



Themantic Education's

IB Psychology

A Revision Guide

PREVIEW

Travis Dixon

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How to Use This Book

This revision book accompanies our textbook, *IB Psychology: A Student's Guide*. It covers everything needed for the IB Psychology exam, including the Abnormal Psychology and Human Relationships options. Whereas the textbook is designed to be used on a daily basis and is written in a conversational and explanatory tone, this revision book includes only the essential details and facts needed to ace the exam. With this in mind, here are some tips on how to use this book:

1) Support and Supplement

I recommend using this as a supporting text to read and revise after you have already had an attempt at learning this material in your daily lessons and with the help of the textbook and your teacher. Even though the content has been reduced to exactly what you need for the IB exams, there is still a lot of content. Therefore, it is important you are taking the time in your course and with your teacher's help to understand the content.

2) Feel Free to Deviate

For nearly every topic in the IB Psychology course, the student's guide textbook, *IB Psychology: A Student's Guide*, offers multiple ways for you to answer each question. For example, there are three or four possible examples of localization of brain function that are covered in the textbook. For multiple reasons, I have included only one of those in this revision book. That is not to say that you can't use an example not included in this book. In fact, it can be to your advantage to design some of your own revision resources for other ways of addressing the exam questions because this will help your answer stand out from the rest. It would be difficult, if not impossible, for you to create all of your own revision materials in the detail provided in this book, so remember to pick your battles.

3) Revise Regularly

Learning is the result of regular revision, so I would recommend having this book from the beginning of the course and using it to re-read and revise topics that you are covering in your regular classes. If you wait until right before the exams to try to cram all of this information into your brain, you probably won't succeed.

4) Play to Your Strengths

If you're using our student's guide textbook, there are many ways to address some topics, especially those in the biological approach, as has been mentioned already. Therefore, it can be a good idea to try to learn as much as possible throughout the course (of course), but wait until you've covered all units in your course before figuring out which examples you want to use for each topic. This will also help you identify the overlaps between Paper One and Paper Two that you want to exploit.

A Note on the Text

This revision book relies primarily on the studies and concepts used in our textbook, *IB Psychology: A Student's Guide*. I was hesitant to add any new studies to this revision textbook. However, a few new studies have been added because of the changes to the IB Psychology curriculum that were made after the publication of our original textbook. All new studies have been chosen for their relevance and their simplicity, so this will not add extensively to your revision. You will be able to achieve top marks without learning any new studies, but they are included to give you more options and flexibility when preparing to write exam answers.

Good luck!

General Revision Tips

Paper One – Section A

- All possible topics in the core could be asked as a short answer question and you have to answer all SAQs. Therefore, prepare one central argument and one supporting study for every *topic* from all three *approaches*.

Paper One – Section B

- You only have to write one essay and you will have a choice on which approach you write your essay about (biological, cognitive or sociocultural). Therefore, choose one approach that you want to specialize in and prepare to write an essay for this approach in Section B (see the 3-2-1 approach below).

Paper Two

- There are three topics per option and one question will be from each topic in Paper Two. Therefore, you can adopt a 3-2-1 approach for the options as well (see below).
- For example, you might become an expert in explanations of disorders, followed by treatments and you can largely ignore the issues in diagnosis.

3-2-1 Approach

- Whenever you have choice in the exam questions you answer, you can adopt a 3-2-1 approach: become an expert in one topic choice, have a second one as a backup, and ignore the third.
- For example, you might prepare to write essays about any topic in the biological approach for Paper 1, have the cognitive approach as a backup, and largely ignore the sociocultural approach.

Paper Three

- Don't revise any more than is necessary – look at how many points are required for each question and be sure to prepare accordingly.
- For example, you get three marks for describing the research method used, which means you have to state the method (1 mark) and two characteristics of that method (2 marks). You do not need to evaluate the method, so revising this would be a waste of time for Paper 3.

Find Overlaps

- The same arguments and studies can be used in topics throughout the core and options. Therefore, study smarter and not harder by trying to find these overlaps. For example, you could revise the use of SSRIs as a treatment for PTSD as well as an example of how neurotransmission can affect behaviour.

3 Steps to Learn Anything

1. Find out what you need to know (use the key questions and the syllabus outlines to guide you).
2. Find your knowledge gaps (what you don't know).
3. Fill your knowledge gaps!

EXAM OVERVIEWS

Assessment	Time	Weighting	
		SL	HL
Internal Assessment (IA)	20hrs	25%	20%
Paper One	2hrs	50%	40%
Paper Two	1hr (SL) 2hrs (HL)	25%	20%
Paper Three (HL Only)	1hr	-	20%

Paper	Contents
<p>Paper One</p> <p>Core Approaches</p>	<p>Section A – Short Answer Responses (Total = 27 marks)</p> <ul style="list-style-type: none"> • Three short answer questions (9 marks each) • One from each approach (Biological, Cognitive, Sociocultural) • Answer <i>all</i> three questions <p>Section B – Essay (Total = 22 marks)</p> <ul style="list-style-type: none"> • Three essay questions • One from each approach (Biological, Cognitive, Sociocultural) • Answer <i>one</i> question • <i>HL: at least one question from the extension topics</i>
<p>Paper Two</p> <p>Options</p>	<ul style="list-style-type: none"> • 12 essay questions in total • Three from each option • One from each topic within each option <p>Standard Level (Total = 22 marks)</p> <ul style="list-style-type: none"> • Write an essay response to <i>one</i> question from <i>one</i> option <p>Higher Level (Total = 44 marks)</p> <ul style="list-style-type: none"> • Write <i>two</i> essay responses • One from two different options <ul style="list-style-type: none"> ◦ E.g. One from the abnormal option and one from human relationships option.
<p>Paper Three (HL ONLY)</p> <p>Research Methodology</p>	<p>Question 1</p> <ul style="list-style-type: none"> • Three questions (3 marks each, 9 marks total) • Answer all three questions <p>Question 2</p> <ul style="list-style-type: none"> • One question about ethical considerations (6 marks) <p>Question 3</p> <ul style="list-style-type: none"> • One question (9 marks) <p>Total = 24 marks</p>

2 Biological Approach

Biological Approach to Understanding Human Behaviour

Topic	Content
The brain and behaviour	<ul style="list-style-type: none">• Techniques to study the brain in relation to behaviour• Localization• Neuroplasticity<ul style="list-style-type: none">• <i>Neural networks</i>• <i>Neural pruning</i>• Neurotransmitters and their effect on behaviour<ul style="list-style-type: none">• <i>Synapse (excitatory and inhibitory)</i>• <i>Agonists and antagonist</i>• <i>Neurons</i>
Hormones and pheromones and behaviour	<ul style="list-style-type: none">• Hormones• Pheromones
Genetics and behaviour	<ul style="list-style-type: none">• Genes and behaviour• Genetic similarities<ul style="list-style-type: none">• <i>Twin and kinship studies</i>• Evolutionary explanations for behaviour
Ethical considerations and research methods	<ul style="list-style-type: none">• Students need to understand the use of research methods and relevant ethical considerations for each <u>topic</u>.

Terms in italics may be used in short-answer questions from May 2020 onwards.

Biological Approach to Understanding Human Behaviour

	Content	Key Questions	Key Studies
The brain and behaviour	Techniques used to study the brain in relation to behaviour	<i>How and why are one or more technological techniques used to study the brain in relation to human behaviour?</i>	<ul style="list-style-type: none"> • Passamonti et al., 2012 • Radke et al., 2015 • Plus others...
	Localization	<i>How have one or more examples of localization of brain function been determined?</i>	<ul style="list-style-type: none"> • Feinstein et al., 2011 • Ahs et al., 2009
	Neuroplasticity	<i>How can one or more examples of neuroplasticity be demonstrated in research?</i>	<ul style="list-style-type: none"> • Luby et al., 2013 • Sapolsky et al., 1990
	Neurotransmitters and their effect on behaviour	<i>How can one or more neurotransmitters affect human behaviour?</i>	<ul style="list-style-type: none"> • Moore et al., 2002 • Passamonti et al., 2012 • Pucilowski et al., 1985
Hormones & pheromones	Hormones and behaviour	<i>How can one or more hormones affect human behaviour?</i>	<ul style="list-style-type: none"> • Radke et al., 2015 • Albert et al., 1986 • Buchanan and Lovallo & Sapolsky (cortisol)
	Pheromones and behaviour	<i>How might pheromones affect human behaviour?</i>	<ul style="list-style-type: none"> • Cornwell et al., 2004 • Saxton et al., 2008
Genetics & behaviour	Genes and behaviour	<i>How can genes affect human behaviour?</i>	<ul style="list-style-type: none"> • Meyer-Lindenberg, 2008 • Caspi et al., 2002
	Genetic similarities	<i>How are genetic similarities in twin and kinship studies used to study genes and human behaviour?</i>	<ul style="list-style-type: none"> • Baker et al., 2007 • Grove et al., 1990
	Evolutionary explanations for behaviour	<i>How can evolution explain one or more human behaviours?</i>	<ul style="list-style-type: none"> • Feinstein et al., 2012 • Ahs et al., 2009

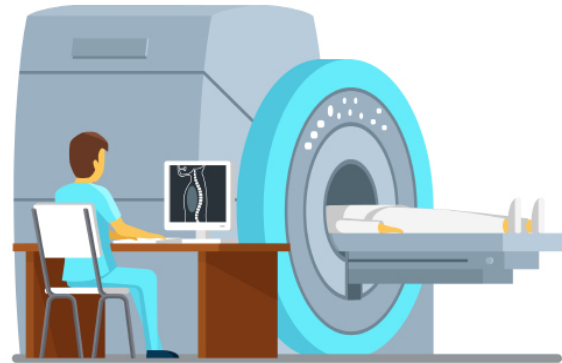
All answers should be supported by evidence. Essay responses in Paper 1, Part B should include critical evaluation of the answer and the evidence. Students should also be prepared to discuss research methods and ethical considerations related to the relevant studies for the above topics.

Techniques to Study the Brain

Functional magnetic resonance imaging (fMRI)

How and why are technological techniques used to study the brain?

fMRIs are used in experimental research to see how chemical messengers can influence brain activity. This can provide deeper understanding of how those messengers can affect behaviour.



Key Details

- **Functional magnetic resonance imaging (fMRI)** machines measure the *activity (or function)* of areas of the brain when the participant is performing a task or cognitive process.
- They are often used in experimental research where the level of a chemical messenger is the IV (e.g. serotonin or testosterone levels).
- Participants receive a treatment (e.g. injection with a treatment or placebo) and then lay in the fMRI. They are then asked to perform a task (like viewing different types of faces). The task they perform is related to the behaviour being studied. For instance, viewing different types of emotional faces is designed to represent experiencing a social threat. Their brain activity is then measured while they are performing this task. By doing this, the researchers can see how chemical messengers can affect activity in certain parts of the brain during certain tasks, like perceiving a social threat.
- These studies provide greater insight into how chemical messengers like neurotransmitters (e.g. serotonin) and hormones (e.g. testosterone) may influence behaviour because of their influence on brain function (e.g. in areas such as the amygdala and prefrontal cortex).
- The use of fMRIs in this way could help to develop an understanding of origins of behaviours such as violence and symptoms of PTSD by showing us how chemical messengers associated with particular behaviours can also impact brain activity.

Key Studies

All of these studies investigate the effects of biological variables on brain activity (e.g. the PFC).

Serotonin's effects on the PFC and amygdala during social threat (Passamonti et al., 2012): The fMRI results in this study showed depleted serotonin reduced PFC activity when participants were viewing angry faces (i.e. facing a threat) and disrupted communication between the amygdala and the PFC. *(See page 18)*

Testosterone's effects on the amygdala (Radke et al., 2015): The results of this study showed that injecting testosterone increases activity in the amygdala when motivated to approach a threatening face. *(See page 20)*

SSRIs and PFC function (MacNamara et al., 2016): The fMRIs used in this study showed how SSRIs can improve PFC function when perceiving emotional stimuli (e.g. faces showing different emotions). *(See page 136)*

Exam Tips

- The guide says you can study "one or more technological techniques." It is advisable to focus on *technological techniques* as opposed to others (e.g. experimental methods, animal studies, post-mortem studies, etc.)
- Top marks will be given to answers that can explain *how* and *why* the technique is used, as well as showing this in example studies.
- To cut down on studies you have to remember, a good revision strategy is to prepare to use the same studies for techniques, research methods and ethical considerations.

Extension: Localization

- Localization of brain function studies: fMRIs can also be used to study localization of brain function. In these studies, participants are put in an fMRI and they are asked to perform certain cognitive tasks (or other types of tasks) while the machine measures their brain activity. From this, psychologists can see which parts of the brain are used when doing certain tasks, so they can conclude that the activated areas of the brain must have some function in the behaviours being performed.
- An example of this can be seen on studies involving **cognitive reappraisal** – the process of reinterpreting or reassessing an emotional stimulus to change the

emotional impact it might have. An example of this would be thinking about something as being harmless so as to reduce the fear response. Studies like this have shown that the vmPFC is vital in this process and can also downregulate activity in the amygdala, which may explain how it reduces the stress response.

- Other examples include flashing emotional stimuli on the screen and seeing which part of the brain is activated. Studies like this have shown the function of the amygdala in unconscious perception of emotional stimuli.

Further Studies

Urry et al., 2012: In this study, 19 healthy participants were exposed to a range of emotional stimuli that were flashed on a screen while they were in an fMRI machine. They were asked to cognitively reappraise the stimuli by either increasing, decreasing or attending - they could “increase” by imagining the scene happening to someone they loved, “decrease” by imagining it wasn’t real or “attend” by simply focusing on the details of the image. The results showed a negative correlation between vmPFC and amygdala activation – the higher the vmPFC activity, the lower the amygdala activation. This could explain the common finding of hypofunction and reduced volume in the vmPFC in patients with PTSD.

Ahs et al., 2009: The amygdala in the perception of fearful stimuli by Ahs et al. (2009): Female participants who identified as having a fear of snakes or spiders were placed in a brain imaging machine (PET) and were exposed to various images – some of snakes or spiders, others of neutral stimuli. The activation in their amygdala was higher when they were perceiving images of the stimuli they were afraid of (i.e. snakes or spiders) than when perceiving neutral images. This study shows the use of positron emission tomography (PET) which, like fMRI, measures brain activity during cognitive tasks. Participants are injected with a mild-dose of radiation and the areas of the brain that are active during a task light up on the screen. Ahs et al.’s use of PET can help us learn about how the amygdala is involved in emotion and perceiving threat.

Critical Thinking Considerations

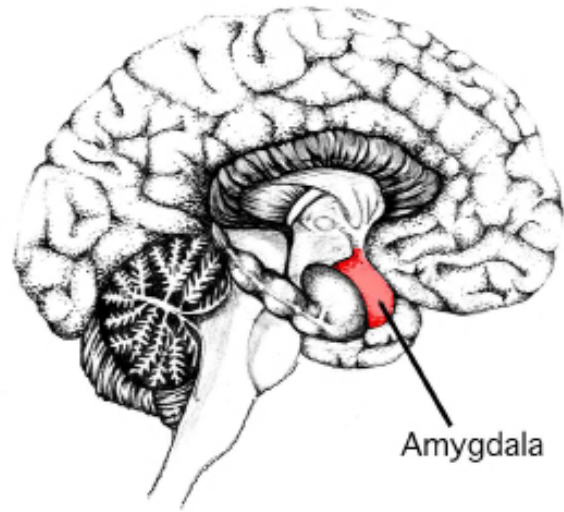
- Participants have to lie completely still in an fMRI. How could this factor affect the generalizability of fMRI studies?
- Are results from fMRI studies inherently inhibited by a lack of validity? (You might want to consider mundane realism, ecological validity or construct validity)
- What are some other limitations of using fMRI? For example, what does an MRI tell us that an fMRI cannot?
- Are there ethical issues to consider with the use of fMRI?
- Technology is always evolving. How could brain imaging technology evolve in the future to increase its validity in the study of behaviour?

Localization of Brain Function

The amygdala and the stress response

How have one or more examples of localization of brain function been determined?

Particular parts of the brain are responsible for performing certain functions. This is a concept known as localization of brain function. One example is the function of the amygdala, which is to perceive threats and activate the stress response so we can experience fear. We know this from animal studies, fMRI studies and case studies.



Key Details

- **Localization of brain function** means particular parts of the brain perform particular functions.
- The **amygdala** is a small almond-shaped part of the brain and is part of the limbic system, which is located within the temporal lobe (there is one amygdala on each side of the brain).
- The amygdala is called the emotional center of the brain because of its role in emotion and the stress response.
- One key function of the amygdala is that it perceives things that are threatening or dangerous and it activates

our stress response. It does this by activating the HPA-axis, which results in the release of stress hormones (like cortisol and adrenaline) that help us experience the sensation of fear and trigger a fight or flight response.

Key Study

A case study of SM and the amygdala's function in fear (Feinstein et al. 2012): The aim of this study was to see if the amygdala plays a role in the experience of fear. SM is a patient with bilateral amygdala damage due to a genetic condition. This study followed prior studies that showed she had impairment in other fear-related behaviours, like fear conditioning and the ability to recognize fear in other people. The researchers tried to induce fear by taking her to a pet store (with snakes, spiders etc), a haunted house and showed her scary film clips to see if she would be afraid. They also gathered data on her life by using self-report questionnaires and interviews. The results of the study showed that none of these experiences caused her to feel afraid. For

example, when she was in the pet store she wanted to touch and play with the large, dangerous snakes. When she was in the haunted house she was excited and did not show fear and in fact, she even accidentally scared one of the "monsters." SM's lack of emotional response to stimuli means she won't release cortisol to facilitate memory of emotional (e.g. fearful) situations. This could explain why she has repeatedly found herself in danger, including being in an abusive relationship for many years and being held at knifepoint - her lack of a fear response means she does not learn to avoid dangerous situations. From SM's case study, we can conclude that the amygdala is a key part of the brain that is responsible for our ability to experience fear.

Exam Tips

- SM is good for a SAQ. Add Ahs et al. for an essay.
- The examples in this topic could also be applied to evolutionary explanations of fear, as well as the use of technological techniques to study the brain.
- A common error is to describe a relevant study but not to clearly explain *how* it demonstrates the particular function of a part of the brain.
- Another good example that could be used for this topic is the vmPFC and its role in decision-making (Bechara et al.) and cognitive reappraisal (Urry et al.)

Extension: Evolutionary Explanation

- The function of the amygdala in perceiving threats, activating the stress response and inducing the emotion of fear is an evolutionary adaptation. This is because the amygdala's function of immediately and automatically activating the stress response in response to threat, including the release of stress hormones like adrenalin and cortisol, allows us to have the quick burst of alertness and energy we may need to escape from or confront our source of danger.
- Another interesting finding of the amygdala is that it can perceive threatening stimuli before we are consciously aware that we have seen it. This can be tested using an fMRI where images are flashed so quickly that the participant cannot consciously recall seeing any image, but the amygdala's activity increases as the image is presented.

Further Studies

The amygdala in the perception of fearful stimuli by Ahs et al. (2009): Female participants who identified as having a fear of snakes or spiders were placed in a brain imaging machine (PET) and were exposed to various images – some of snakes or spiders, others of neutral stimuli. The activation in their amygdala was higher when they were perceiving images of the stimuli they were afraid of (i.e. snakes or spiders) than when perceiving neutral images. This study provides evidence

for the evolutionary explanation of the function of the amygdala in perceiving threats and activating the stress response because we can see that the activation was higher in things that the participants were afraid of (snakes or spiders). In a real-life encounter, the activation of the amygdala would activate the HPA axis (a.k.a. the stress response) and the women would get the burst of stress hormones that would prepare them to deal with the threat.

Critical Thinking Considerations

- The amygdala is not working by itself in the experience of fear – it relies on the interaction of complex neural networks. What other areas of the brain are responsible for experiencing fear? Hint: think about what happens *before* and *after* the amygdala perceives the threatening stimuli.
- How much we experience fear in response to danger is not just affected by the activity in the amygdala. How can our thoughts and/or other parts of the brain influence the stress response? (For help, read about cognitive reappraisal and the vmPFC in the Abnormal Psychology review materials, including Urry et al.'s study).
- Is everyone's amygdalae the same? Do you know of any factors that might affect the function of the amygdala in the fear response? It might be helpful to read Luby et al.'s study on stress and the brain below.
- Both studies above can explain how fear may be induced by the perception of external stimuli. Are they limited in demonstrating the role of the amygdala in experiencing other types of fear?
- What factors may influence the generalizability of the above studies? For example, are they limited in their population validity?
- What are the ethical issues related to SM's and Ahs et al.'s studies?

Research Method #1

True experiments

How and why are true experiments used in the biological approach?

True experiments (a.k.a. laboratory experiments) are used when the researchers manipulate an independent variable and create different conditions. Then, as much as possible, they control for all extraneous variables and measure the effects of the independent variable (IV) on the dependent variable (DV). By carefully controlling the extraneous variables, the researchers can maximize the chances that any differences in the DV can be explained by the IV. This allows for conclusions about causality to be made.



Key Details

- **True experiments in the biological approach to understanding behaviour:** In this approach, the focus is on the study of relationships between biological variables and behaviour. For this reason, many **true experiments** investigate how biological variables can influence behaviour. In order to do this, experiments are used by having a biological variable as the **independent variable** and the behaviour as the **dependent variable**. In some cases, the dependent variable is activity in the brain, which can be used to

explain links between biological factors and behaviour. Many of these studies also use brain imaging technology (like fMRIs), with the dependent variable being brain activity.

Key Studies

The brain and behaviour: In these studies, biological factors such as chemical messengers (including neurotransmitters like serotonin and hormones such as testosterone) are manipulated in laboratory settings and their effects on the brain are measured using fMRI. In these studies, brain activity is the DV. This is helpful when animal experiments have shown causal relationships between biology and behaviour and human subjects are used to understand how brain function might explain this relationship (e.g. testosterone and aggression).

Radke et al., 2015; Passamonti et al., 2012

Hormones and pheromones and behaviour: See above explanation. In addition, animal studies allow researchers to manipulate hormones and directly measure their effects on behaviours that could not be studied (ethically) on humans. A good example of this is aggression.

Radke et al., 2015; Albert et al., 1986

Genes and behaviour: See the animal extensions for more information about how genes can be manipulated in laboratories using genetic knockout techniques. SL students are encouraged to write correlational studies for genes and behaviour (e.g. twin and kinship studies).

Critical Thinking Considerations

- Are true experiments inherently limited in generalizability because of their artificial environments?
- How can correlational studies inform true experiments? Hint: where might a researcher get the idea to manipulate serotonin to measure aggression?
- What are the ethical considerations associated with true experiments?

Ethical Consideration #1

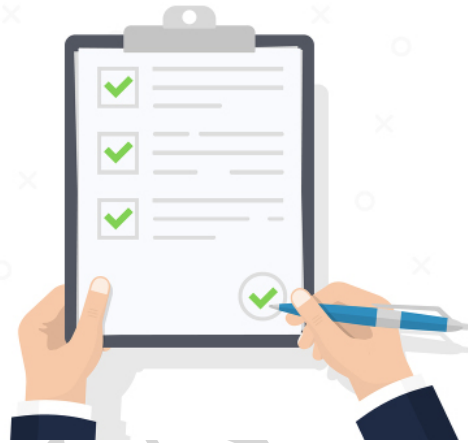
Informed consent in true experiments

How and why are ethical guidelines considered in the biological approach?

At the heart of **ethics** in psychological research is considering the impact the research might have on others, especially the participants. Informed consent is one consideration that can reduce some of the stress and other negative effects of participating in a study. **Informed consent** means you get an agreement from participants that they want to be in the study (consent) and that they are basing this decision on information you have given them (informed).

Key Details

- In true experiments in the biological approach, **informed consent** is an important consideration because researchers must carefully consider how much information to reveal to participants and when. In true experiments that investigate the biological effects on behaviour, biological factors are often manipulated in some way so the researchers can compare conditions. In order to do this, researchers alter the physiology of



participants. If participants are not informed of the possible effects they may experience, this could cause stress and emotional harm. Therefore, in order to ensure a study is ethical, informed consent must first be obtained.

Key Studies

The brain and behaviour: In studies where levels of chemical messengers are manipulated and their effects on the brain are measured, informed consent is an important consideration because researchers often use a blind design and placebos for control conditions. This helps researchers to isolate the biological change (e.g. serotonin or testosterone levels) as the only variable affecting the dependent variable. However, ingesting a substance that alters physiology in a way that is hypothesized to affect the brain is something that participants might find unpleasant. Therefore, researchers need to consider how much information to include in their informed consent forms so as to have a balance between looking after the psychological well-being of participants whilst not jeopardizing the validity of the study through expectancy effects.

Radke et al., 2015; Passamonti et al., 2012

Hormones and pheromones and behaviour: *See above explanation.* In addition, animal studies on the effects of hormones on behaviour also have their own sets of ethical considerations – see the HL extension material for more information about this.

Radke et al., 2015; Albert et al., 1986

Genes and behaviour: Studies on genetics often focus on sensitive topics like antisocial behaviour. When studying such behaviours (e.g. child abuse and violence), researchers need to consider how this might impact their participants. Since genetics is something that we cannot control, it is especially sensitive. For studies on the MAOA gene, participants need to undergo genetic testing to identify if they have the MAOA-L gene variation or not. Since this is correlated with antisocial behaviour, it might have a negative psychological effect to learn you have this particular type of gene. Researchers need to consider this when constructing their informed consent forms.

Caspi et al., 2002; Meyer-Lindenberg, 2008

Critical Thinking Considerations

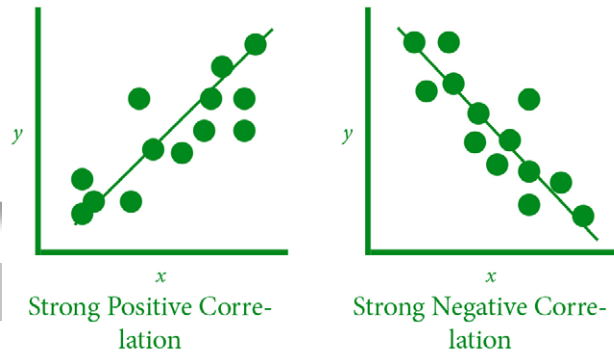
- How might informed consent affect the validity of a study?
- Should researchers reveal everything in their informed consent forms?
- Are there other ethical considerations relevant to true experiments at the biological approach?

Research Method #2

Correlational studies

How and why are correlational studies used in the biological approach?

Correlational studies measure how strongly two (or more) variables are related. Unlike experimental methods that include a direction of causality (IV→DV), correlational studies have co-variables.



Key Details

- **Correlational studies in the biological approach to understanding behaviour:** In this approach, correlational studies are used to assess the strength of relationships between biological factors and behaviour. Researchers gather data by first measuring the behaviour in some way. For example, questionnaires, surveys and interviews can be used to measure levels of aggression and/or antisocial behaviour. The co-variables also have to be calculated, and they include things like genetics,

hormone and neurotransmitter levels. How strongly the behaviour is correlated with a biological factor is then calculated. The correlation co-efficient gives us a value of how strongly the variables are correlated, with 1.0 being a perfect positive correlation and -1.0 a perfect negative correlation (0.0 is no correlation). A 0.4 (or -0.4) correlation is considered moderate and anything around 0.7 or higher is considered strong.

Key Studies

The brain and behaviour: Neurological factors like serotonin have been correlated with behaviours like antisocial behaviour. Correlational studies are also used to see how environmental variables are correlated with brain volume and activity. This is commonly the case in studies that look at how environmental factors can affect the brain (e.g. studies on neuroplasticity). For example, neglect, stress, poverty, and parenting are all factors that have been correlated with brain development.

Luby et al., 2013; Passamonti et al., 2012

Hormones and pheromones and behaviour: Hormones like testosterone have been correlated with behaviours like antisocial behaviour and aggression.

Ehrenkrantz et al. 1974

Genes and behaviour: The IB considers twin and adoption studies as being correlational. This may be because they measure heritability, which is a measure of how strongly genes are correlated with behaviours. Read more in the topic “Genetic similarities” for how and why correlations in twin and kinship studies are used to understand connections between genes and behaviour.

Baker et al., 2007; Grove et al., 1990; Caspi et al. (2002);

Critical Thinking Considerations

- Correlation does not mean causation. This is the fundamental limitation of correlational studies. One way of making this point is by explaining examples of how other variables might affect the two being correlated in a study. Can you think of examples of this for any of the above?
- Another way of critiquing correlational studies is by showing how bidirectional ambiguity may be an issue in the study. Is it variable A affecting B or vice-versa? Can you explain any examples of bidirectional ambiguity in the above studies?

Exam Tips

- It is important to note that you might be asked about research methods used at the biological approach in general or in relation to one or more of the three specific topics.
- Preparing to use correlational studies to critique the use of true experiments (and vice-versa) is an effective strategy if you're planning on writing an essay for the biological approach. This will enable you to have an effective evaluation or discussion, use a range of studies and show depth of understanding.

Ethical Consideration #2

Anonymity in Correlational Studies

How and why are ethical guidelines considered in the biological approach?

Anonymity in psychological studies means that the names of participants are not revealed when recording and/or publishing results of studies. This is an especially important consideration when the topics being studied are sensitive.



Key Details

- In studies at the biological approach, the behaviours being investigated are often highly sensitive, including antisocial behaviour, aggression, violence, neglect, stress, etc. For this reason, anonymity is important because participants probably would not want others to know about their results in these studies. Informed consent forms should promise anonymity and, if there are exceptions, it should be made clear to the participants before they consent to join the study.

Key Studies

The brain and behaviour: Because we know the importance of brain activity and volume in connection with behaviour, this is an incredibly sensitive topic. Therefore, anonymity is an essential consideration in any study that measures participants' brain activity and/or volume. Similarly, studies that correlate stress, parenting-styles and socioeconomic status also require anonymity, as people may not want others to know these personal details.

Luby et al., 2013; Moore et al. 2002

Hormones and behaviour: Because testosterone has been correlated with aggression and antisocial behaviour, participants might not want others to know their results.

Ehrenkrantz et al. 1974

Genes and behaviour: Studies on genetics often focus on sensitive topics, like antisocial behaviour. When studying such behaviours (e.g. child abuse and violence), anonymity becomes an important consideration because participants would not want their sensitive details shared with others unless they are given anonymity. For studies on the MAOA gene, participants may also not want others to know which variation they have since this has been correlated with antisocial behaviour.

Baker et al., 2007; Grove et al., 1990; Caspi et al. (2002);

Critical Thinking Considerations

- Are there any limitations in giving anonymity to participants? Can you think of any circumstances or reasons why not giving 100% anonymity might be beneficial? For example, what if severe cases of neglect or abuse are discovered during a study – should researchers break any agreements guaranteeing anonymity or should they stick to this guideline?

Exam Tips

- SAQs are most likely to ask about one research method and/or ethical consideration. Essay questions should allow you to write about one or more.
- An explanation of ethical considerations is most effective when it is linked to common research methodology used to study a particular topic, hence the layout of these review materials. However, you can still write about anonymity in true experiments and/or informed consent in correlational studies.

3 Cognitive Approach

Cognitive Approach to Understanding Human Behaviour

Topic	Content
Cognitive processing	<ul style="list-style-type: none">• Models of memory<ul style="list-style-type: none">• <i>Multi-store model</i>• <i>Working memory model</i>• Schema theory<ul style="list-style-type: none">• <i>Cognitive schema</i>• Thinking and decision making<ul style="list-style-type: none">• <i>Rational (controlled)</i>• <i>Intuitive thinking (automatic)</i>
Reliability of cognitive processing	<ul style="list-style-type: none">• Reconstructive memory• Bias in thinking and decision making
Emotion and cognition	<ul style="list-style-type: none">• The influence of emotion on other cognitive processes
Ethical considerations and research methods	<ul style="list-style-type: none">• Students need to understand the use of research methods and relevant ethical considerations for each <u>topic</u>.

Terms in *italics* may be used in short-answer questions from May 2020 onwards.

Cognitive Approach to Understanding Human Behaviour

Content	Key Questions	Key Studies
Models of memory <ul style="list-style-type: none"> Multi-store model Working memory model 	<p><i>How does the multi-store model explain memory formation?</i></p> <p><i>How does the working memory model explain short-term memory?</i></p>	<p>MSM</p> <ul style="list-style-type: none"> Peterson and Peterson (1959) Milner and Scoville (1957) Glanzer and Cunitz (1966) <p>WMM</p> <ul style="list-style-type: none"> Robbins et al. (1996) Klingberg et al. (2005) Cain et al. (2016)
Schema theory	<i>How does our mind use cognitive schemas to make sense of the world?</i>	<ul style="list-style-type: none"> Bransford and Johnson (1972) Stone et al. (2010) Cohen et al. (1981)
Thinking and decision making	<i>What is one model or theory of thinking and decision making?</i>	<ul style="list-style-type: none"> Kahneman and Tversky (1974) Bechara et al. (2000) Roth (1979)
Reconstructive memory	<i>How does the misinformation effect demonstrate the reconstructive nature of memory?</i>	<ul style="list-style-type: none"> Loftus and Palmer (1974) Shaw and Porter (2015) Loftus and Pickrell (1995)
Biases in thinking and decision making	<i>How can one or more biases in thinking and decision making be demonstrated in studies?</i>	<ul style="list-style-type: none"> Stone et al. (2010) Cohen et al. (1981) Kahneman and Tversky (1974)
The influence of emotion on cognition	<i>How can emotion affect cognition?</i>	<ul style="list-style-type: none"> Buchanan and Lovallo (2001) Luethi and Sandi (2009) Sapolsky et al. (1990) Luby et al. (2013)

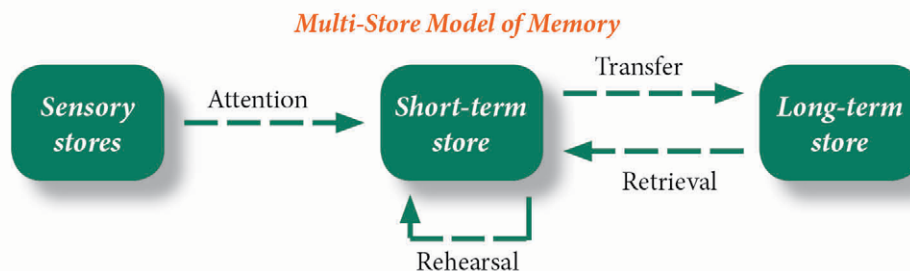
- All answers should be supported by evidence.
- Essay responses in Paper 1, Part B should include critical evaluation of the answer and the evidence.
- Students should also be prepared to discuss research methods and ethical considerations related to the relevant studies for the above topics.

Models of Memory

Multi-store model

How does the multi-store model explain memory formation?

The multi-store model of memory attempts to explain the formation of memories by identifying multiple stores and explaining how information travels between them.



Key Details

- There are numerous versions of the multi-store model (MSM), but Atkinson and Shiffrin's that was proposed in 1968 is the most well-known. Atkinson and Shiffrin's MSM was based on a lot of prior research on memory processes, such as Peterson and Peterson's work on short-term duration.
- **Separate stores:** The MSM posits that our memory is composed of three separate stores of information: the sensory stores, short-term store and the long-term store.
- **Control Processes:** Memory is transferred between the stores by the control processes: sensory to STS

through *attention*, STS to long-term store through *rehearsal* and from LTS back to the STS through *retrieval*.

- **Duration and Capacity:** The stores differ in terms of their duration (see table on the next page).
- Another claim of the MSM is that the more rehearsal there is, the stronger the memory trace (the biological change in the brain that supports the memory).
- The MSM led to other developments in cognitive science, like the working memory model.

Key Study

Trigrams and STS duration (Peterson and Peterson, 1959): This study supports the claim that our short-term store is limited in duration and only lasts about 20 seconds. Participants tried to remember meaningless trigrams (consonant triplets, e.g. PTR, MPT, XTB). After they heard the trigrams, they were asked to count backwards in 3s from a random number to prevent rehearsal so that the information couldn't travel to the LTS. They did this for 0, 6, 12 or 18 seconds. The results

showed that as the time delay was increased, memory for the trigrams decreased. After about 18 seconds, there was almost zero recollection of the trigrams. Because the rehearsal from STS to LTS was inhibited through a distraction task, the researchers could measure the average duration of the STS and conclude that it is about 20 seconds. This provides evidence for the claim that our STS is limited in duration and transfer to the LTS is needed for long-term memory.

Exam Tips

- Studies won't support every claim of the model but will support specific claims instead. Make sure you can clearly explain how studies support specific claims of the models or theories you are explaining.
- In any exam question about the MSM, make sure you can fully summarize the model and draw an accurate diagram.
- When asked to outline or describe a model of memory in an SAQ, a common error is to focus too much on a supporting study and not enough on the description of the model. Make sure you can provide a *detailed* description of the model first before you use a study.

Extension: More Evidence for the MSM

- Serial position effect (primacy and recency effects): This is a cognitive phenomenon whereby people tend to remember the first (primacy) and last (recency) items in a series. This provides evidence for the MSM: people tend to remember the first items because they have longer to rehearse the information and they may have paid more attention to it, so it has a higher probability of being transferred to the LTS. They tend to remember the most recent information because it is still in their

STS. Information in the middle may be lost because of the limited capacity of the STS. This can be shown in the Glanzer and Cunitz's study.

- Biological evidence: One way for a cognitive model or theory to be strengthened is to find the biological evidence for the processes and structures it describes. Case studies on patients with brain damage have provided such evidence (see below).

Further Studies

Primacy and Recency Effects (Glanzer and Cunitz, 1966): In one of their experiments, 46 participants heard 15 words and were asked to remember them. The researchers used a repeated measures design by testing subjects individually and randomizing the order they experienced these three conditions:

1. Immediate Free Recall Condition (IFR): wrote words down immediately after hearing them
2. Delayed Free Recall Condition (DRF) - 10 seconds: wrote words down after a delay of 10 seconds.
3. Delayed Free Recall Condition (DRF) - 30 seconds: wrote words down after a delay of 30 seconds.

Like Peterson and Peterson's study, participants had a distraction task during the delay and had to count backwards in 3s to prevent further rehearsal. The results showed that when there was no delay in recall (IFR), the primacy and recency effect was demonstrated as per usual (participants remember about 70% of the first and last words). However, in the DFR-30 group, only the primacy effect was present and the recency effect was gone (only 30% words remembered – about average for all words). This is further support for the MSM because it shows that the rehearsal has not changed the transfer to the LTS (because the primacy effect still exists). On the other hand, the recency effect has gone because there was no time for

rehearsal (because of the distraction task) and the 30-second delay was longer than the short-term store's capacity, so the memories were lost.

HM's case study

(Milner and Scoville, 1957): The case study of HM, who had his hippocampus removed, provides some support for the idea that our memory is composed of different stores and that memory needs to be transferred from the STS to the LTS in order to be retrieved. HM had his hippocampus removed to cure his epilepsy. The result was that while HM could hold information in his STS if he kept rehearsing it, it would not transfer to his LTS. This provides biological evidence for the fact that there are different stores because if all of our memories were stored in the same place and no transfer was needed, HM would not be able to use one memory (STS) while not being able to transfer these to another (LTS). It also suggests that there is a biological component (e.g. the hippocampus) responsible for memory consolidation (the transfer of memory from the STS to the LTS).



Use this code to read more about this study.

Critical Thinking Considerations

- How has the MSM contributed to the field of cognitive science? *Hint: think about the working memory model.*
- Can the MSM be equally applied to explain the formation and storage of all types of memory? For example, does it apply equally to declarative and procedural memory?
- Does the MSM take into consideration the role of emotion and the accompanying role of biological factors in memory?
- Do we need to rehearse all information in order to remember it? Can you think of exceptions?
- Are there generalizability issues in any of the above studies? For example, do they suffer from a lack of mundane realism?

5 HL Extensions

As a Higher Level IB Psychology student, you get the opportunity to explore some really interesting extra topics. The topics, concepts and research used in this chapter are designed to build on your existing learning from the other units.

The material from the extensions will be assessed in Paper 1, Part B (essays). One, two or all three of the essay questions will be based on the HL extension material.

A good strategy is to prepare one extension for the exams. You should also choose one approach that is the same as the extension you feel most confident with. This means that you do not have to review lots of studies for all three approaches.

For example, you may decide to prepare the biological approach + animal studies extension for essays. You would skip the other extensions. This means that no matter what essay question comes up under the biological approach, you would be able to write about it. This will also allow you to exploit the overlaps in content between the core topics and the extensions because many of the same studies can be used for both.

Biological Approach: Animal Studies

The theme of this topic is the value of using animal models to provide insight into the role of genetics, hormones, and brain function in human behaviour.

Cognitive approach: Technology and Cognition

The major theme of this topic is the positive and negative effects of technology on cognitive processes and their reliability.

Sociocultural Approach: Globalization

The major theme of this topic is how individuals may be influenced by changes occurring in the physical and cultural environment as a result of globalization.

Biological Approach - HL Extensions

Biological approach: The role of animal research in understanding human behaviour

- The value of animal models in psychological research
- Whether animal research can provide insight into human behaviour
- Ethical considerations in animal research

	Core Topics	Core Concepts	Supporting Studies
Animal models	The brain and behaviour	<i>The value of animal models is that they can provide insight into localization of function and how damage to the brain may affect behaviour.</i>	<ul style="list-style-type: none"> • Weiskrantz (1956) <ul style="list-style-type: none"> • SM's case study (Feinstein et al. 2012) • Rosenzweig and Bennett (1960s) <ul style="list-style-type: none"> • Perry and Pollard (1997) • Luby et al. (2013) • Sapolsky (1990)
	Hormones and behaviour	<i>The value of animal models is that they can provide insight into how hormones may affect behaviour.</i>	<ul style="list-style-type: none"> • Sapolsky (1990) <ul style="list-style-type: none"> • Luby et al. (2013) • Albert et al. (1986) <ul style="list-style-type: none"> • Radke et al. (2015)
	Genetics and behaviour	<i>The value of animal models is that they can provide insight into how genetics may affect behaviour.</i>	<ul style="list-style-type: none"> • Van Oortmerssen and Bakker (1981) <ul style="list-style-type: none"> • Mosienko et al. (2012) <ul style="list-style-type: none"> • Caspi et al. (2002)
Ethical considerations in animal research	The brain and behaviour	<i>Psychologists need to consider the justifications for harming animals in order to study genetics and behaviour. Where harm is justified, they should keep suffering to a minimum.</i>	<ul style="list-style-type: none"> • Weiskrantz (1956) • Sapolsky (1990)
	Hormones and behaviour		<ul style="list-style-type: none"> • Sapolsky (1990) • Albert al (1986)
	Genetics and behaviour		<ul style="list-style-type: none"> • Van Oortmerssen and Bakker (1981) <ul style="list-style-type: none"> • Mosienko (2012)

- *Tip: The biological approach extensions have the most predictable questions and if you can comprehend the explanations provided in these topics, you could write excellent answers. However, the material tends to be more complex than the cognitive approach.*

Animal Research on the Brain and Behaviour

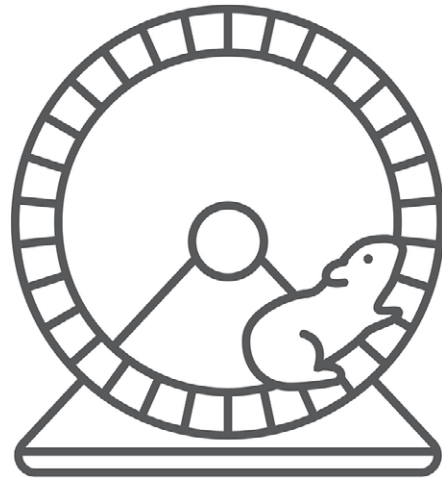
Localization and neuroplasticity

To what extent can animal studies provide insight into relationships between the brain and behaviour?

Non-human animals have neurological similarities that make them valuable in studies on relationships between the brain and behaviour. These studies may provide insight into localization of function and neuroplasticity.

Key Details: Localization

- An **animal model** is the use of non-human animals to demonstrate a biological or psychological phenomenon. For example, **localization of function** is one phenomenon that has been demonstrated using animal models.
- Animals were especially important for research on localization before the invention of modern brain imaging technologies like fMRI. This is because psychologists could research localization of brain function by damaging the brains of animals in experimental research and measuring the effects.
- In these experiments, there are typically two conditions: one condition has a group of animals that have areas of their brain scarred (lesioned) or removed entirely (ablated). There is a control condition that has no damage to the brain. The researchers measure the behaviour of the different conditions, compare them and draw conclusions.
- If the damage to a particular area of the animal's



brain results in a change in behaviour, the researchers can conclude that the part of the brain that was damaged must have some sort of function related to that behaviour.

- The reason why animals are valuable in these experiments is because it would be unethical to conduct these studies on humans (and impractical, too, since humans wouldn't volunteer to have their brain damaged).

Key Studies

Key Study: Lesioning of the amygdala in rhesus monkeys (Weiskrantz, 1956): In this study, the researchers wanted to study the relationship between the amygdala and emotion. Earlier research (in the late 1800s) had found connections between the temporal lobe and emotion. This experiment went one step further by isolating the amygdala as the particular part of the temporal lobe that might be connected with emotion. There were two conditions in the experiment: one group of monkeys had their amygdalae lesioned and the other condition had a different part of the temporal lobe lesioned. The results showed that it was damage to the amygdalae specifically that led to a lack of fear in the monkeys. The use of monkeys in this experiment helped to develop the understanding of the amygdala's role in emotion and fear.

Human Study: SM's case study (Feinstein et al. 2012): The above study provides insight into the role of the amygdala in experiencing emotions, like fear. More modern human studies have supported this connection, like the case study on SM. SM has bilateral amygdala damage and cannot feel fear. Researchers have tested this by observing her behaviour in places like haunted houses, exotic pet stores and when watching scary films (*see localization of brain function in the biological approach for more details*).

Exam Tips

- The value of animal models is that they can provide insight into human behaviour. You have to assess "whether" they can by explaining limitations.
- You can use the effects of hormones on the brain (next topic) for this topic, as well (e.g. Sapolsky, 1990).

Extension: Neuroplasticity

- Animal experiments have also been valuable in studying **neuroplasticity** – the brain’s ability to change as a result of experience.
- Similar to studies on localization, the benefit of animal experiments for neuroplasticity is that researchers can control the extraneous variables and isolate the environmental factor that they think might have an effect on the developing brain.
- Early animal experiments were able to disprove the common belief that the human brain was fixed

from birth. By using rats and putting them in different environments (enriched and deprived), researchers like Rosenzweig and Bennett were able to show how our brain can change depending on the environments we grow up in. This has since been further demonstrated in human studies that compare naturally-occurring environmental variables on the developing brain, including poverty and stress (**see Luby et al. for more information**).

Further Studies

Effects of enriched and deprived environments on the brain (Rosenzweig and Bennett, 1960s): The aim of this study was to investigate the effects of the environment on brain growth and development. Rats were placed in different cages and lived for 30 to 60 days before they were euthanized. A post-mortem study was conducted to measure the thickness and heaviness of the brain cortex as well as the amount of acetylcholine receptors and synapses. Male rats were chosen from different litters (to control for gender and genetics) and were randomly allocated to two different conditions: enriched condition (EC) or the deprived condition (DC). In the EC, there were about 10-12 rats and there were a range of toys that the rats could play with. This group also received “maze training”. On the other hand, in DC they were alone in a cage with no toys and just food and water. The results showed that rats living in the EC developed a heavier and thicker brain cortex. More specifically, the frontal lobes of the rats in the EC were heavier and they had developed more acetylcholine receptors (a neurotransmitter associated with learning and memory). Further studies found that the brain weight of the rats can increase by 7 – 10% and the synapses can increase by about 20% as a result of the EC. The results were quite groundbreaking at the time; the researchers were so surprised by the results that they replicated the research numerous times and obtained the same results with each replication. This study may provide insight into neurological and cognitive developmental differences that are commonly found in human

kids that come from different backgrounds. Similar results have also been found in kids who have come from extremely deprived environments, like Romanian kids who grew up in orphanages.



This code will take you to our blog post with more information on Rosenzweig and Bennett’s study.

Neglect and brain development (Perry and Pollard, 1997): Using MRI scans, this study used naturally-occurring neglect in human children as a variable that was correlated with brain development. They found that kids who suffered from multiple types of neglect (including emotional, physical and social) had reduced volume in their cerebral cortices. This suggests that Rosenzweig and Bennett’s findings also apply to humans.

Correlations between poverty and hippocampal development (Luby et al., 2013): This study used brain scanning techniques to measure correlations between socioeconomic status and brain volume. The results showed that there was a positive correlation between socioeconomic status and development of the amygdala and hippocampus, which suggests findings like Rosenzweig and Bennett’s can also apply to humans (*more details are located in the PTSD chapter*).

Critical Thinking Considerations

- What are the ethical considerations related to using animals to study the brain and behaviour? For example, what are the arguments for and against the justifiable use of animals to further our understanding of human behaviour?
- What factors need to be considered in terms of the generalizability of findings from animal studies to humans? In order to fully explain issues of generalizability, you need to think about differences between animals and humans that might affect the extent to which findings from animals could be applied to humans.
- To what extent has the invention of brain imaging technology made the use of animals in research unnecessary?

6 Human Relationships

The Psychology of Human Relationships

Topic	Content
Personal Relationships	<ul style="list-style-type: none">• Formation of personal relationships• Role of communication• Explanations for why relationships change or end
Group Dynamics	<ul style="list-style-type: none">• Co-operation and competition• Prejudice and discrimination• Origins of conflict and conflict resolution
Social Responsibility	<ul style="list-style-type: none">• Bystanderism• Prosocial behaviour• Promoting prosocial behaviour
Ethical considerations and research methods	<ul style="list-style-type: none">• Students should also be prepared to discuss one or more of the three approaches (biological, cognitive and sociocultural) in relation to each topic• Students should be able to discuss one or more research methods and ethical considerations related to the relevant studies for one or more of the three topics in this option

Psychology of Human Relationships

	Content	Key Questions	Key Studies
Personal relationships	Formation of personal relationships	<i>How can one or more factors affect the formation of personal relationships?</i>	<ul style="list-style-type: none"> • Johnston et al. (2001) • Buss (1989) • Levine et al. (1995) • See also pheromones research
	Role of communication	<i>How can communication affect personal relationships?</i>	<ul style="list-style-type: none"> • Gottman and Levenson (1985& 1992) • Rehman and Holtz-Munro (2007)
	Explanations for why relationships change or end	<i>Why do personal relationships change or end?</i>	<ul style="list-style-type: none"> • Gottman and Levenson (1985& 1992) • Rehman and Holtz-Munro (2007) • Fincham et al. (2000) • Levine et al. (1995)
Group dynamics	Co-operation and competition	<i>What are the causes and/or effects of co-operation and competition?</i>	<ul style="list-style-type: none"> • Sherif et al. (1961) • Bridgeman (1981) • See also studies on aggression
	Prejudice and discrimination	<i>What are the causes and/or effects of prejudice and discrimination?</i>	<ul style="list-style-type: none"> • Lyons-Padilla (2015) • Tajfel and Turner (1971) • Phelps (2000) • Park and Rothbart (1982)
	Origins of conflict and conflict resolution	<i>What are some origins of conflict and how might conflict be resolved?</i>	<ul style="list-style-type: none"> • Sherif et al. (1961) • Park and Rothbart (1982) • Tajfel and Turner (1971) • Pettrigrew and Tropp (2006) • Bridgeman (1981)
Social responsibility	Bystanderism	<i>Why does bystanderism occur?</i>	<ul style="list-style-type: none"> • Darley and Latane (1968) • Levine (1994 & 2001) • Steblay (1987)
	Prosocial behaviour	<i>How can one or more factors affect prosocial behaviour?</i>	<ul style="list-style-type: none"> • Darley and Latane (1968) • Levine (1994 & 2001)) • Steblay (1987) • Batson (1981)
	Promoting prosocial behaviour	<i>How can one or more strategies be used to promote prosocial behaviour?</i>	<ul style="list-style-type: none"> • Cialdini (2008) • Bickman (1974) • Bushman (1988)

- One question will be based on each topic.
- All answers should be supported by evidence.
- Students should also be prepared to discuss one or more of the three approaches (biological, cognitive and sociocultural) in relation to each topic
- Students should be able to discuss one or more research methods and ethical considerations related to the relevant studies for one or more of the three topics in this option.

Formation of Personal Relationships

Attraction and Marriage

How can one or more factors affect the formation of personal relationships?

A major factor affecting the formation of personal relationships is who we find attractive. Humans have evolved to find particular traits attractive because these traits are those that will ensure healthy offspring that have a high chance of survival. However, cultural factors are also important to consider and both may affect whom we form a relationship with.



Key Details

Evolutionary explanations

- **Testosterone:** Humans have evolved to be attracted to members of the opposite sex who have healthy genes and characteristics that will help their offspring to survive. For example, testosterone is the male sex hormone that has been linked to a strong immune system and healthy genes. Thus, it makes sense from an evolutionary perspective for females to want to procreate with a male who is high in testosterone as this will result in healthier children, meaning there is a higher chance the parents' genes will be passed on.
- **Gender roles:** Men and women may have evolved to find different traits attractive, due to the different roles they have in child bearing and rearing. Since females bear the children and have to devote more time and effort towards rearing them, they tend to be attracted

to male partners who have access to more resources (e.g. they have higher social status and more ambition). Males, on the other hand, are more likely to focus on physical characteristics (e.g. youth and physical attractiveness) since these are signs of fertility and healthy genes. Therefore, gender differences in mate preferences could be explained by the different roles each gender has in ensuring the survival of their offspring.

Key Studies

Female preference for high testosterone (Johnston et al., 2001): The aim of this study was to see what types of faces females found more attractive. They had 42 female participants from New Mexico State University manipulate faces on a computer screen until they reached an optimal "target" (e.g. they changed the face until it was what they thought was most attractive). The results showed that when females were ovulating (highest chance of pregnancy) they had a stronger preference for facial features that signal high levels of testosterone. High testosterone could be attractive for a female because this hormone is correlated with a healthy

immune system, so procreating with a man with these features could provide for healthy offspring.

A cross-cultural study on mate preferences (Buss, 1989): The results of this study showed cross-cultural similarities in mate preference for men and women. Traits that can be explained evolutionarily include age (males preferred younger partners and females preferred older partners), qualities such as domestic skills (males desired this more) and social status (females desired this more) (see next page for more details).

Exam Tips

- You can use the same material for this topic as you can for evolution and behaviour and cultural dimensions. For example, if asked about how culture or cultural dimensions influences behaviour, the behaviour you can write about is "personal relationships." You can use the arguments and evidence for pheromones for this topic, too.
- When writing about attraction, be sure to clearly explain how it's linked to the formation of personal relationships.

Extension: Cultural Dimensions

- There may also be differences in what males and females find attractive based on **cultural values** related to **individualism and collectivism**. For example, in collectivist cultures, there tends to be more focus on the well-being of the extended family. This could be why females in these cultures may place more value

on ambition and social status than in individualistic cultures (because marrying a man with these traits can bring pride and wealth to the wider family). These may be more important than other factors like physical attraction (which benefits only the individual)

Further Studies

A cross-cultural study on mate preferences (Buss, 1989): This study provides evidence for the gender and cultural differences in what traits individuals find attractive in the opposite sex. The study was conducted on over 10,000 participants from 37 different cultures. Participants were asked to complete questionnaires on a range of different questions about what they wanted in a romantic partner. The results showed that there were universal differences in preference between men and women in what they found attractive. Traits that can be explained evolutionarily include age (males preferred younger partners and females preferred older partners), qualities such as domestic skills (males desired this more) and social status (females desired this more). They also found differences across cultural dimensions, including collectivist females having a preference for ambition and social status and individualistic males having a tendency to place lower value on domestic skills.

A cross-cultural comparison of the importance of love in marriage and divorce (Levine et al., 1995): This study compared college students from 11 different cultures (a mix of individualistic and collectivist). They gathered their data using questionnaires and one question asked, “If a person had all the qualities you desired, would you marry them if you weren’t in love with them?”

The results showed that students from individualistic cultures like the USA, UK and Australia placed more emphasis on love in a marriage compared to those from more traditional and collectivist cultures, like India, Pakistan and Thailand. Here we can see that in some cultures love is a crucial reason why someone might decide to get married (i.e. form a relationship), whereas in other cultures there are other factors to consider (like the feelings and opinions of extended family members).



To read more about Buss's study check out this blog post.

Critical Thinking Considerations

- What are the strengths and limitations of the supporting research? *See the summary of Buss's study for more critical thinking considerations.*
- Buss's study and Johnston et al.'s study could be explained from a biological perspective. However, could it also be explained from a social perspective? For example, how might gender differences in mate preferences be a result of socialization and/or social learning?
- Johnston et al.'s study only looks at female preferences. Why does this give us a limited understanding of how hormones may affect attraction?
- Are there alternative explanations for why females may find a man with high testosterone attractive?
- What are the ethical considerations related to studying factors that affect the formation of relationships?

Role of Communication

Communication Patterns and Marital Satisfaction

How can communication affect personal relationships?

One role of communication in a marriage is that it can help maintain and increase marital satisfaction. However, negative communication patterns might increase the chances of divorce.

Key Details

- Decades of research into marital satisfaction and the factors that predict divorce shows that the way in which a couple communicates is a key factor in marital satisfaction. Dr. John Gottman is a leading researcher in this field and he has concluded that it is not the frequency or intensity of arguments that couples engage in, but rather it is *how* they communicate. Couples who are able to engage in healthy communication patterns are more likely to have higher marital satisfaction and avoid divorce. Thus, one key role of communication in romantic relationships (e.g. marriage) is that it helps couples maintain a healthy and happy relationship.
- Through decades of research, some communication patterns have emerged and have been described. One of these is the **demand/withdraw pattern** (also known as the **wife demand/husband withdraw**, as this is the common trend). Gottman calls this “**stonewalling**.” This common communication pattern been associated with decreases in marital satisfaction.
- The reason this could be associated with increased dissatisfaction in a marriage is that if one partner starts a



conversion or has an issue to discuss with their partner and the other partner withdraws (stonewalls), then that issue is never resolved. This could lead to problems accumulating over time, which explains the increase in dissatisfaction with the marriage, which may ultimately lead to divorce. Stonewalling is also part of what Gottman calls his “Four Horsemen of the Apocalypse,” which are four common patterns of negative communication that are signs of problems in a marriage. The other three are defensiveness, criticism and contempt.

Key Study

Communication and marital satisfaction (Gottman and Levenson, 1992): 73 couples were studied over a four-year period (between 1983-1987). Throughout the duration of the study, the couples would be periodically invited into the “Love Lab” (an ordinary apartment equipped with recording devices) where they would have discussions with one another in the presence of a researcher. The couples did not see each other all day before the interview and they were asked to discuss three topics: one neutral, one pleasant and one that is a source of conflict. The discussions were recorded and the “Rapid Couples Interaction Scoring System (RCISS)” was used to quantify and code the communication patterns. The researchers used the data to identify two groups: regulated and non-regulated couples. A regulated couple was defined as a couple whose ratio of

positive to negative interactions increased throughout the discussion, meaning by the end of the interview their communication was more positive than negative. The regulated couples had higher marital satisfaction, more positive ratings of their interactions and more positive emotional expressions. The non-regulated couples, on the other hand, were almost three times as likely to divorce during the course of the study (19% compared to 7%) and they were also angrier, less affectionate, less joyful and less interested in their partners. The researchers also concluded that a healthy ratio of positive to negative interactions was 5:1. These results show how positive communication can maintain a healthy relationship, whereas negative communication might damage it.

Exam Tips

- The material in this topic can also be used to explain why relationships may change or end.

9 Paper Three Research Methods

- **HL students only**
- **1 hour**
- **24 marks total**
- **5 questions answered (from a possible 9 static questions)**

Question 1 (actually three separate questions): (9 marks total)

You will need to answer *all* three of the following questions in relation to the stimulus provided.

- Identify the research method used and outline two characteristics of the method.
- Describe the sampling method used in the study.
- Suggest an alternative or additional research method giving one reason for your choice.

Question 2: (6 marks)

You will be given *one* of these questions (i.e. you don't choose – only one will appear).

- Describe the ethical considerations that were applied in the study and explain if further ethical considerations could be applied.
- Describe the ethical considerations in reporting the results and explain ethical considerations that could be taken into account when applying the findings of the study.

Question 3: (9 marks)

As with Question 2, you will be given *one* of the following questions:

- Discuss the possibility of generalizing/transferring¹ the findings of the study.
- Discuss how a researcher could ensure that the results of the study are credible.
- Discuss how the researcher in the study could avoid bias.

You will be given a one-page summary of a study, so your revision needs to be based on methodology, *not* on existing studies. Having said that, an effective way to prepare for Paper Three *and* Paper One and/or Two at the same time is to choose a range of different studies (qualitative and quantitative) that you might use in Paper One and/or Two and practice writing Paper Three answers about those studies.

¹ Generalizing is a term used for quantitative studies, whereas transferring is used for qualitative studies. In essence, they mean the same thing – the extent to which we would expect the same results with a different group of participants.

Question 1a: Research Method

1a. Identify the research method used and outline two characteristics of the method.

You need to be able to state the research method used in the stimulus (1 mark) and outline two characteristics of the method (2 marks). Therefore, make sure you know at least two characteristics of the method.

Quantitative Research Methods	
Method	Key characteristics
True experiment (a.k.a. laboratory experiment) <i>(Experimental Method)</i>	a) Examines the effects of an IV on a DV b) The researcher manipulates the IV, so random allocation to the treatment or control condition is possible c) Takes place in a controlled environment and extraneous variables are controlled
Field experiment <i>(Experimental Method)</i>	a) Examines the effects of an IV on a DV b) Takes place in a naturalistic setting c) Control of extraneous variables is not always possible
Quasi-experiment <i>(Experimental Method)</i>	a) Examines the effects of an IV on a DV b) One or more conditions of a true experiment can't be met, e.g. no random allocation is possible c) "In quasi-experiments, participants are grouped based on a characteristic of interest, such as gender, ethnicity, or scores on a depression scale" (IB Psychology Guide, p. 37)
Natural experiment <i>(Experimental Method)</i>	a) Examines the effects of an IV on a DV b) The IV is naturally occurring c) Extraneous variables may not always be controlled Note: there is often not a clear distinction between a quasi-experiment and a natural experiment.
Correlational study <i>(Non-experimental method)</i>	a) Does not have an IV or DV, but has co-variables b) Tests the strength of relationships of co-variables by calculating a correlation coefficient c) Values of coefficients range from -1.0 to 1.0
Case study <i>(Non-experimental method)</i>	a) An in-depth investigation of an individual, small group or organization b) Multiple methods are used to gather data (which is what makes them "in-depth") c) They often use a combination of quantitative and qualitative methods
Survey²	a) Gathers data on a large number of participants b) Uses data gathering techniques such as questionnaires c) Often calculates correlations between co-variables

² This is unlikely to be a research method used in the stimulus material, but it is mentioned in the guide.

Qualitative Research Methods

<i>Method</i>	<i>Key characteristics</i>
Naturalistic observations	<ul style="list-style-type: none"> a) Subjects' behaviour is observed in a naturalistic environment b) Field notes and other data gathering techniques are used c) Observations may be followed by interviews
Covert and overt observations	<ul style="list-style-type: none"> a) Covert = subjects are not aware they are being observed b) Overt = subjects are aware they are being observed c) Usually take place in naturalistic environments in qualitative research
Participant and non-participant observations	<ul style="list-style-type: none"> a) Participant = the researcher becomes a member of the group they are observing b) Non-participant = the researcher stays removed from the group they are observing
Qualitative interviews	<ul style="list-style-type: none"> a) Face-to-face discussion involving the researcher asking questions to the participants b) The researcher gathers qualitative data c) There are many different types of qualitative interviews (see below)
Semi-structured interviews	<ul style="list-style-type: none"> a) An interview that follows an interview schedule – it includes an outline of topics to be covered, but allows for deviation and elaboration b) Can include a combination of open and closed questions c) It resembles a conversation
Unstructured interviews	<ul style="list-style-type: none"> a) The interviewer has topics to cover, but there is a lot of freedom and the precise questions and order are not fixed b) Can include open and closed questions c) The interview evolves as a result of the interactions between the researcher and the interviewee
Focus group interviews	<ul style="list-style-type: none"> a) A group interview (about 6-10 participants) b) Focus groups rely on group processes and the interaction of individuals to help reveal information that might not be revealed in individual interviews c) The interviewer acts as a moderator and, if done well, the interview will resemble a group discussion

Example Essay

To what extent do genes influence human behaviour?	Comments
<p><i>One gene that has been linked with behaviour is the MAOA gene, which the media has called the “warrior” gene because of its connections with antisocial behaviour and aggression. The effects of the MAOA gene could be explained by its influence on brain activity, as shown in Meyer-Lindenberg’s study. However, Caspi et al.’s study shows that the gene alone doesn’t influence behaviour and childhood abuse is also important to consider. Other factors such as culture and social learning could also be important factors to consider, as well.</i></p> <p><i>To begin with, expression of the MAOA gene could affect brain activity, which is why it might be linked with aggressive behaviour. Genes are sequences of DNA that are found in chromosomes in cells. When a gene is expressed, it sends messages from the cells that trigger other reactions in the body, including neurotransmission activity in the brain. The effects of gene expression on brain activity could be how genes, such as the MAOA gene, can influence human behaviours like aggression.</i></p> <p><i>Gene expression of the MAOA gene produces an enzyme (monoamine oxidase A) that affects neurotransmission. Some variants of the MAOA gene have less gene expression. These variants are collectively known as MAOA-L. The reduced expression could explain why studies have shown that people with the reduced MAOA gene variation have differences in brain activity when perceiving emotional stimuli. This could explain increases in impulsive-reactive aggression.</i></p> <p><i>For example, Meyer-Lindenberg (2008) studied MAOA gene variants and brain function. This study compared the brain function of two groups of healthy participants. One group had high expressing MAOA gene (MAOA-H), whereas another group had the variant that has low expression of the MAOA gene, which is the type correlated with aggressive behaviour (MAOA-L). When viewing angry and fearful faces in an fMRI, the MAOA-L group had significantly increased activity in their amygdala and reduced activity in their prefrontal cortex.</i></p> <p><i>This could explain the link with aggression since negative emotions (such as anger, which is closely tied with aggression) are generated in the amygdala, so perhaps increased amygdala activity could increase negative emotions and aggression. This, coupled with the reduced activity in the PFC (which can top-down regulate the emotion generated in the amygdala and inhibit impulsive behaviour), could lessen an individual’s potential to reduce their anger and ability to control their behaviour, resulting in reactive aggression when they are in confrontational situations. So, with an increased emotional arousal and inability to regulate emotion or impulsive actions, MAOA-L carriers may be prone to impulsive-reactive aggression.</i></p> <p><i>However, one limitation of the research methodology of this study is that it took place in an fMRI and they did not actually directly measure aggression. There is an assumption being made that a person with reduced PFC activity would react aggressively, but this might not necessarily be true.</i></p> <p><i>Furthermore, there are alternative explanations as other studies have shown that people with the MAOA-L variation who have experienced trauma or abuse as a child are more prone to being aggressive and antisocial adults (compared with those who have the MAOA-L gene without experiencing childhood abuse). This suggests it is not just genetics that influence this behavior.</i></p> <p><i>For example, Caspi et al.’s longitudinal study of MAOA-L variants, childhood abuse and antisocial behaviour (a.k.a. “The Dunedin Study”) followed over 1,000 children in New Zealand across 25 years and took measures every few years. They found that the</i></p>	<p>The introduction begins by restating the question (this guarantees one mark).</p> <p>The intro also outlines the essay by stating the central argument, the studies and the counter-arguments.</p> <p>Relevant details of genetics are described and their relevance to the question is made very clear. This explanation shows knowledge and understanding.</p> <p>The explanation of the link between genes and behaviour is further elaborated.</p> <p>Relevant details of the supporting study are described. This scores points for use of research.</p> <p>The significance of the study is clearly explained and linked back to the question.</p> <p>Critical thinking is shown by explaining a limitation of the study (counter-points don’t have to come at the very end).</p> <p>The studies are used effectively in supporting the argument and meeting the demands of the command</p>

MAOA-L gene moderated the effects of experiencing child abuse on adult aggression – that is to say, those participants with the MAOA-L gene variant and who were abused were more likely to be antisocial and aggressive adults.

However, aggression is not only affected by genetics and other biological factors; another alternative explanation is that our social and cultural environment could be influential, as well. For example, according to Bandura’s social cognitive theory, aggression can be a learned behaviour caused by observing others’ violent actions and being motivated to copy them. Similarly, if an individual is born into a cultural environment with a “culture of honour,” you may be more likely to value defending yourself when you are threatened and less likely to “turn the other cheek,” which is another factor to consider when explaining aggression, especially impulsive-reactive aggression.

In his famous study, Bandura showed that young children (aged 4-6) could be influenced by social learning and this could affect their aggressive behaviour. Kids in the first condition watched an adult model behaving aggressively towards an inflatable clown doll while in the control group the kids did not watch any model. They were then placed in the same room as the doll and their aggressive behaviour was recorded. The results showed that those kids who watched the aggressive model were more likely to react aggressively. This suggests that aggression is not just genetic but that it can be influenced by what we see in our environment, as well.

These results might provide an alternative explanation for Caspi et al.’s findings that child abuse was more likely to lead to aggression; perhaps participants in Caspi’s study observed violence when they were children and were more likely to copy it when they got older. Therefore, it might not have been the genes or the abuse but instead it may have been about social learning.

One final factor to consider is the area of uncertainty about the extent to which genetic explanations can explain all types of aggression. This answer has mostly focused on one type of aggression: reactive aggression, as this is what Cohen studied and is also what is measured in fMRI studies like Meyer-Lindenberg’s. These explanations do not necessarily cover other types of aggression and anti-social behaviour such as unprovoked aggression (when the aggression comes from a person who has not been threatened).

In conclusion, while the MAOA gene has been linked with aggression and this link could be explained by looking at its effects on brain activity, it is not the only factor that we need to consider when explaining behaviour. (approximately 1,000 words)

term (to what extent...)

Critical thinking is shown in the counter-arguments by explaining a range of points that address the “to what extent” command term.

The counter-arguments demonstrate an ability to evaluate research and provide alternative explanations.

A third study is used and it’s relevant to the question.

The conclusion to this study explains its relevance to genetics.

An alternative explanation is given for previous results. This links both studies together nicely.

A third counter-argument is provided, which is showing a range of critical thinking.

The conclusion is clear and concise.