relapse rates. This suggests a diathesis-stress model, combining genetic vulnerability with family stressors, is the most valid explanation.

|   |   |
|---|---|
| 2 | 3 |
|---|---|

Garcia and Koelling (1966) gave rats sweet-tasting water paired with a UCS that made them ill (radiation or lithium chloride). The rats developed a taste aversion (CR) to the sweet water (CS) after a single pairing, even with a delay before sickness. However, when the sweet water was paired with an electric shock, no taste aversion developed.

This suggests biological preparedness: we are innately prepared to link tastes with illness because this aids survival. However, the study used rats, so there are problems extrapolating to humans, although Bernstein (1978) found similar aversions to ice cream in children having chemotherapy.

|   |   |
|---|---|
| 2 | 4 |
|---|---|

Charlene is a restrained eater, eating very few calories. According to restraint theory (Herman and Mack 1975), this has a paradoxical effect: her strict cognitive limit on eating is easily broken, so she disinhibits and overeats, as when she rewards herself with a giant pizza and chips. This cycle of restriction and binge eating leads to weight gain.

Her constant thoughts about food reflect ironic processes (Wegner 1987): trying to suppress thoughts of forbidden foods makes them more salient, increasing temptation. Her very low-calorie diet has unpleasant side-effects, and her unrealistic goal of super-model thinness and past 'yo-yo' dieting suggest she will lose motivation and regain the weight again.

|   |   |
|---|---|
| 2 | 5 |
|---|---|

One biological explanation for anorexia nervosa (AN) is genetic. AN runs in families, and twin studies show it is heritable: Holland et al. (1988) found a concordance rate of 56% for monozygotic twins compared with 5% for dizygotic twins. AN is thought to be polygenic, with candidate genes such as OPRD1 and HTR1D implicated, and genes create a vulnerability rather than directly causing the disorder.

A second biological explanation is neural. Reduced serotonin activity has been linked to AN, shown by lower levels of 5-HIAA (a by-product of serotonin breakdown); disturbed serotonin is associated with anxiety and obsessive thinking. The role of dopamine is more controversial, but Frank et al. (2005) found increased D2 receptor activity in the basal ganglia of recovered AN patients, which may alter how food is experienced as rewarding and increase anxiety. Low levels of leptin, which controls satiety, and dysfunctional neural circuitry in the insula region are also implicated. In contrast, the family systems explanation (Minuchin et al. 1978) argues that AN develops within a dysfunctional 'psychosomatic family' showing enmeshment, where members are over-involved and boundaries are unclear, over-protectiveness, rigidity, and avoidance of conflict. Bruch suggested that controlling parents deny the girl autonomy, so she takes control of the one thing she can: her eating.

One key difference is the role of the family. Biological explanations involve the family only passively, through inherited genes, whereas family systems theory sees the family as actively responsible through its patterns of control and enmeshment. This means the family systems explanation is more socially sensitive, as families may be blamed and stigmatised, whereas a biological cause makes the family less blameworthy.

The family systems explanation may better explain gender differences in AN, which is far more common in females, because teenage girls may be allowed less autonomy than boys in controlling families. It may also better explain the increase in AN over recent decades, since genes cannot change this quickly, whereas the pressures of modern family life may make families more critical or dysfunctional.

Both explanations are deterministic but in different ways: biological

explanations show biological determinism, while family systems theory shows environmental determinism. Both are also reductionist, ignoring other factors such as media influence and personality traits like perfectionism.

Neither explanation can establish causality. Changes in serotonin and dopamine may be an effect of starvation rather than a cause, and a family may become controlling and over-protective as a result of trying to cope with a child who is starving herself. The evidence also differs in quality: biological research uses objective twin studies and scans, although concordance is not 100%, so environment must play a role, while family systems evidence often comes from case studies of families already in therapy, which may not be representative.

The explanations also have different implications for treatment: the biological view suggests drug treatments such as SSRIs, whereas family systems theory suggests family therapy, which has good evidence of effectiveness for adolescents. Overall, a diathesis-stress approach combining both is likely to be most valid.

|   |   |
|---|---|
| 2 | 6 |
|---|---|

Kiecolt-Glaser et al. (1984) took blood samples from 75 medical students one month before their exams (low stress) and during their exams (high stress). Natural killer cell activity was significantly lower in the high-stress sample, and the reduction was greatest in students who reported loneliness and stressful life events.

This was a natural experiment using a real-life stressor, so it has high ecological validity. However, it was correlational, so other variables such as poor sleep during exams may have caused immunosuppression, and the student sample limits generalisability.

|   |   |
|---|---|
| 2 | 7 |
|---|---|

The therapist would focus on Nadine's physiological symptoms. Sensors would be attached to her chest or finger to measure her heart rate and to the muscles at the back of her neck to measure the muscle tension that causes her headaches, with the readings shown on a screen as feedback.

Nadine would learn relaxation techniques, such as deep breathing, to lower her heart rate and muscle tension. When her heart rate fell, she would receive a reward such as a pleasant tone or a happy face on the screen, which acts as positive reinforcement (operant conditioning). Over several sessions she would learn to lower her own stress response, then use the techniques at night when thinking about work.

|   |   |
|---|---|
| 2 | 8 |
|---|---|

Self-report measures ask people to report their own experiences of stress.

The Social Readjustment Rating Scale (SRRS) was developed by Holmes and Rahe (1967). It lists 43 life events, such as death of a spouse and marriage, each given a score in life change units (LCUs) based on ratings by a large sample of judges of how much readjustment the event requires. Death of a spouse scores 100 LCUs and marriage 50. Respondents tick the

events they have experienced in a specified period, such as the past year, and the LCUs are added together to give a total life-change score. A score over 300 LCUs was linked to a high (about 80%) chance of stress-related illness in the following year.

The Hassles and Uplifts Scale (Kanner et al. 1981) measures everyday stressors over the past month. The hassles scale lists 117 negative daily events, such as bad weather, arguments or losing things, each rated as somewhat, moderately or extremely severe, and the uplifts scale lists 135 positive events, such as seeing friends or good news. Hassles were found to correlate more strongly with psychological symptoms such as anxiety and depression than life events, while the effect of uplifts was unclear.

Physiological measures record the body's stress response directly, for example skin conductance (GSR), which measures sweating as an indicator of sympathetic nervous system arousal, heart rate, or the level of cortisol in saliva, blood or urine.

One key difference is objectivity. Self-report measures are subjective, as they depend on how the person perceives and interprets events, and they are open to social desirability bias. Physiological measures such as GSR are objectively observable and cannot easily be faked, so they are more scientific.

A second difference is timing. Self-report measures are usually retrospective, asking people to recall events over the past year or month, so they rely on memory, which may be inaccurate; people may also recall events differently depending on their current mood. Physiological measures can record stress in real time, as it happens.

Self-report measures are therefore mainly used in correlational research, for example correlating LCU scores with illness, so cause and effect cannot be

established. Physiological measures can be used experimentally, for example recording GSR while a participant is exposed to a stressor in a laboratory, which allows causal conclusions. However, self-report measures are more practical and useful for measuring ongoing, long-term stress in large samples, as questionnaires are cheap and quick, whereas physiological measures require specialist equipment and can only record short periods. Despite these differences, both types of measure produce quantitative data that can be statistically analysed and compared, such as total LCUs or cortisol levels.

Both measures also have validity issues. The SRRS treats all events as equally stressful for everyone, ignoring individual differences in interpretation, for example a divorce may be a relief for one person, and it combines positive and negative events. Physiological measures may reflect general arousal of the autonomic nervous system, for example from exercise, excitement or caffeine, rather than stress specifically, and the stress of being measured in a laboratory may itself affect the readings. Researchers therefore often combine both types of measure to improve the validity of their conclusions.

|   |   |
|---|---|
| 2 | 9 |
|---|---|

The limbic system, which includes the amygdala and hypothalamus, plays a key role in aggression. The amygdala evaluates the emotional importance of sensory information and rapidly assesses threats, triggering a fight response. Gospic et al. (2011) used fMRI during a game and found that the amygdala showed heightened activity when participants responded aggressively to unfair offers. Electrical stimulation of the amygdala in animals can increase or decrease aggressive responses.

Serotonin has an inhibitory effect on aggression. Normal levels of serotonin in the prefrontal cortex, especially the orbitofrontal cortex, are linked to greater self-control, as this area moderates impulses from the limbic system. Low serotonin activity reduces this control, leading to disinhibition and impulsive aggression. Virkkunen et al. (1994) found lower levels of 5-HIAA, a by-product of serotonin breakdown, in impulsive violent offenders than in non-impulsive offenders. Testosterone may also increase aggression by influencing activity in the amygdala and orbitofrontal cortex.

|   |   |
|---|---|
| 3 | 0 |
|---|---|

Evolutionary theory states that males compete for females, and a major adaptive problem for males is paternity uncertainty and the risk of cuckoldry, investing resources in another man's child. Bill getting angry when Jane texts male friends is sexual jealousy: he sees them as potential rivals and wants to stop Jane forming a relationship with another man.

Bill's behaviour shows mate retention strategies. Checking Jane's mobile phone is an example of vigilance over her behaviour, and insisting on going out with her is direct guarding. Jane describing Bill as strong and protective suggests he is a dominant male, a trait that would have helped our ancestors protect a partner and offspring.

|   |   |
|---|---|
| 3 | 1 |
|---|---|

One strength is that evolutionary explanations are consistent with research showing sex differences in aggression. Shackelford et al. (2005) found that men who used mate retention strategies, such as guarding and punishing threats of infidelity, were also more likely to use violence against their partners. This supports the idea that male aggression evolved to prevent cuckoldry, and the explanation can also account for other types of aggression, such as bullying to gain dominance.

One limitation is that evolutionary explanations cannot explain cultural differences in aggression. If aggression is an evolved adaptation, it should be expressed in the same way across cultures, yet the !Kung San people of the Kalahari have very low levels of aggression because cultural norms discourage it. This suggests social learning and culture shape aggression more than evolution, and the theory is also hard to test as it is based on speculation about the past.

|   |   |
|---|---|
| 3 | 2 |
|---|---|

Dollard et al. (1939) proposed that frustration always leads to aggression and aggression is always caused by frustration. Frustration occurs when goal-directed behaviour is blocked, creating a psychological drive or tension that is reduced by an aggressive act; this is cathartic. Aggression is often displaced onto a weaker or more available target if the source of frustration is too powerful or unavailable. Frustration is greater when we are close to the goal. Berkowitz (1989) revised the hypothesis, arguing that frustration creates a readiness for aggression, and environmental cues associated with aggression, such as weapons, make aggression more likely.

Berkowitz and LePage (1967) supported the role of cues: students given electric shocks by a confederate gave more shocks in return when a gun was on the table than when a badminton racquet was present, the 'weapon

effect'. This helps explain real-life aggression.

However, the claim that aggression is cathartic has been challenged.

Bushman (2002) found that angry participants who hit a punch bag while thinking about the person who angered them were later more aggressive, not less, suggesting acting aggressively increases rather than reduces aggression.

Frustration also does not always lead to aggression: people may respond with sadness or helplessness, and justified frustration produces less aggression than unjustified frustration. The theory cannot explain cold, calculated, instrumental aggression that occurs without frustration, so learning theory is also needed to explain why aggression becomes a dominant response when it has been rewarded in the past.

|   |   |
|---|---|
| 3 | 3 |
|---|---|

Blackburn (1993) proposed that offending results from an inadequate superego, which fails to control the selfish, pleasure-seeking demands of the id. A weak superego develops if the same-sex parent is absent during the phallic stage, so the child cannot identify with them and internalise moral standards. A deviant superego develops if the child identifies with a criminal parent and internalises deviant values. An over-harsh superego is so punitive that the person feels constant guilt and unconsciously offends to satisfy a need for punishment.

Bowlby's maternal deprivation theory proposed that prolonged separation from the mother in the critical period can cause affectionless psychopathy, a lack of guilt and empathy, which leads to delinquency. In his 44 thieves study, 14 thieves were affectionless psychopaths and most of these (12) had experienced early prolonged separation.

Defence mechanisms also allow offenders to justify crime unconsciously, for example rationalisation, as in 'rich people deserve to be burgled'.

|   |   |
|---|---|
| 3 | 4 |
|---|---|

Using Novaco's model, in the cognitive preparation stage the therapist would help Peter reflect on his past anger and identify the specific triggers, such as hearing people telling stupid jokes in a bar, and recognise his physical signs of anger, such as his racing pulse.

In the skill acquisition stage Peter would learn ways to calm himself, such as deep breathing, counting to ten and positive self-statements like 'I am calm and relaxed'. In the application practice stage he would rehearse these skills in role-plays of provoking bar situations, receiving feedback, so he gets used to controlling himself, and then practise them in real life.

|   |   |
|---|---|
| 3 | 5 |
|---|---|

One strength is research support for its effectiveness. Keen et al. (2000) found that young offenders who took part in an anger management programme showed improved self-awareness and better control of their anger by the end of the course. Because it addresses the irrational thoughts and beliefs that underlie aggression, not just the behaviour, it may produce longer-term change than behaviour modification, and it teaches transferable skills such as self-control that are useful after release.

One limitation is that it requires skilled, trained therapists, so it is expensive and may not be widely available in prisons compared with cheaper token economies. Its effectiveness also depends on the offender's motivation to engage fully, and the role-play practice is artificial, so skills may not transfer to real provocations; some studies show the benefits are short-term and do not reduce reoffending in the long term.

|   |   |
|---|---|
| 3 | 6 |
|---|---|

Neural explanations suggest offending is linked to abnormal brain structure and function. Raine et al. (1997) used PET scans to compare 41 murderers who pleaded not guilty by reason of insanity with 41 controls and found reduced activity in the prefrontal cortex, which regulates emotion and impulse control, and abnormal activity in the limbic system. Raine et al. (2000) found an 11% reduction in prefrontal grey matter in people with antisocial personality disorder. Kiehl et al. (2001) found reduced limbic system activity in psychopathic offenders during emotional processing tasks. Neurotransmitters are also implicated: low serotonin is linked to impulsivity and high noradrenaline to aggression, and the low-activity MAOA gene alters dopamine and serotonin levels.

However, this research is correlational, so cause and effect cannot be established; brain differences might result from offending lifestyles, for

example head injuries or substance abuse, and other variables such as poverty may be responsible. Many studies also link brain abnormalities to antisocial personality disorder rather than to offending itself.

The explanation is reductionist, ignoring social factors such as upbringing and peer influence, which social learning theory emphasises. Raine's own 'social push' hypothesis found that prefrontal dysfunction was stronger in murderers from non-deprived backgrounds, suggesting an interaction of biology and environment.

Finally, it is biologically deterministic, which raises issues for the justice system, as offenders could argue they are not responsible for their crimes.

|   |   |
|---|---|
| 3 | 7 |
|---|---|

Nicotine is absorbed rapidly and reaches the brain within seconds, where it binds to nicotinic acetylcholine receptors in the ventral tegmental area (VTA). This triggers the release of dopamine in the nucleus accumbens, part of the mesolimbic pathway, the brain's reward system, producing pleasurable feelings of euphoria and reduced anxiety. Nicotine also activates natural opioids such as endorphins, and increases serotonin, adding to feelings of pleasure and improved mood.

With repeated smoking, nicotinic receptors become desensitised, so tolerance develops and more nicotine is needed to produce the same effect. According to the nicotine regulation model, during abstinence, such as overnight, receptors become resensitised, causing unpleasant withdrawal symptoms such as irritability and craving, which motivate the person to smoke again to restore nicotine levels, maintaining the addiction.

|   |   |
|---|---|
| 3 | 8 |
|---|---|

Covert sensitisation uses classical conditioning in the imagination. Bertie would first be taught to relax, then the therapist would use vivid guided imagery, asking him to imagine getting comfy on the sofa with chocolate. As he imagines eating it, he would be guided to visualise something noxious, such as feeling sick and vomiting chocolate all over his clothes and sofa, or an overpowering sickly smell of chocolate.

By repeatedly pairing chocolate (CS) with the unpleasant imagined experience (UCS), Bertie develops a conditioned aversion (CR) to chocolate. He would then imagine feeling relief when he turns the chocolate away, which acts as negative reinforcement, so he avoids chocolate in future.

|   |   |
|---|---|
| 3 | 9 |
|---|---|

One strength is that covert sensitisation is more ethical than traditional aversion therapy. Because the unpleasant stimulus is only imagined, the client does not actually experience vomiting or electric shocks, so it is less traumatic and more dignified, and clients can stop the imagery at any time. This means fewer clients drop out, and it can be used flexibly with many substances and behavioural addictions such as gambling. Kraft and Kraft (2005) reported case studies in which it successfully treated a range of addictions.

One limitation is that it relies heavily on the client's ability to imagine vivid, disgusting scenes, so it is less effective for clients who lack imagination or motivation. As a behavioural therapy it only addresses the addictive behaviour and not underlying causes such as stress or depression, so the aversion may fade over time and relapse is likely in the long term.

|   |   |
|---|---|
| 4 | 0 |
|---|---|

Cognitive biases are irrational, distorted ways of thinking that lead gamblers to misunderstand chance outcomes, so they keep gambling despite losses.

Examples include the gambler's fallacy, the belief that a run of losses means a win is due; the illusion of control, believing outcomes can be predicted or controlled through skill or knowledge, such as choosing lottery numbers; ritual bias, believing lucky rituals like blowing on dice influence outcomes; selective recall of wins while forgetting losses; and near-miss bias, where a gambler sees a near-miss as nearly winning, encouraging them to continue.

Griffiths (1994) supported this using a 'thinking aloud' method with fruit machine players: regular gamblers made more irrational verbalisations (14%) than non-regular gamblers (2.5%), and believed they were more skilful than they were, although there were no real differences in skill. Langer (1975)

showed the illusion of control, as participants who chose their own lottery tickets demanded more money to sell them than those given tickets. However, cognitive bias is better at explaining the maintenance of gambling than its initiation, since biases may develop after gambling begins. Not everyone with these biases becomes addicted, so individual differences such as impulsivity and desire for control mediate the effect. Some biases also explain some forms of gambling better than others, for example the gambler's fallacy applies more to roulette and slot machines. Learning theory, including partial reinforcement, may be needed for a full explanation. Nevertheless, the explanation has useful applications, as CBT that challenges biases has been shown to reduce gambling.