

Theories on stages of sleep



**ASSIGN
BUSTER**

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In our textbook it says that, “ REM sleep makes up the remaining 20 per cent of your sleep time. It is pronounced “ rem” and stands for rapid eye movement sleep because your eyes move rapidly back and forth behind closed lids” (Plotnik & Kouyoumdjian, 2014, p. 153). The brain waves that are present in REM sleep are beta waves, which is the same kind that are present when a person is awake. Also, during this stage, the body is alert, but the muscles are paralyzed, thus prohibiting movement during this time. The REM sleep stage is the one that the process of having dreams occurs in. According to our text, a person passes through the REM sleep stage about five or six times a night. The intervals in between these stages are approximately half an hour to an hour and a half long. Most people are in the REM sleep stage for about half an hour to forty-five minutes, before they enter the NREM, or Non REM, sleep stage. An individual’s heart rate and blood pressure are typically higher in REM, indicating a more alert state in this stage than in the non REM stage. Creative thinking processes are more present during REM sleep, probably due to a lack of activity in the areas of the brain that are responsible for critical thinking. Students need REM sleep in order to transfer the knowledge that they have stored throughout the day in short term memory, into long term memory. This stage helps to promote the encoding process, which is responsible for the transfer. Once the information is encoded during the REM stage, it becomes easier to recall at a later time for tests and exams. There is an indication in the human body of the need for REM sleep, because if someone has not spent enough time in

this stage the previous night, the body will compensate by spending more time in REM the following night.

The Alpha stage occurs right before people drift off to sleep. During this stage, people start to feel tired and relaxed, often just lying in bed with their eyes closed, and random thoughts, such as activities of the previous day, or the plans that they may have the following day, present in their thoughts. According to the text book, “ Alpha waves have a low amplitude and high frequency, (8 to 12 cycles per second)” (Plotnik & Kouyoumdjian, 2014, p. 152). After the alpha stage, Non REM Sleep, or NREM for short, occurs. This stage is where most people spend 80 per cent of their time while sleeping. This type of sleep is divided into four stages, each stage being associated with unique brain wave patterns and biological responses (Plotnik & Kouyoumdjian, 2014). In the first stage of Non REM sleep, there is a transition that occurs from being wide awake and alert, to drifting off to sleep. This stage usually lasts from about one to seven minutes long. The text says that this stage is “ marked by the presence of theta waves, which are lower in amplitude and lower in frequency (4 to 7 cycles per second) than alpha waves” (Plotnik & Kouyoumdjian, 2014, p. 152). Next, the person passes through the second stage of sleep.

In the second stage, there are rapidly occurring periods of what researchers call sleep spindles. In this stage, physiological processes such as breathing, a person’s body temperature, and their heart rate slowly decrease, and they become harder to wake up. This stage is what most researchers define as a person being asleep. Next, after about half an hour to forty five minutes of falling asleep, the individual enters stages three and four of Non REM sleep.

Delta waves are present in stage three, and these are defined as “ large, slow brain waves, meaning they have very high amplitude and very low frequency” (Plotnik & Kouyoumdjian, 2014, p. 152). As the person moves on to stage four in Non REM sleep, they experience a significant increase in the presence of Delta waves. During this stage, biological processes such as heart rate, breathing, body temperature, and the flow of blood to the brain are dramatically decreased, and the body secretes a substance called GH, or growth hormone, which is responsible for controlling the metabolic rate in the body, physical growth in the body, and the development of the human brain. After this stage, the individual passes back through the second and third stages of Non REM, and enters into the dreaming, or REM, stage of sleep.

The necessity of sleep for a living organism can be explained in two logical ways. The first is that the body repairs and restores itself while it is resting. In one theory, the human brain repairs and restores itself while sleeping. It has also been proven that chemicals that are harmful to our system are flushed out during the sleeping process. Some research has also suggested that the immune system is impaired because of sleep deprivation (National Institute of Neurological Disorders and Stroke, 2013). The second way that it can be explained is the Conservation theory. This theory suggests that the need to conserve energy at night for the human race promoted the need for sleep. In other words, since it was dark out, and there was little light to be able to see, that time was better spent resting instead of moving about. It would seem that as an individual goes throughout their lifetime, the need for sleep is greatest during the early years, and less as they get older.

When an infant is born, the average time that they spend asleep is about seventeen hours a day, with half of that time spent in REM sleep. Then, when they get a little older, such as approximately around four years old, they sleep about ten hours a day, with about 25 to 30 per cent of that time spent in REM sleep. A little later, around the teenage years, the amount of sleep that is required is about 9 hours per night, with the trend being later bed times, and the teenagers waking up later during the day. A couple years later, at about nineteen to twenty years of age, the amount of sleep required by the adolescents is about seven to eight hours per night, with twenty per cent of that time spent in REM. As an adult reaches the golden years, the amount of sleep required is six and a half hours per night, with approximately twenty per cent being spent in REM sleep.

The text defines the circadian rhythm as a “ biological clock that is genetically programmed to regulate physiological responses within a time period of twenty-four hours (Plotnik & Kouyoumdjian, 2014, p. 150). The circadian clock is genetically set for about 24 hours 18 minutes. The clock is reset by the retinal cells, which act like sensors that let in sunlight, and send signals to the brain, resetting it by eighteen minutes each day. However, there are quite a few problems associated with the circadian clock by individuals who work midnight shifts or have to fly frequently for their job, thereby getting a condition known as jet lag. First, let’s discuss individuals that work the midnight shift. These individuals go against the natural instinct of their circadian clocks, resulting in decreased performance of their cognitive and motor skills. Also, people who change shifts a lot, such as working swing shift, cause a lot of physical stress in their bodies and

psychological stress in their minds. Secondly, people with jet lag often experience problems with feeling tired all the time, difficulty in being able to concentrate on a particular task, and reduced ability in their ability to use logical thinking, reasoning, or remembering. It takes people with jet lag about a day per hour of difference between time zones to recover. However, there is hope. Charles Czeisler developed a new treatment called light therapy in 1994. This treatment uses artificial light to combat fatigue in both people who work the midnight shift, and those with jet lag. Next I would like to talk about the effects that sleep deprivation has on individuals.

People with sleep deprivation run the risk of having impaired immune systems, with the potential for increased infections and diseases. They also experience increased stress levels, elevated blood pressure, and an increased build-up of plaque in the arteries, with a severe potential for heart attack or stroke. Other problems they experience include the risk of obesity and diabetes, difficulty in recognizing words, and doing ordinary math problems. They are more susceptible to increased irritability, and increased difficulty in making logical and rational decisions.

Terms and Concepts

1. Perceptual Threshold -The perceptual threshold is the smallest thing that can be perceived, or recognized, by the human senses.
2. Sensation – A sensation is a relatively meaningless piece of information, that results when the brain processes electrical signals that come from the sense organs.

3. Stimulus – A stimulus is any change of energy in the environment, such as light waves, sound waves, mechanical pressure, or chemicals.
4. Structuralists – Structuralists are psychologists who believed that we add together thousands of sensations to form a perception.
5. Gestalt Psychologists – Gestalt psychologists are psychologists that believe that our brains follow general rules that specify how individual elements are to be organized into a meaningful pattern, or perception.
6. Depth Perception – Depth Perception is the ability of the eye and brain to add a third dimension called depth to all visual perceptions, even though the images being projected might only be two dimensional in nature.
7. Consciousness – Consciousness describes different levels of awareness of one's thoughts and feelings.
8. Biological Clock – The biological clock is an internal timing device that is genetically set to regulate various physiological responses for different periods of time.
9. Stages of Sleep – Stages of sleep refer to the distinctive changes in the electrical activity of the brain, and accompanying physiological responses to the body that occur as someone passes through different phases of sleep.
10. Hypnosis – Hypnosis is a procedure in which a researcher, clinician, or hypnotist suggests that a person will experience changes in sensations, perceptions, thoughts, feelings, or behaviors.
11. Stimulants – Stimulants are chemical substances such as cocaine, amphetamines, caffeine, and nicotine that increase activity of

the central nervous system and result in heightened alertness, arousal, euphoria, and decreased appetite.

12. Opiates – Opiates are chemical substances such as opium, morphine, and heroin that produce three predominant effects in the central nervous system: the reduction of pain, opiate euphoria, a pleasurable state between waking and sleeping; and constipation.
13. Hallucinogens – Hallucinogens are drugs that affect someone's mind or behavior and have the ability to produce changes in perception, thought, emotion, and awareness.
14. Classical Conditioning – Classical Conditioning is a kind of learning in which a neutral stimulus acquires the ability to produce a response that was originally produced by a different stimulus.
15. Operant Conditioning – Operant Conditioning is a kind of learning in which the consequences that follow some behavior increase or decrease the likelihood of that behavior's occurrence in the future.
16. Cognitive Learning – Cognitive Learning is a kind of learning that involves mental processes, such as attention and memory, may be learned through observation or imitation; and may not involve any external rewards or require the person to perform any observable behaviors.
17. Generalization – Generalization is the tendency for a stimulus that is similar to the original conditioned stimulus to elicit a response that is similar to the conditioned response.
18. Discrimination – Discrimination occurs when an organism learns to make a particular response to some stimuli but not to others.

19. Extinction – Extinction is a procedure in which a conditioned stimulus is repeatedly presented without the unconditioned stimulus, and, as a result, the conditioned stimulus no longer elicits the conditioned response
20. Thorndike – Thorndike was an American psychologist who lived during the 1800's and formulated the law of effect, which stated that if some random actions are followed by a pleasurable consequence, such actions are strengthened and will likely occur in the future.
21. Skinner – Skinner was a psychologist who developed a theory known as the operant response during the 1930's, which says that “ An operant response is a response that can be modified by its consequences and is a meaningful unit of ongoing behavior that can be easily measured” (Plotnik & Kouyoumdjian, 2014, p. 214).
22. Reinforcers – Reinforcers are “ consequences that occur after a desired behavior and increase the chances that the behavior will occur again” (Plotnik & Kouyoumdjian, 2014, p. 218).
23. Punishment – A punishment is a stimulus that “ stops or decreases the occurrence of a behavior” (Plotnik & Kouyoumdjian, 2014, p. 219).
24. Schedules of Reinforcement – Schedules of Reinforcement are programs or rules that determine how and when the occurrence of a response will be followed by a reinforcer (Plotnik & Kouyoumdjian, 2014, p. 220).
25. Spontaneous Recovery – Spontaneous Recovery refers to either a temporary recovery in the rate of responding in operant conditioning, or the temporary occurrence of the conditioned response in the

presence of the conditioned stimulus in classical conditioning (Plotnik & Kouyoumdjian, 2014, p. 222).

26. Behavior Modification “ is a treatment or therapy that changes or modifies problems or undesirable behaviors by using principles of learning based on operant conditioning, classical conditioning, and social cognitive learning” (Plotnik & Kouyoumdjian, 2014, p. 232).

References

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