

# [Dreaming and the brain research paper](https://assignbuster.com/dreaming-and-the-brain-research-paper/)

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Scientists have for many years tried to determine exactly what causes dreaming, and the activities that occur in the brain during dreaming. However, the neurological, physiological and psychological functioning of the brain act in combination to determine what and how one will dream. Scientists believe that arousal and stimulation of the cortex and brain stem play a role in activating the central nervous system such that some impulses felt during the dream feel absolutely real.
Some scientists believed that dreaming was initiated by rapid eye movement (REM) prior to sleeping. They proposed that dreaming depended on the stages of sleeping. The process is significantly influenced by cognitive processes that occur during sleeping. Other psychological states of sleeping include wakefulness and non-REM (NREM). Each state has its own mental activities that occur as one sleeps. The process of dreaming entails activation, input and modulation (AIM). According to scientists such as Antrobus, REM comprises of a lot of mental activity resulting in dreamlike occurrences. This is especially because this phase is associated with increased activity of the cortex and inhibition of most of the sensory activities. On the other hand, during NREM the cortex is less active and hence the mental activity is described by scientists as similar to natural thoughts (Antrobus, 126).
Another theory that tries to explain dreaming and the brain activity is the Freudian theory. According to this theory REM still plays a central role in dreaming. REM is that state of intense sleep associated with a high state of arousal of the cortex, and hence the brain. REM is a cyclical occurrence that is experienced every 90 minutes when one is asleep. Research by scientists revealed that persons awakened during this stage of sleeping remembered or recalled the detailed contents of dream. This means that this stage is the only one that scientists can use to generate reports on the physiology of dreaming (Hobson, 478). According to these scientists, the activation of REM is analogous to switching on and off of any device such as a bulb.
This mechanism is oscillatory in nature and is controlled from the lower part of the brainstem. Under normal conditions of consciousness, this part of the brain has very few roles to play. Therefore, it is mainly responsible for making sure an individual according to the physiological needs of the brain. The weakness with Freud’s theory was that it disregarded the fact that some dreaming activity does occur during NREM. Furthermore, he based his argument claiming that dreaming depended on inner wishes of an individual. This was refuted since some dreams (such as nightmares) are anything, but wishful.
Another theory was forwarded by Foulkes. He concentrated more on the role of cognitive processes on the mechanism of dreaming. According to this theory, dreaming comprised of three main stages: activation of mnemonics, planning of various mnemonics and organization of various components of these mnemonics into a dream. The activation of the various mnemonics is an occurrence that involves planning such that there is selective processing of those mnemonics sources available. This means that the physical and psychological occurrences in one’s life will be incorporated into the content of the dreams. However, this theory did not substantially elaborate the role of mental physiology in the process of dreaming.
Other scientists used this theory as a basis to incorporate the role of brain activity in dreaming. According to these scientists, mnemonics are stored in the memory. This means they are store in four subsystems of the brain, each with a different role. These subsystems include: the semantic system, perpetual representation, procedural and episodic system. The four systems work closely together, and in such a manner that the output in one system can be the input in another. The experience that is created during the dream is dependent on the existing memory. This means that a mental screen is created during the process of dreaming. The pictures or imagers that comprise the dream are fetched from any of the four subsystems that store the mnemonics. During the process of dreaming all mental mechanisms associated with self judgment and regulation are completely disabled such that all occurrences are of a subconscious nature. Only the functions associated with primary consciousness remain effective as one dreams.
Some scientists were able to observe major hallucinations occur during that period of deep sleep (delta sleep). It is at this stage an individual is most likely to experience sleep walking and other hallucinations. However, this stage is distinguishable from REM which is the stage most associated with dreaming. Prior to REM, the brain sends impulses to skeletal muscles such that they become paralyzed to allow for little movement. Most scientists support the theory associated with REM since some experiments have proven that during this stage cortex activity is very high (as if one is in an awakened state). This means that the mind is able to process mental pictures and images during this phase of sleeping.
Scientists have used electro-polygraphs to conclude that most of the dreaming occurs during the REM. This is because these procedures revealed increased brain activity, especially the cortex during this phase. More specifically, scientists attest de-synchronization of the cortex to increased activity in the cortex. This means the brain is processing many images at this time, just like it does when one is awake. Similarly, scientists found synchronization of the cortex during the NREM phase meaning that there is hypo-activation of the cortex during this phase due to little processing of images (Schott, 475).
All research work focusing on CNS activity makes numerous comparisons between the state of the brain in the REM and NREM state. During dreaming, there is a reduction in metabolic activity in the basal forebrain, thalamus and hypothalamus, among other sub-cortical parts of the brain. More specifically, the decrease in metabolism is observed in the anterior cingulated cortex and the right temporal medial lobe. Studies also indicated increased blood flow to the cortex (both the primary and secondary visual cortex). This shows that this part of the brain is actively involved in the process of dreaming.
Under conditions of REM there is increased blood flow to the amygdale, the dorsal mesencephalon and right parietal operculum. The temporal occipital medial is activated during REM and is primarily responsible for processing of images. Any planning of the dreams from mnemonics is done by the inferior parietal that is responsible for processing of spatial features that will be included in the dream. The parts of the brain help in creation of a scenery and organization of various contents of the dream.

## Work Cited

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