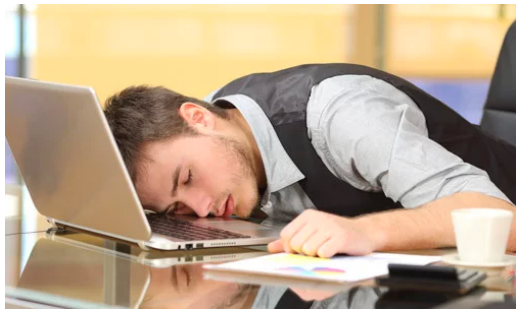
(mostly sleep and dreams)

Part 1/2



Report

Current Biology

Natural Sleep and Its Seasonal Variations in Three Pre-industrial Societies

Highlights

- Preindustrial societies in Tanzania, Namibia, and Bolivia show similar sleep parameters
- They do not sleep more than "modern" humans, with average durations of 5.7–7.1 hr
- They go to sleep several hours after sunset and typically awaken before sunrise
- Temperature appears to be a major regulator of human sleep duration and timing

Authors

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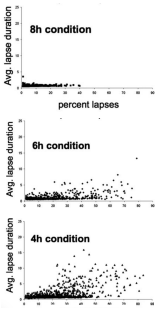
In Brief

Yetish et al. find that hunter-gatherers/horticulturalists sleep 6.4 hr/day, 1 hr more in winter than in summer. Onset is about 3.3 hr after sunset, and sleep occurs during the nightly period of falling temperature. Onset times are irregular, but offset time is very regular. Little napping is seen. Light exposure is maximal in the morning, not at noon.

When you don't sleep…

When you don't sleep…

Your attention gets worse



When you don't sleep…

Your driving gets worse

Research

Original Investigation

Sleep-Deprived Young Drivers and the Risk for Crash
The DRIVE Prospective Cohort Study

Alexandra L. C. Martiniuk, MSc, PhD; Teresa Senserrick, PhD; Serigne Lo, PhD; Ann Williamson, PhD; Wei Du, PhD; Ronald R. Grunstein, MD, PhD; Mark Woodward, PhD; Nick Glozier, MBBS, PhD; Mark Stevenson, PhD, MPH; Robyn Norton, PhD; Rebecca Q. Ivers, MPH, PhD

When you don't sleep…

you die

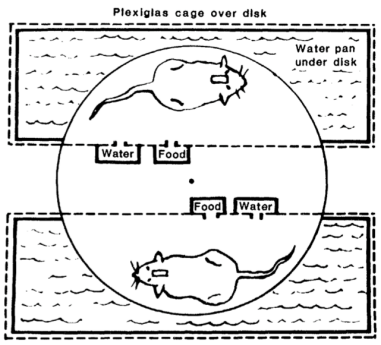
Physiological Correlates of Prolonged Sleep Deprivation in Rats

Abstract. *The issue of whether sleep is physiologically necessary has been unresolved because experiments that reported deleterious effects of sleep deprivation did not control for the stimuli used to prevent sleep. In this experiment, however, experimental and control rats received the same relatively mild physical stimuli, but stimulus presentations were timed to reduce sleep severely in experimental rats but not in controls. Experimental rats suffered severe pathology and death; control rats did not.*

If sleep serves an important physiological function, sleep deprivation should produce severe physiological impairment. Literature reviews (*1*) have emphasized the lack of such impairment, however. Older animal studies (*2*) that reported pathological changes or death following prolonged sleep deprivation have been either neglected or discounted for their failure to control for stimulus effects. When sleep is blocked by unrelenting, noxious stimulation, such as continuous enforced locomotion, it is unclear whether subsequent pathology is

tray containing water to a depth of 3 cm (Fig. 1). Whenever the disk was rotated, both rats had to walk in the direction opposite disk rotation to avoid being forced into the water.

Each rat's electroencephalogram (EEG), electromyogram (EMG), and theta activity were continuously recorded and later scored by computer for wakefulness (W), high-amplitude non-REM sleep (HS), low-amplitude non-REM sleep (LS), paradoxical sleep (PS), and total sleep (TS) (*4*). Upon recogniz-



Electroencephalography (EEG)

Awake and attentive

low amplitude, fast, irregular beta waves

Beta waves

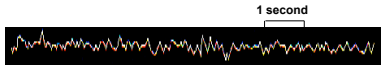
Awake but non-attentive

large, regular alpha waves

Alpha waves

Sleep stage #1

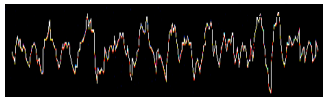
brief transition when first falling asleep



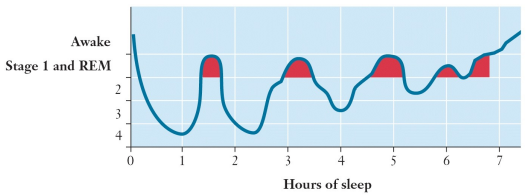
Theta waves

Sleep stages #2-4

"slow-wave" sleep



Delta waves



Study Links Ambien Use to Unconscious Food Forays

By STEPHANIE SAUL
Published: March 14, 2006

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THANK YOU FOR SMOKING

The sleeping pill Ambien seems to unlock a primitive desire to eat in some patients, according to emerging medical case studies that describe how the drug's users sometimes sleepwalk into their kitchens, claw through their refrigerators like animals and consume calories ranging into the thousands.


Illustration by The New York Times

The next morning, the night eaters remember nothing about their foraging. But they wake up to find telltale clues: mouthfuls of peanut butter, Tostitos in their beds, kitchen counters overflowing with flour, missing food, and even lighted ovens and stoves. Some are so embarrassed, they delay telling anyone, even as they gain weight.

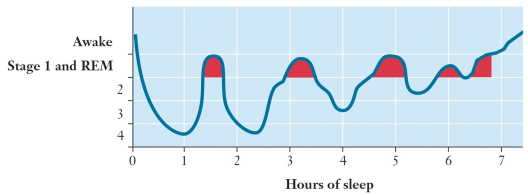
"These people are hell-bent to eat," said Dr. Mark Mahowald, who is director of the Minnesota Regional Sleep Disorders Center in Minneapolis and is researching the problem.

A "mystery" of psychology:

Nobody knows why we sleep

A "mystery" of psychology:

Nobody knows why we sleep

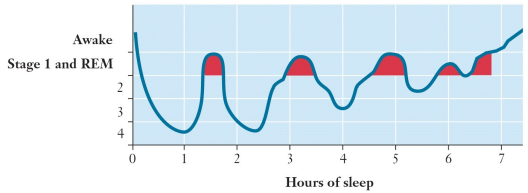


(mostly sleep and dreams)

Up next: Part 2/2

(mostly sleep and dreams)

Part 2/2



What do we dream about?

DreamBank
www.dreambank.net
Adam Schneider & G. William Domhoff
Psychology Dept., UC Santa Cruz

most dreams are bad

men have more aggressive dreams than women

people in tribal societies have more aggressive dreams than people in industrialized societies

Americans have more aggressive dreams than Europeans

DreamBank
www.dreambank.net
Adam Schneider & G. William Domhoff
Psychology Dept., UC Santa Cruz

What do we **want** to dream about?

Women: Romance and adventure

Men: Sex with strangers

~10% of dreams are actually sexual

DreamBank
www.dreambank.net
Adam Schneider & G. William Domhoff
Psychology Dept., UC Santa Cruz

What is the most common dream?

Being naked?

Flying?

Falling?

Why do we dream?

AKA: Rats dream of running mazes

Neuron, Vol. 29, 145–156, January, 2001, Copyright ©2001 by Cell Press

Temporally Structured Replay of Awake Hippocampal Ensemble Activity during Rapid Eye Movement Sleep

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Department of Brain and Cognitive Sciences
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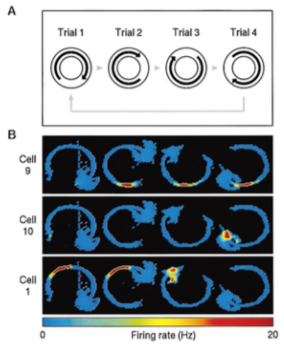
Cambridge, Massachusetts 02139

Summary

Human dreaming occurs during rapid eye movement (REM) sleep. To investigate the structure of neural activity during REM sleep, we simultaneously recorded the activity of multiple neurons in the rat hippocampus during both sleep and awake behavior. We show that temporally sequenced ensemble firing rate patterns reflecting tens of seconds to minutes of behavioral experience are reproduced during REM episodes at an equivalent timescale. Furthermore, within such REM episodes behavior-dependent modulation of the subcortically driven theta rhythm is also reproduced. These results demonstrate that long temporal sequences of patterned multineuronal activity suggestive of episodic memory traces are reactivated during REM sleep. Such reactivation may be important for memory processing and provides a basis for the electrophysiological examination of the content of dream states.

In contrast, the role of rapid eye movement (REM) sleep during memory consolidation is unclear. The strong association between human dreaming and REM sleep raises many questions about the information content of dream states as well as the physiological function of REM sleep. Deprivation studies demonstrate the necessity of REM sleep for the acquisition of certain types of learning (Smith, 1995), but it has been argued that REM sleep may serve a general homeostatic role rather than a specific memory-processing function (Crick and Mitchison, 1983). Although general experience-dependent changes in neural activity occur during REM sleep (Pavlides and Winson, 1989; Poe et al., 2000), efforts to detect short-timescale mnemonic activity like that observed during SWS have failed to detect such replay (Kudrimoti et al., 1999). However, unlike SWS, REM sleep is dominated by the robust theta oscillations (6–10 Hz) and EEG desynchrony that characterize the awake exploratory state, raising the possibility that reactivation during REM sleep may be temporally structured like awake neural activity.

To investigate this, we employed a behavioral task that produces distinct hippocampal firing patterns over extended durations and examined subsequent REM episodes for similar patterns of activity. Four male Long-Evans rats were chronically implanted with microelectrode arrays to record multiple single-cell activity from the CA1 region of the hippocampus (Wilson and McNaughton, 1993). Animals were trained to run along a



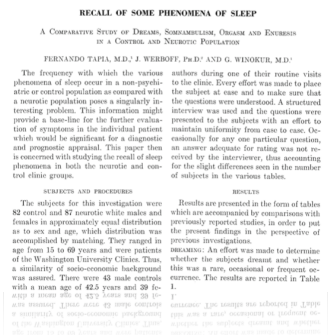
Do we really know the contents of our dreams?

Do you dream in color?

A. Yes

B. No

Tapia et al. (1953): **9%** of people report dreaming in color!



RECALL OF SOME PHENOMENA OF SLEEP

A Comparative Study of Dreams, Somnambulism, Orgasm and Enuresis in a Control and Neurotic Population

FERNANDO TAPIA, M.D.,[1] J. WERBOFF, PH.D.[2] AND G. WINOKUR, M.D.[3]

The frequency with which the various phenomena of sleep occur in a non-psychiatric or control population as compared with a neurotic population poses a singularly interesting problem. This information might provide a base-line for the further evaluation of symptoms in the individual patient which would be significant for a diagnostic and prognostic appraisal. This paper then is concerned with studying the recall of sleep phenomena in both the neurotic and control clinic groups.

SUBJECTS AND PROCEDURES

The subjects for this investigation were 82 control and 87 neurotic white males and females in approximately equal distribution as to sex and age, which distribution was accomplished by matching. They ranged in age from 15 to 69 years and were patients of the Washington University Clinics. Thus, a similarity of socio-economic background was assured. There were 43 male controls with a mean age of 42.5 years and 39 fe-

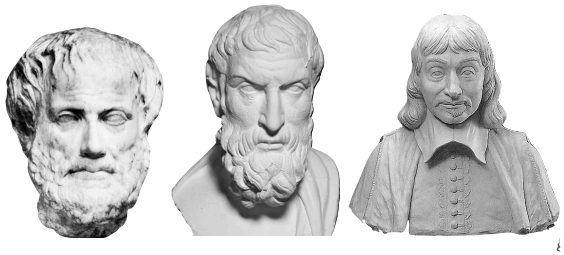
authors during one of their routine visits to the clinic. Every effort was made to place the subject at ease and to make sure that the questions were understood. A structured interview was used and the questions were presented to the subjects with an effort to maintain uniformity from case to case. Occasionally for any one particular question, an answer adequate for rating was not received by the interviewer, thus accounting for the slight differences seen in the number of subjects in the various tables.

RESULTS

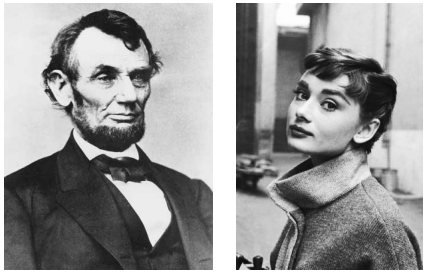
Results are presented in the form of tables which are accompanied by comparisons with previously reported studies, in order to put the present findings in the perspective of previous investigations.

DREAMING: An effort was made to determine whether the subjects dreamt and whether this was a rare, occasional or frequent occurrence. The results are reported in Table 1.

Dreams have color!



Aristotle Epicurus Descartes



Options

the color of dreams has changed over time

people were lying

we don't really know what our own dreams are like!

Dreams are still a mystery