

Pearson Edexcel Level 1/Level 2 (9–1) GCSE Psychology

Topic Guide 9

Sleep and dreaming – Why do you need to sleep and dream?

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Sleep and dreaming – why do you need to sleep and dream?

Specification requirements

This topic is an optional topic and will be examined in Paper 2.

Candidates are expected to demonstrate and apply the knowledge, understanding and skills described in the content.

To demonstrate their **knowledge**, candidates should undertake a range of activities, including the ability to recall, describe and define, as appropriate.

To demonstrate their **understanding**, candidates should explain ideas and use their knowledge to apply, analyse, interpret and evaluate, as appropriate.

Candidates may be asked to consider the following issues when **evaluating** studies:

- validity
- reliability
- generalisability
- ethics
- objectivity
- subjectivity.

Candidates may be required to **apply** their understanding – for example by responding to scenarios that are drawn from the topic area and/or associated research – and in doing this they should use psychological concepts, theories and/or research from within their studies of sleep and dreaming.

Opportunities for practical activities

Candidates should gain hands-on experience of carrying out ethical, investigative activities to aid their understanding of this subject. To help centres identify opportunities for carrying out these activities, studies that can be replicated have been marked with an asterisk.

Research methods are delivered in Topic 11. However, as a way to aid candidates in evaluating the studies, centres can encourage them to consider the methodology of the key studies as they progress through each individual topic. For example, candidates could consider the generalisability of a single participant sample for testing sleep when studying **Siffre (1975)** (9.2.2).

Although candidates will not be directly assessed on practical activities, the experience they gain will give them a better understanding of this subject and may enhance their examination performance.

Guidance

9.1 Content

9.1.1 Understand the functions, features and benefits of sleep, including:

- a. the four sleep stages
- b. rapid eye movement (REM) sleep
- c. the sleep cycle

Candidates should be able to explain the **four sleep stages** (9.1.1a) and the brain waves associated with these. Stage 1, which occurs between wakefulness and sleep, and is sometimes referred to as somnolence, and Stage 2, where consciousness of the outside world fades and muscle activity decreases, are distinct stages. These are followed by Stage 3 where a person produces slow brain waves that are interspersed with faster waves and, finally, Stage 4 where a person is in deep sleep. Often Stages 3 and 4 are combined when explaining sleep.

Candidates should know that it is in **REM sleep** (9.1.1b) that dreaming occurs, and that brain waves reach similar levels of activity to when a person is awake. It may be interesting for candidates to know that the percentage of REM sleep can differ by age, with children having more REM sleep than adults. Candidates may also wish to develop their understanding of the associations between sleep and learning, and sleep and memory. Centres may wish to teach **activation synthesis theory (9.1.5)** at this stage as an explanation of how dreaming is considered to be a result of brain activity during REM sleep.

The **sleep cycle** (9.1.1c) is the process by which people will pass through the **four sleep stages** (9.1.1a) and **REM sleep** (9.1.1b) in succession several times during a full sleep. If a person is missing any of the stages of sleep it can negatively affect their physiological and psychological functioning. If they are able to, candidates may find it interesting to use a sleep 'app' to track their own sleep cycles. Health and wellbeing benefits of sleep should be explored with the candidates, for example sleep inertia.

Application of these concepts to stimulus materials would benefit candidates. Centres could develop scenarios and examples from which candidates can identify the key features and processes of sleep evident in the scenario and describe them in relation to the key concepts.

Andy is taking part in a sleep study. His sleep cycle is being monitored by a sleep specialist using a brain wave monitoring machine. At the moment, the machine is recording slow, delta waves. What stage of sleep is Andy in?

9.1.2 Understand the internal and external influences on sleep, including strengths and weaknesses of sleep cycle explanations:

- a. bodily rhythms, to include circadian and ultradian rhythms
- b. hormones, to include pineal gland and melatonin
- c. zeitgebers, to include light

Candidates should know the difference between the types of **bodily rhythms** (9.1.2a), for example that an **ultradian rhythm** takes place over a day, such as a sleep-wake cycle, whereas a **circadian rhythm** is an internal process, such as the 'body clock'. Cues from external **zeitgebers** (9.1.2c), such as light, can influence circadian rhythms and result in sleep problems.

Candidates should understand the role of **hormones** (9.1.2b) such as melatonin, which is made in the pineal gland. Candidates should be able to explain that this is often

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referred to as the sleep hormone, with levels increasing in late evening and throughout the night to bring about sleep, and reducing before waking. Candidates could use examples such as jet-lag, shift-work or seasonal affective disorder (SAD) to aid their understanding of how melatonin, zeitgebers and bodily rhythms interact.

Candidates may benefit from understanding that there is a need for sleep-wake homeostasis as a result of the interactions between internal and external influences on sleep. Therefore if someone has not had enough sleep they will feel tired even if zeitgebers of light indicate it is not dark enough to sleep. Centres may wish to deliver the content of the study by **Siffre (1975)** (9.2.2) as part of the content of this section.

Centres can lead into **sleep disorders** (9.1.3) at this point, making the connection to melatonin as a treatment for sleep disorders such as insomnia.

Application of these concepts to stimulus materials would benefit candidates. Centres could develop scenarios and examples from which candidates can identify the key features and processes of sleep evident in the scenario and describe them in relation to the key concepts.

It is 9.00pm and dark outside, so Andy is feeling tired. What will be happening to Andy's melatonin levels?

Internal and external influences on sleep can be evaluated by looking at which has a more lasting effect on sleep; for example, light or the 'body clock'. Supporting evidence can be used where available, such as **Siffre (1975)** (9.2.2). Equally, supporting evidence can be used where it shows that the theory or explanation may be inaccurate.

Candidates can also judge how useful the theory or explanation is, such as whether there is an application to society; for example, treatments for sleep disorders that stem from an understanding of hormones. Some candidates may benefit from being extended by drawing on the concepts delivered in the 'issues and debates' content, where themes such as how psychology has changed over time could be used to help evaluate explanations.

9.1.3 Understand symptoms and explanations of sleep disorders, including: a. insomnia b. narcolepsy

Candidates should be able to explain the main symptoms of **insomnia** (9.1.3a) and **narcolepsy** (9.1.3b), along with explanations of what these conditions are, how they affect a person and possible causes. It may be beneficial to make the link to 9.1.2 and encourage more able candidates to underpin their explanations of these conditions with knowledge and understanding of the internal and external influences on sleep. Both disorders are explained well on the NHS website.

For **insomnia** (9.1.3a), candidates should be aware that this can be a short- or long-term problem and is a common sleep disorder. **Narcolepsy** (9.1.3b) is less common and is a long-term neurological disorder. It is linked to the brain's inability to control the sleep-wake cycle, hence causing people to fall asleep unexpectedly and without warning.

Application of sleep disorders to stimulus materials would benefit candidates. Centres could develop scenarios and examples from which candidates can identify the key components of sleep disorders evident in the scenario and explain them in relation to the theory.

Andy has been diagnosed with narcolepsy. What can cause narcolepsy? What symptoms might Andy have?

9.1.4 Understand the Freudian theory of dreaming (Freud, 1900), including strengths and weaknesses of the theory:

- a. manifest content**
- b. latent content**
- c. dreamwork**

Candidates should be able to understand that the Freudian theory of dreaming is underpinned by the concept that dreams are a result of unconscious thoughts. They should be able to explain the key features of the theory, for example that **manifest content** (9.1.4a) is what can be remembered from a dream, such as the context, people and so on, and is used to disguise the **latent content** (9.1.4b) of a dream – the elements that people cannot usually recall and the symbolism that gives the real meaning of a dream.

Dreamwork (9.1.4c) is the process by which the 'hidden wish' in the latent content of a dream can be found. Candidates should understand that dreamwork assumes that the latent content becomes manifest through the processes of condensation, displacement, representability and secondary elaboration, and dreamwork therefore uses the manifest content to uncover the latent content that has been adapted through these processes.

Centres may wish to deliver the content of the study **Freud (1909) Little Hans** (9.2.1) to highlight how Freud developed his ideas about Little Hans' phobia of horses, drawing on, amongst other aspects, the dreams reported by Little Hans to his father.

Application of the Freudian theory of dreaming to stimulus materials would benefit candidates. Centres could develop scenarios and examples from which candidates can identify the key components of Freudian dreaming evident in the scenario and explain them in relation to the concepts in this topic.

Mike woke up and remembered his dream. He had dreamt that he was climbing a mountain which was covered in snow made out of shredded paper. Every time Mike got halfway up the mountain, he was pushed down to the bottom again by a large panda bear. Mike told his friend at work about the dream and she said it didn't mean anything. However, Mike believes his dream does have meaning. How would Freudian dream theory explain what Mike can remember of his dream?

The Freudian theory of dreaming can be evaluated through comparisons to other models, theories and explanations. For example, in contrast, the activation synthesis theory suggests that dreams are a product of brain wave activity during REM sleep and not unconscious processes. Supporting evidence can be used where available, such as **Freud (1909) Little Hans** (9.2.1). Equally, supporting evidence can be used where it shows that the theory or explanation may be inaccurate, such as **Hobson and McCarley's (1977) activation synthesis theory** (9.1.5) of dreaming.

Candidates can also judge how useful the theory or explanation is, such as whether there is an application to society; for example, therapies to help people with fears, phobias or anxieties. Some candidates may benefit from being extended by drawing on the concepts delivered in the 'issues and debates' content, where themes such as nature versus nurture could be used to help evaluate explanations.

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9.1.5 Understand activation synthesis theory (Hobson and McCarley, 1977), including strengths and weaknesses of the theory:

- a. random activation
- b. sensory blockade
- c. movement inhibition

Candidates should understand that Hobson and McCarley (1977) proposed **activation synthesis theory** (9.1.5) as a neurobiological explanation of dreaming, claiming dreams are what happens when people try to make sense of the brain activity that happens during REM sleep. Centres may wish to deliver this within **REM sleep** (9.1.1b) or could deliver this independently as an explanation of dreaming.

In activation synthesis theory, dreaming is considered to be a product of the **random activation** (9.1.5a) of brain activity during REM sleep that is then synthesised into a sequence order to make sense. Candidates should be able to explain that a neuron is 'randomly activated', which is said to link to a memory or thought.

During REM sleep a **sensory blockade** (9.1.5b) prevents any information from the senses entering through sensory input (sight, sound, taste, touch or smell). **Movement inhibition** (9.1.5c) is where the body is unable to make any physical movements. Candidates should understand that sensory blockade and movement inhibition leave a person with no external input and no physical output. Candidates should be able to link these concepts to their understanding of REM brain wave activity.

Application of this explanation of dreaming to stimulus materials would benefit candidates. Centres could develop scenarios and examples from which candidates can identify the key components of activation synthesis evident in the scenario and explain them in relation to the concepts in this topic.

Mike woke up and remembered his dream. He had dreamt that he was climbing a mountain which was covered in snow made out of shredded paper. Every time Mike got halfway up the mountain, he was pushed down to the bottom again by a large panda bear. Mike told his friend at work about the dream and she said it must have some hidden meaning. However, Mike does not believe his dream has any meaning. How would activation synthesis theory explain Mike's dream?

Activation synthesis theory could be evaluated through comparison to the Freudian theory of dreaming: although it explains how dreams are formed it does not explain what purpose they serve. Supporting evidence can be used where available and, equally, can be used where it shows that the theory or explanation may be inaccurate, for example evidence from lucid dreaming.

Candidates can also judge how useful the theory or explanation is, such as whether there is an application to society. Some candidates may benefit from being extended by drawing on the concepts delivered in the 'issues and debates' content, where themes could be used to evaluate explanations.

9.2 Studies

Candidates should understand the aims, procedures and findings (results and conclusions), and strengths and weaknesses of:

9.2.1 Freud (1909) Little Hans: analysis of a phobia in a five-year-old boy

9.2.2 Siffre (1975) Six months alone in a cave

Study One

Freud (1909) Little Hans: analysis of a phobia in a five-year-old boy.

This case study has been summarised to highlight the examples of dreamwork. It may benefit candidates to understand that the case study formulated ideas about the Oedipus complex through methods other than just dream analysis.

Aim(s)

To describe the course of an illness and the subsequent recovery of a five-year-old boy.

Content

Sample: one child studied as a case study from three to five years old.

First reports on the behaviour and actions of Hans began in 1906 and were recorded by his father and explained to Freud for his analysis (as is the case throughout the study). During this time, Hans developed a phobia of horses, which was explored through his father's reports to Freud of conversations with Hans, phantasies that Hans had, and his dreams.

Hans' dreams are recorded from 1907 onwards – one year into the case study – where previously recorded data has focussed on the interactions, questions and behaviour of Hans.

"Today when I was asleep I thought I was at Gmunden¹ with Mariedl²."
As Hans's father was telling his mother the dream in his presence, she corrected him, saying: "Not with Mariedl, but quite alone with Mariedl."

Source: Freud (1909) p.12

Freud interpreted this dream to mean that Hans wanted to go back to the Gmunden resort and spend time with his female friend Mariedl. It later transpired that there were horses at Gmunden that Hans talked about, mainly describing his fear of them biting him.

"I say, last night I thought: some one said; 'who wants to come to me?' Then some one said; 'I do'. Then he had to make him widdle."
Further questions made it clear that there was no visual content whatever in this dream, and that it was of the purely auditory type.

Source: Freud (1909) p.19

Freud believed this was the first dream Hans had shared that was unrecognisable because of distortion. However, Freud interpreted this (assisted by Hans's father) to represent a game of forfeits Hans had been playing. He believed that the speech heard by Hans derived from speech heard/spoken in the days preceding the dream.

¹ Gmunden is a holiday resort in the Austrian lakes.

² Mariedl is a 13-year-old girl who used to play with Little Hans

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Hans (aged four and three-quarters) woke up one morning in tears. Asked why he was crying, he said to his mother: "When I was asleep I thought you were gone and I had no Mummy to coax [caress/cuddle] with."

Source: Freud (1909) p.23

This was interpreted as an anxiety dream, where Hans showed a fear of losing his mother, highlighting that his affection towards his mother had intensified.

Shortly after this dream, Hans was with his mother when he saw a horse and became anxious that the horse would bite him. Freud claimed this was Hans's anxiety about losing his mother being displaced onto an object (the horse).

Discussion

The dream representing being made to 'widdle' expressed a wish that one of his female friends should help him with his 'widdler'. This is interpreted to show Hans's sexual curiosity developing.

His dream of his mother leaving was interpreted as an expression of his fear of losing his mother, as he was in the process of resolving the Oedipus complex (where a boy fantasises about his mother and fears his father will find out and castrate him). Hans expressed this complex through play and phantasy, for example playing 'daddy' and telling his own father that the children's 'mummy' in the game was his own 'mummy'.

This fear of losing his mother was displaced as his phobia of horses very soon after this dream of being left without her. The horse also became a representation of his father who Hans was believed to fear because of his own affections and sexual curiosity towards his mother.

Once Hans had resolved the Oedipus complex and passed through his castration fears, his phobia of horses ended.

Conclusions

Hans's anxiety and phobia were a result of 'castration complex' and were resolved through phantasies that Hans considered and the dreams he had which led to the resolution of the Oedipus complex in 1908.

Freud claimed that Hans was not a normal child, that he was prone to neurosis, and therefore stated that his findings from the analysis might not apply to other children. However, Hans returned in 1922 to meet with Freud and was a normal, healthy individual.

Candidates may be asked to consider the following issues when **evaluating** studies:

- validity
- reliability
- generalisability
- ethics
- objectivity
- subjectivity.

Information for centres

It is recommended that, wherever possible, centres combine the use of the summary of studies resource with the original study. However, where studies are not freely available or easily accessible, the summary resource is designed to help provide key starting points to enable teachers to deliver the content.

Study Two

Siffre (1975) Six months alone in a cave.

Aim(s)

To investigate the effects of living underground in a cave without external cues on the 24-hour sleep-wake cycle.

Procedure

Sample: one male participant aged 33 years.

Siffre lived in an underground cave in Texas for six months where he was isolated from the sun and other reminders of the passing of time.

He entered the cave on 14th February and left on 5th September (although the latter four weeks were not spent in isolation as he was being tested for other physiological and psychological effects of the study).

Electrodes were used to monitor heart, brain and muscle activity during the time he spent in the cave.

Each time he awakened, he telephoned a team above ground to let them know he was awake. To ensure that it was not clear what time of day it was, the telephone conversations were kept short. There was light from lamps in the cave and these were switched on and off when Siffre telephoned to say he was awake or feeling sleepy.

During the awake periods, Siffre conducted tests on himself.

These included:

- recording blood pressure
- tasks to measure mental acuity
- tasks to measure memory
- tasks to measure physical dexterity, including:
 - a cycle machine to cycle 3 miles
 - firing a pellet rifle to test coordination
 - threading beads on string.

He shaved daily, keeping and weighing the beard trimmings to test for a male hormonal cycle.

Siffre needed to clean the cave daily to remove a white dust from the decay of the rocks as it was a risk to his health (causing a pulmonary disease called histoplasmosis).

Result(s)

Several psychological and physiological deteriorations were recorded:

- memory became poor
- confusing thoughts, emotions and panic
- low mood
- poor dexterity.

Siffre's sleep-wake cycle ranged from 18 to 51¾ hours, although each cycle felt like a 'day' to him. A 48-hour sleep-wake cycle was common in two different extended periods of time. Time spent awake was usually far greater than time spent asleep during most sleep-wake cycles.

At the end of the sleep component of the study, Siffre believed it to be mid-July, although it was in fact 10th August.

Conclusion

Siffre experienced lasting effects of his time in the cave away from daylight and sleep-wake cycle zeitgebers, including memory lapses and weakened eyesight. This highlights the importance of cues and bodily rhythms.

There is a tendency for the sleep-wake cycle to become a 48-hour cycle rather than the 24-hour cycle that is normal in an environment with zeitgebers and external cues.

The study highlighted potential serious concerns for NASA in regard to long-range space travel where the effects of disruption to the sleep-wake cycle as a result of isolation from external cues could result in grave deterioration of manual and mental dexterity.

Candidates may be asked to consider the following issues when **evaluating** studies:

- validity
- reliability
- generalisability
- ethics
- objectivity
- subjectivity.

Information for centres

It is recommended that, wherever possible, centres combine the use of the summary of studies resource with the original study. However, where studies are not freely available or easily accessible, the summary resource is designed to help provide key starting points to enable teachers to deliver the content.

9.3 Issues and debates

The issues and debates content delivered in each compulsory topic, including research methods, is designed to enable candidates to understand the wider issues in psychology that underpin psychological knowledge and research.

Issues and debates will be specifically assessed in Paper 1 through an extended open-response question.

The issue of **'the contribution of psychology to an understanding of the individual'** has been placed within the compulsory topic area of *development* through morality.

The issue of **'reductionism/holism'** has been placed within the compulsory topic area of *memory*.

The issue of **'nature/nurture'** has been placed within the compulsory topic area of *psychological problems*.

The issue of **'how psychological knowledge and ideas change over time and how these inform our understanding of behaviour'** has been placed within the compulsory topic area of the *brain and neuropsychology*.

The issue of **'the contribution of psychology to an understanding of individual, social and cultural diversity'** has been placed within the compulsory topic area of *social influence*.

The issue of **'develop an understanding of ethical issues in psychology'** has been placed within the compulsory topic area of *research methods* because it allows for links to be made across all research methodology.

Candidates can, however, draw upon issues and debates in their evaluations and extended open essays across each topic area (compulsory and/or optional), and while this is not an expected feature of responses, it may – if appropriate, accurate and relevant – be creditworthy. For example, they may wish to draw upon ethical considerations when evaluating key studies.

Resources and references

Studies

9.2.1 Freud (1909) Little Hans: analysis of a phobia in a five-year-old boy

Freud, S. (1909) translated by Strachey, J. (2001) (ed.) in *Volume X: Two Case Histories: 'Little Hans' and 'Rat Man'*. *The standard edition of the complete works of Sigmund Freud*. London: Vintage.

<http://clearwalksoft.com/society-social-sciences/41053-the-complete-psychological-works-of-sigmund-freud-two-case-histories-quotlittle-hansquot-and-quotthe-rat-manquot-v-10.html>

<http://holybooks.lichtenbergpress.netdna-cdn.com/wp-content/uploads/Sigmund-Freud-The-Complete-Works.pdf>

<http://www.garysturt.free-online.co.uk/freud.htm>

9.2.2 Siffre (1975) Six months alone in a cave

Siffre, M. (1975). *Six months alone in a cave*. *National Geographic Magazine*. 1975; 147: 426–445.

<http://www.cabinetmagazine.org/issues/30/foer.php>

Resources for development

Sources suggested here are additional guidance for centres to aid with teaching resources and ideas. These are not compulsory components and centres should select delivery content as appropriate to their candidates. Centres can draw upon any research evidence to support evaluations and explanations of topic areas. This list is not exhaustive.

Sleep and dreaming

https://www.macalester.edu/academics/psychology/whathap/UBNRP/Website_REM_Sleep/index.html

<http://www.sleepdex.org/>

http://www.psychteacher.co.uk/biologicalrhythms/circadian_rhythms.html

<http://www.slideserve.com/hal/sleep-and-sleep-disorders>

<https://sophpsych.wordpress.com/2012/03/25/the-role-of-endogenous-pacemakers-and-exogenous-zeitgebers-in-biological-rhythms/>

<https://www.freud.org.uk/education/topic/10576/subtopic/40022/>

Allan, H.J. and Robert, M. (1997) The brain as a dream state generator: an activation-synthesis hypothesis of the dream process. *Am J Psychiatr*; 134: 1335–1348.

<https://pdfs.semanticscholar.org/f1af/886bfac2ee058ddaf1a6fb61dabe08e19b08.pdf>

Sleep disorders

<http://www.nhs.uk/conditions/Insomnia/Pages/Introduction.aspx>

<http://www.nhs.uk/Conditions/narcolepsy/Pages/Introduction.aspx>

GCSE Psychology

<https://sleepfoundation.org/>

<https://psychcentral.com/disorders/sleep/>

Teacher resource sharing

Further suggested resources can be found in the 'Getting Started' publication, where a scheme of work has been provided.

<http://www.psychotron.org.uk>

<http://www.psychteacher.co.uk>

<http://www.resourcd.com>

Teacher and student resource sites

<http://www.simplypsychology.org/> – this website gives an overview of many of the key areas.

<https://www.psychologytoday.com/> – this is an online magazine (with an option to subscribe) that brings psychological theories into modern, contemporary issues.

<https://play.google.com/store/search?q=psychology%20free%20books&c=books&hl=en> – this site has a number of free short books about key areas of psychology.

<http://www.open.edu/openlearn/body-mind/psychology> – the 'OpenLearn' programme offers freely accessible resources provided by the Open University.

<http://allpsych.com/> – a useful site with books, articles and summaries of some of the key concepts.

<https://www.youtube.com/playlist?list=PL8dPuuaLjXtOPRKzVLY0jJY-uHOH9KVU6> – Psychology 'Crash Course' is a YouTube channel that provides 40 short overviews of psychological issues.

<http://www.bbc.co.uk/programmes/b008cy1j> – 'BBC Mind Changers' is a series of radio episodes (that can also be downloaded) about key psychologists, their work, and the development of psychology over time.

<http://www.bbc.co.uk/programmes/b006qxx9> – 'BBC In the Mind' is a series of radio episodes that focus on the human mind using the application of psychological concepts and theories.

**All weblinks included here have been checked as active at publication, however the nature of online resources is that they can be removed or replaced by webhosting services and so it cannot be guaranteed that these sites will remain available throughout the life of the qualification.*