

# British Psychology Olympiad Study Guide

2024



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# Chapter 1 - Introduction



Welcome to the British Psychology Olympiad —a unique opportunity for school students passionate about psychology to explore and engage with the diverse and fascinating world of psychological science. This challenge is designed to ignite your curiosity, enhance your critical thinking skills, and broaden your understanding of the field of psychology.

The primary aim of the British Psychology Olympiad is to foster a deeper appreciation for the multifaceted nature of psychology. It will encourage you to think beyond the surface and delve into the core concepts and theories that underpin the study of the human mind and behaviour. Participation in this competition will not only enhance your understanding of psychology but also provide valuable skills that are transferable to various academic and professional pursuits. We encourage you to embrace this opportunity as a chance to deepen your appreciation for the intricate workings of the human mind and behaviour.



# British Psychology Olympiad Content

The British Psychology Olympiad consists of two main sections:

1. **Multiple Choice Section (MCQ):** This section will test your knowledge of fundamental concepts and theories in psychology. It will assess your ability to recall information and concepts spanning a range of approaches.
2. **Essay Section:** The essay section offers an opportunity to showcase your analytical and critical thinking skills. Whether you choose to design an innovative study or unravel the mysteries of consciousness, these thought-provoking questions will test your analytical and creative prowess, inviting you to contribute to the ever-evolving landscape of psychological knowledge.

## This Study Guide

To help participants study, this study guide lists out key terms to review, how to study for the competition, information on research methods and suggested resources.



# Chapter 2 - List of Terms to Review

This list provides some guidance on the key concepts in psychology that will be helpful to focus your preparation around. It is not a complete list of what will come up at the competition, and not all of the topics mentioned will be tested. The concepts we highly recommend you study are indicated in **bold**.



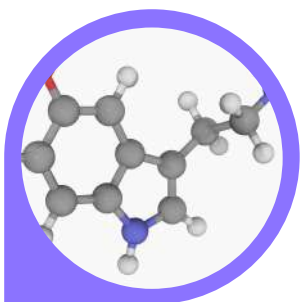
## Cognitive Psychology

- Cognitive Psychology
- **Theories of human attention**
- Short term memory
- Long term memory
- Theories of forgetting
- **Priming**
- **The impact of arousal on cognitive performance**
- Executive function
- **Examples of cognitive biases**



## Social Psychology

- Attitudes and attitude change
- **The implicit association test**
- **Attribution theory**
- Prosocial behaviour
- Theories of obedience
- **Social loafing theory**
- **Social identity theory**
- Attachment theory



## Psychopathology

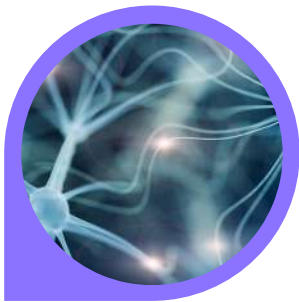
- **Cognitive behavioural therapy**
- Psychodynamic therapies
- **The role of serotonin in depression pathophysiology**
- The role of dopamine in psychosis pathophysiology
- Types of anxiety disorders



## Behavioural Psychology

- Classical conditioning
- Operant conditioning
- **Reinforcement schedules**
- **The dictator game**
- **The ultimatum game**
- **Nudge theory**

## Biological Psychology



- **Neuron**
- **Action potential**
- **Visuospatial neglect**
- **The synaptic cleft**
- **The prefrontal cortex**
- **The parietal lobe**
- **The temporal lobe**
- **The occipital lobe**
- The limbic system
- **Neurotransmitters – serotonin, dopamine**
- Cells of the retina
- **Spectral sensitivity curve**

## Research Methods



- **Independent and dependent variables**
- **Graphical representations: line graph, scattergram, bar graph, histogram, pie chart**
- **Proportions and percentage change**
- **P values and statistical significance**
- **Measures of central tendency**
- Measures of dispersion
- T-tests
- Regression analysis
- **Confidence intervals**
- **Quantitative vs qualitative research**
- Sampling techniques
- **Structured and semi-structured interviews**
- **Monozygotic and dizygotic twin studies**
- **Content analysis**

# Chapter 3 - How to Study Using the List

The questions are designed to test your understanding and application of the concepts and ideas listed above. The list covers a wide range of concepts, and it will not be possible to learn everything about them. Your time will be best spent familiarising yourself with key terminology and reflecting on these concepts, rather than just memorising facts. This chapter will introduce some strategies to study for the challenge using the official syllabus.

When learning about a new theory in psychology, it can be helpful to take the following approach:

- **Definition** – what do the key terms mean in layman’s terms? If statistics are given, can you explain this in words?
- **Research support** – how might we test whether this theory is true? What result might disprove it? Looking at actual research into this concept can enhance your understanding, but it can be equally worthwhile thinking about how you would approach testing this question.
- **Applications** – what does this tell us in terms of human behaviour? How might we use this in the real world? What do we still not know?

Psychology is a rapidly developing field. New research is constantly being published, which means that theories are constantly being developed and refined.

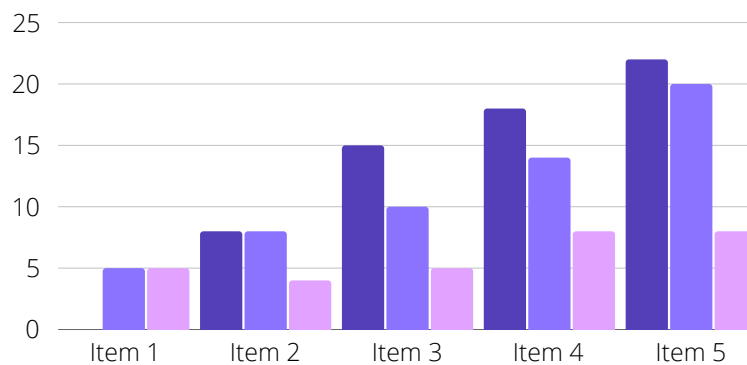
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Many of the theories and concepts listed above were proposed many years ago.

They remain relevant today because of their impact on the subsequent development of the field, or their widespread applications to society. Although it is helpful for your general understanding of the field to stay up to date with new developments, knowledge of the findings of specific academic papers or research studies will not be required unless the papers are provided for you.

# Data Interpretation



In the competition, you will be required to read and interpret the findings of academic papers that will be provided to you. It would therefore be helpful to familiarise yourself with the structure of an academic paper. In the interest of time, it is helpful to practise extracting the key conclusions and implications of a study.

You will also be required to interpret data. The below framework suggests an approach to interpret graphically represented data:

- Note the format of the data: is it a line graph, a bar chart, other?
- Note the x and y axes. What type of data is represented? What is the scale used for each of them?
- Then look at the data points themselves. What do they tell us about the relationship between the variables represented on the x and y axes?

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- Look for any additional features in the graph. Are confidence intervals represented? If so, does this change your interpretation of the information? If a slope is represented, when is it the steepest? Do you see a plateau?
- What do you think about these results? Are they surprising, or do they fit in with an existing theory that you know about?

# Research Methods

The paper also tests your knowledge of research methods in psychology, including statistics. This is a broad area in itself, and can take a long time to fully understand. Focus on understanding research methods in the context of psychological research. What methodology did a particular study use? Why did the experimenters make this choice? Are there any limitations to this methodology?

Similarly, try to think about statistics in the context of interpreting the results of a study. Is a difference or association statistically significant, and what does this tell us? How could you represent this information to make it understandable to others?



# Chapter 4 - Study Resources



We encourage participants to discover and use various channels and resources to learn about psychology. The following can be used as reference resources:

## Cognitive Psychology

- The riddle of experience vs. memory (Kahneman, 2010) - [https://www.ted.com/talks/daniel\\_kahneman\\_the\\_riddle\\_of\\_experience\\_vs\\_memory](https://www.ted.com/talks/daniel_kahneman_the_riddle_of_experience_vs_memory)
- The neurobiological bases of memory formation: from physiological conditions to psychopathology (Bisaz, 2014) - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4246028/>
- Attention in Psychology, Neuroscience, and Machine Learning (Lindsay, 2020) - <https://www.frontiersin.org/articles/10.3389/fncom.2021.698574/full>
- Attention - <https://openpress.usask.ca/introductiontopsychology/chapter/attention/>

## Social Psychology

- Biases in Attribution – <https://opentextbc.ca/socialpsychology/chapter/biases-in-attribution/>
- Why do some ideas prompt other ideas later on without our conscious awareness? - <https://thedeclarationlab.com/biases/priming>

## Psychopathology

- Developing and disseminating effective psychological therapies for anxiety disorders: science, policy and economics - <https://podcasts.ox.ac.uk/developing-and-disseminating-effective-psychological-therapies-anxiety-disorders-science-policy-and>
- What Does Serotonin Do? Neurotransmitter Function - <https://www.simplypsychology.org/what-is-serotonin.html>

## Behavioural Psychology

- Behaviorist Approach To Psychology: Definition, History, Concepts, And Impact (McLeod, 2023) - <https://www.simplypsychology.org/behaviorism.html>
- What The Ultimatum Game Reveals About Human Psychology - <https://www.spring.org.uk/2023/01/ultimatum-game.php>

## Developmental Psychology

- What our language habits reveal (Pinker, 2005) - [https://www.ted.com/talks/steven\\_pinker\\_what\\_our\\_language\\_habits\\_reveal](https://www.ted.com/talks/steven_pinker_what_our_language_habits_reveal)
- The Language Neuroscience podcast - <https://langneurosci.org/podcast/>
- Zhao, T.C., Kuhl, P.K. Effects of enriched auditory experience on infants' speech perception during the first year of life. *Prospects* 46, 235–247 (2016) - <https://link.springer.com/article/10.1007/s11125-017-9397-6>

## Biological Psychology

- UCL Brain stories podcast - <https://www.ucl.ac.uk/research/domains/neuroscience/brain-stories-podcast>
- The Private Life of the Brain – (Greenfield, 2000) Penguin Press Science
- Blindsight and Unconscious Vision: What They Teach Us about the Human Visual System (Ajina and Bridge, 2016) - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5493986/>
- Godlewska BR, Browning M, Norbury R, Cowen PJ, Harmer CJ. Early changes in emotional processing as a marker of clinical response to SSRI treatment in depression. *Transl Psychiatry*. 2016 Nov 22;6(11):e957. doi: 10.1038/tp.2016.130. PMID: 27874847; PMCID: PMC5314109. - <https://pubmed.ncbi.nlm.nih.gov/27874847/>
- Antidepressants, neurobiology and therapeutics by Professor Phil Cowen - <https://podcasts.ox.ac.uk/antidepressants-neurobiology-and-therapeutics>

## Research Methods

- Critically exploring psychology - <https://www.open.edu/openlearn/health-sports-psychology/critically-exploring-psychology/content-section-0?active-tab=description-tab>
- Statistics for psychology - [https://www.youtube.com/watch?v=DWv-4rVY\\_L8](https://www.youtube.com/watch?v=DWv-4rVY_L8)

As noted above, it is also helpful to read academic papers discussing research into any of the above concepts. Some of these require payment to be able to access in full. However, it is worth noting that many papers are available 'open access', without payment. Furthermore, paid-for articles generally allow you to read the opening abstract. This provides a summary of the methodology and key findings of the paper, which can be extremely helpful.



# Chapter 5 - MCQ Sample Questions

In this section, we present a set of sample questions for the MCQ section. By practising these questions, you will gain a deeper understanding of the format of question and how to prepare, whilst also testing your knowledge and sharpening your skills. Answers are marked in bold.

## Sample 1

Executive function is a set of skills that allows us to exert control over our thoughts and behaviour. This includes planning, decision making, flexible thinking and response inhibition. The prefrontal cortex is the key brain structure underlying executive function, It is able to exert top-down control to coordinate functions driven by other brain regions. Individuals with poor executive function can struggle to manage their thoughts, emotions and behaviours.

Which of the following experimental methodologies provides the best measure of executive function?

- 1) Participants must categorise photographic faces as 'Caucasian' or 'African American', and words as 'pleasant' or 'unpleasant' as quickly as possible
- 2) Participants must respond by pressing a button as quickly as possible when they see a 'go' signal, but not respond when they see a 'no-go' signal**
- 3) A long-term memory task in which participants are required to report historical events from their childhood
- 4) The degree of activation of the parietal lobe on functional magnetic resonance imaging (fMRI)



## Sample 2

In a service supporting children and young people with social anxiety disorder, it is noted that there is a great deal of variation in the number of sessions required to reach a stage of clinical improvement. A researcher hypothesises that having a secure attachment with a parent or caregiver enables children to recover more quickly than those who have an insecure attachment style.

Which of the following experimental designs could be used to assess this claim?

**1) A between-participants design comparing the number of required sessions for children classed as securely versus insecurely attached**

2) A randomised controlled trial, in which children are allocated to either a short (5 sessions) or long (20 sessions) course of treatment. Relationship with the primary caregiver (secure or insecure attachment) is measured as the primary outcome measure

3) A between-participants study comparing ratings of quality of relationship with their primary caregiver in those who have just completed treatment for social anxiety disorder compared to those who are just about to begin treatment

4) A longitudinal design assessing how positive a child's relationship with their primary caregiver is, and correlating this measure with their subjective social anxiety levels

5) A conversation analysis exploring the parenting advice given by caregivers with a securely attached child



### Sample 3

Researchers hope to train a mouse to anticipate food following repeated exposure to a blue light. To do this, they study the Rescorla Wagner model of associative learning.

The following equation represents the Rescorla Wagner model:

$$\Delta V = \alpha\beta(\lambda - \Sigma V)$$

Where:

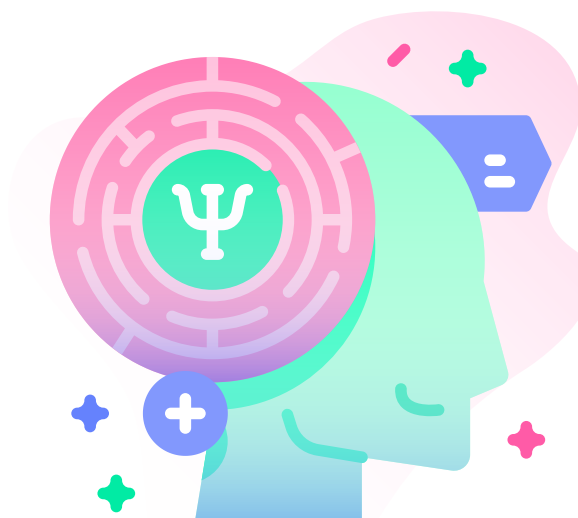
$\Delta V$  is the change in associative strength, or amount of learning, that occurs during each trial. In this case, it is the learned association between the blue light and the food.

$\lambda - \Sigma V$  refers to the difference between the actual unconditioned stimulus (amount of food received) and the expected unconditioned stimulus (amount of food expected)

$\alpha$  and  $\beta$  are constants related to the salience of the conditioned stimulus (blue light) and unconditioned stimulus (food)

Using the Rescorla Wagner model as a means of predicting associative strength, which of the following methods should be used to facilitate the strongest possible learning between the blue light and food administration?

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1) **The researchers should first train the mouse to associate a red light with the absence of food, by withholding food pellets for five minutes following the presentation of a red light. Once this learning is established, researchers should display a blue light, followed ten seconds later by the administration of a food pellet. The difference between actual and expected outcomes should drive stronger learning between the blue light and the food.**

2) The researchers should first train the mouse to associate a red light with food, by consistently dispensing one food pellet ten seconds after the red light is displayed. Once this learning is established, researchers should begin to display a blue light at the same time that the red light is displayed, before one food pellet is dispensed. The associative learning between the red light and food can be transferred to the blue light.

3) In order to avoid overstimulating the mouse, researchers should ensure the light intensity is the lowest that is still comfortably visible, and to avoid any accompanying sounds.

4) The researchers should first train the mouse to associate a red light with food, by consistently dispensing one food pellet ten seconds after the red light is displayed. Once this learning is established, researchers should abruptly stop providing food after exposure to the light. This increases the prediction error, or difference between anticipated and actual outcomes, subsequently strengthening learning.

5) In order to ensure the mouse continues to pay attention to the blue light, it should be paired with the food on only 20% of trials. The mouse should be exposed to the blue light, 10 seconds after which food will either be administered (20% of trials) or it will not be administered (80%).





## Sample 4

A university student wants to determine which part of the brain is the most important for learning new languages.

Participants are given a task in which they are asked to memorise a series of made-up words ('learning condition'). After that, they are asked to simply relax, and think about whatever they like ('rest condition'). Using functional magnetic resonance imaging (fMRI), the student compared patterns of brain activation shown in each participant in the learning versus the rest conditions. The student identified a hotspot of activity in the frontal lobe that was present during learning but not during rest. They deduced that this must be the 'learning centre', responsible for the acquisition of new languages.

Which of the following, if true, limits the validity of the student's conclusion?

- 1) The control condition is inadequate, as participants may be engaging in linguistic activities when not explicitly instructed to
- 2) It is overly simplistic, as language learning is more complex than simply memorising words
- 3) The made-up words may not be structurally similar to real words
- 4) It does not consider whether participants were successfully memorising the words
- 5) All of the above**



## Sample 5

An 18-year-old man suffers a traumatic brain injury whilst on a skiing holiday. His family reports he is behaving very differently, making rude and inappropriate comments that he would not have said prior to the injury. He has taken up gambling, which is also out of character for him, and has been losing large amounts of money in this way despite his family's protestations.

Which of the following brain regions is most likely implicated in this patient's presentation?

- 1) Posterior superior temporal gyrus
- 2) Prefrontal cortex**
- 3) Central sulcus
- 4) Left parietal cortex
- 5) Occipitotemporal sulcus



# Good Luck!



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