

Why do we dream?



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The proposed question of ' why do we dream?' is one that can be easily asked but harder to explain. At this moment in time, there is a certain degree of ignorance to sleep and dreams based on the fact that we are yet to know the function of dreaming. Despite there being several theories about the concept of dreaming, there has yet to be a significant understanding about the purpose of sleep or the function of rapid eye movement (REM) sleep. Recent theories and views on dreaming have given us the impression that in cognitive neuroscience, dreaming does not serve any biological function. REM sleep and the neurophysiologic events that dreaming tends to be associated with are biologically functional as they support functions in developing the brain and helping to restore the brain's neurochemical balance.

There is an extensive argument by a selection of scientists that sleep and REM sleep contain biological functions, yet dreaming has no scientific function. They believe that dreaming is an epiphenomenon that is the mental activity which occurs during REM sleep. However, the high correlation between REM sleep and dream recalls has led to 5 common beliefs about dreaming that required a necessary requirement to be tested. Many people believed the assumption that external stimuli are incorporated into their dreams. Sleeping subjects were sprayed with water (Pement & Wolpert, 1958) after they had been in REM sleep for a few minutes. The participants were then woken after they had been sprayed with water. It was found that in 14 out of 33 cases, the water was incorporated into the dream report.

It was also found that some people believe that dreams last an instant, whereas other research suggests that dreams actually rely on 'real time'. Dement and Kleitman (1957) made sure that participants were awakened either 5 or 15 minutes after the beginning of an REM episode and were then asked to decide on the basis of the events in their dream, whether they had been dreaming for 5 or 15 minutes. It was found that 92 out of 111 cases were proven to be correct. There is another claim that people do not dream, despite having as much REM sleep as normal dreamers. Goodenough et al (1959) found that they report dreams if they are awakened during REM episodes, but less frequently than normal dreamers. Also, penile erections were commonly associated with dreams containing sexual content. However, Karacan et al (1966) found that there was no correlation between erections and the sexual content of dreams. Even babies have REM related penile erections. When a person sleepwalks it usually occurs during stage 3 or 4 sleep and it never occurs during dreaming when the core muscles are relaxed. REM sleep doesn't have a significant relationship with sleep talking as it can occur during any stage but often occurs during a transition to wakefulness.

One of the main theories of dreams is the activation synthesis approach. Hobson & McCarley (1977) argue that during REM sleep, circuits start to become activated which allows the limbic system to be associated with emotions, sensations and memories. The brain synthesises the activity and tries to develop an understanding of the signals which then results in dreaming. This theory argues that the interpretation of signals generated by the brain during sleep gives us dreams. Hobson argues that this theory isn't

meaningless as the model suggests that we dream because of the signals that are internally generated.

The activation component of the activation synthesis theory relates to the regular switching on of REM sleep as part of the stages of sleep cycles. When the REM mechanism that is based in the brainstem is activated, it produces the paralysis of the REM sleep. The excited activity in the forebrain has passed through pathways that have ascended from the brainstem.

Activation, sensory and motor information becomes aroused as part of the forebrain which then helps develop our dream experience. The organisation of the sensory and motor perception is organised by the dream into a significant structure, as well as receiving a considerable input from the person's past expectations and experiences.

According to the activation - synthesis hypothesis, dreaming is part of the regular process of the brain's sleep mechanisms. However, this theory allows the integration of the sensory and motor information. An example of this is that when the neurons fire in the section of the brain that handles balance, the cortex would generate a dream about falling. Another example of this is that if the signals produce something that is related to running then the cortex would create a dream about being chased (Taavris and Wade 1995).

REM sleep is produced by the cells in the brainstem and is sensitive to the neurotransmitter acetylcholine. Hobson (1988) supports the activation synthesis theory as he found out that participants' REM sleep and dreaming both increased when they were infected with drugs that increased acetylcholine. Gillin et al (1985) found that REM sleep and dreaming

decreased when participants were infected with a drug that decreases the action of acetylcholine.

The activation synthesis model is significantly 'broader' than the reverse learning theory, as well as the fact that it was based on more detailed experimental work. The model also gives a highly reputed account of the REM sleep and dreaming that has been underlined by brain mechanisms. It's hard to validate the model due to the breadth of it. It is difficult to explain any type of dream because dreams are either creative or lack and sense of meaning, therefore having little predictive power.

A second main theory of dreaming is the reverse learning model proposed by Crick and Mitchison (1983) as they believe that the reverse learning model relates to the brain switching off during the dreaming process. This then allows all the unwanted material to be thrown away from the initial information that was gathered from the current day's events. The reverse learning model helps us dream in order to forget. The large amount of information that is received during the day makes the cortex unable to function without 'parasitic' thoughts starting to develop. The unwanted connections in the cortical networks during REM sleep are destroyed by the impulses that attack the cortex from the subcortical areas. The parasitic thoughts are represented by the content of the dreams as they are then erased from memory. The studies of spiny anteaters have shown evidence to help support the theory. They have no REM sleep despite have an enlarged frontal cortex. According to Crick and Mitchinson (1983), the use of the cortex is critical in order to store both adaptive and parasitic memories, where highly evolved animals are disposed of during REM sleep. A criticism

of the reverse learning theory is that dreams are often organised into clear stories. If dreams were only made of parasitic thoughts then there would be no need for the systematic organisation. Crick and Mitchison (1983) later made modifications to their theory so it could only be applied to dreams that had random imagery but no narrative (stories).

Crick and Mitchison's reverse learning theory (1983) is supported by the Hopfield net, a mathematic model that accounts for repetitive and bizarre dreams. Hopfield et al (1983) describes the neural net as when it starts to overload, parasitic associations link the memories or concept together and are the n likely to become inflated. Crick and Mitchison (1986) believed that condensation as Freud has first suggested is also part of their theory.

Despite Freud's view of 'latent content' of dreams is highly debatable, whereas the use of condensation of the 'manifest content' has been well supported by Foulkes (1985) as the neural net theory predicts that with condensation there is some common features with the objects or events.

Evans (1984) also supported the view of Crick and Mitchison (1983) that when we dream, we organise the information that has been processed over the day. During REM sleep there is some problem solving as if a particular dilemma has happened during the day, it is then worked on by the brain. During the dreaming process, connections are allowed between the current problems and past experiences. There is little evidence to support Evans' explanation of dreaming as Borbley (1986) talks of the chemist Kekule who was researching the structure of benzene. The dream was of a snake that had swallowed its own tail which had given him the solution of a continuous

ring. Despite showing some relevance, there is very little experimental evidence to support this.

Another approach on dreaming is that of Sigmund Freud (1955) who believed that his psychodynamic approach had a significant impact on the interpretation of dreams in relation to the ‘unconscious activities of the mind’. He argues that a dream is full of desires, especially sexually and aggressive urges from the unconscious. There are then two functions of sleep; to protect the sleeper and the ability to express the desires that have been repressed.

Freud also believes that dreams have a ‘manifest content’ where the dreamer reports what has happened and its then interpreted to find the ‘latent content’ which is highlighted from the repressed desires. ‘Dream work’ relates to the desires and anxieties being transferred to the symbolism of the dream. Condensation, displacement and considerations of representability are a few mechanisms that are involved. Condensation is the way a dream represents several hidden anxieties and thoughts. There can be several different meanings if a particular person is in the dream. For example, relationships with certain family members, problems with school/work. The second mechanism, displacement, is where Freud believes that the emotion is attached to a hidden thought and is then replaced onto the dream image. Representability looks at the hidden thoughts that are transferred into a visual context so a dream that is about meaning may represent the fear of sexual urges.

Freud argues that dream work helps to prevent the dreamer being aware of the hidden thoughts, whereas the analyst has the role of interpreting the imagery and reversing the condensation, displacement and representability which then allows for the latent meaning of the dream to be revealed. Freud developed a series of dream symbols relating to cultural symbols such as stories, mythology, jokes etc. For example, a dream about flying would represent sexual intercourse. He also believed that dream imagery was usually represented in the previous days' events which can help disguise the latent content. However, Freud also commented on the fact that dream imagery does not represent anything i. e. a cigar can simply just represent a cigar and nothing else.

Despite Freud's theory being a popular part of scientific psychology, research has found that patients with brain damage in the forebrain have shown that our unconscious desires are neglected in the dream content. Freud strongly argues the point that dream and dream content are hugely significant in their own frame of mind. Dreams contain a mixture of current events and emotions from the day experiences that is then combined with material from the unconscious mind.

The consensus of psychological theories has originated from Freud's perception of dreams that have mainly represented sexually repressed material. Modern approaches such as computer metaphors are often used, where dreams are seen as processing the information that had been received during the day. The activation synthesis model offers the most detailed explanation in which dreams have no symbolic representation but are vital as part of sleep mechanisms. Theories of dreams are heavily relied

on by subjective reports as it is difficult for it to be experimentally tested. Freud's use of dream analysis is still studied by modern psychoanalysts, although there is no significant interest in researching the 'latent dream'. Rycroft (1979) however, rejected Freud's entire theory on the function of dreaming. He believed that everyone has to be neurotic because dreams cannot be known as a neurotic symptom as everyone can dream. If everyone is labelled as being neurotic then it's incredibly difficult to make any difference between normality and neurons.