OpenStax Psychology
Chapter 4 States of Consciousness
Study Guide

4.1 What Is Consciousness?

Consciousness is the basic awareness of both internal and external stimuli. Internal awareness can range from feelings of hunger or pain to even thoughts and emotions. External stimuli are generally more physical and include detection of light, the feeling of temperature, or even listening during a conversation.

As humans, we experience various states of consciousness and our levels of awareness differ in many case. From being fully awake to a state of deep sleep, our levels of awareness are continuously changing.

- **Sleep**, for instance, is a state marked by relatively low physical activity as well as a reduced sense of awareness.
- **Wakefulness** encompasses relatively higher levels of sensory awareness, thought activity, and behavior. To demonstrate these differences, you can imagine times of being sleepy in comparison to being fully alert and awake. What sorts of thought or behavior patterns differ between these states? Perhaps you demonstrate a more wakeful state in the early afternoon versus early in the morning.

- These states are delegated through internal rhythms of biology activity also known as **biological rhythms**.
- Biological rhythms encompass all cyclical patterns of bodily change ranging from fluctuation of body temperature to an individual's menstrual cycle. Keep in mind levels of alertness can also be associated with these bodily fluctuations.
- All these fluctuations take place every day for a period of about 24 hours and are a prime example of our **circadian rhythm**, the biological rhythm that cycles every 24 hours.

Throughout these changes, **homeostasis**, or the tendency towards equilibrium within our biological system, is maintained. A sense of time is maintained I the part of the hypothalamus known as the **suprachiasmatic nucleus** and acts as a clock of a sorts within the brain. Despite continued maintaining of equilibrium between states; various instances, like sleep deprivation, can throw off our circadian rhythms.

- To maintain any irregularities, an endocrine structure known as the **pineal gland** releases a hormone known as **melatonin** to regulate our sleep-wake cycles.

Questions:

1. How does the chapter describe consciousness
    a. What is the difference between internal and external stimuli?
    b. Compare and contrast sleep and wakefulness states
2. What are biological rhythms and what are some examples?
3. Homeostasis is a concept presented in chapter 3.
    a. what does it mean?
    b. Where in the brain is it located?
4. Where in the brain is our biological clock and what is it called?
5. Explain what type of hormone is melatonin and which brain structure releases it.
    c. How is melatonin related to homeostasis?
    d. How does sleep regulation affect people who called themselves "night owls"? what about morning people?
6. Disruptions of Normal Sleep:
    e. What is jetlag and when does it happen?
    f. What are some examples of jobs that required a rotating shift work?
        i. What are the effects of having a rotating shift work and how can they be ameliorated?
    g. What happens when people suffer from insufficient sleep?
    h. What are the effects of sleep deprivation?

4.2 Sleep and Why We Sleep

Sleep is a state marked by relatively low physical activity and a reduced sense of awareness.

Sleep-wake cycles seem to be controlled by multiple brain areas including the thalamus and hypothalamus (slow-wave sleep) and the pons (REM sleep).

Sleep is associated with the secretion and regulation of many hormones including:

- Melatonin
- Follicle stimulating hormone
- Luteinizing hormone
- Growth hormone.

<u>Adaptive Function (Evolutionary Hypotheses)</u>

- Sleep is essential to restore resources that are expended during the day.
- Sleep is an adaptive response to predatory risks, which increase in darkness.

There is little evidence to support these explanations.

<u>Cognitive Function</u>

Focuses on sleeps importance for cognitive function and memory formation.

- Research shows that sleep deprivation results in disruptions in cognition and memory deficits.
- These impairments become more severe as the amount of sleep deprivation increases.
- Slow-wave sleep appears to be essential for effective memory formation.

<u>Benefits of sleep</u>

Maintaining a healthy weight, lowering stress levels, improving mood, increased motor coordination as well as many benefits related to cognition and memory formation.

Questions:

1. When does sleep rebound happen?

2. What are the different hormones secreted during sleep?
3. How is the secretion of different hormones during sleep related to normal daily functioning?
4. According to evolutionary theories, what are the adaptive functions of sleep?
5. How does the theory of cognitive function explain why we sleep?

4.3 Stages of Sleep

Sleep itself is not present in a single state; rather it is composed of 5 stages divided by differentiating brain wave activity. Entirely, sleep can be divided into two general phases:

rapid eye movement (**REM**) and **non-REM** (**NREM**).

- REM can be characterized by actual rapid eye movements under closed eyelids as well as similar brain wave activity to that of being awake.
- In contrast, non-REM sleep is makes up the majority of the sleep stages and can be categorized into 4 stages, each with differentiating intensity of brain wave activity.

Questions:

Is sleep a uniform state of being? If not, what are the different stages involved in sleep?

1. Why do you think we go through different stages of sleep?
2. What happens during each stage of sleep? What characteristics are involved in each?
3. How do we know of the different stages of sleep? That is, what tool is used to measure them?

REM SLEEP

4. What does REM stand for? What happens during REM?
5. What is REM rebound?

Dreams

6. How did Sigmund Freud interpret dreams?
7. According to Freud, what are the two types of dream content?
8. According to Carl Jung, what is the collective unconscious?
9. How does the dreaming researcher Rosalind Cartwright counter attack the views of Freud and Jung on dreams?
10. What about Alan Hobson's activation-synthesis theory of dreaming? How does it explain dreams?
11. Which of those dream explanations are you more inclined to believe and why?