Consciousness and the Two-Track Mind

Chapter 3

Consciousness and the Two-Track Mind

The Brain and Consciousness

- Cognitive Neuroscience
- Dual Processing

Try this….

1. Lift your right foot off the floor and make Clockwise Circles.

2. Now, while doing this, draw the number “6″ from top to bottom in the air with your Right Hand.

Sleep and Dreams

- Biological Rhythms and Sleep
- Why Do We Sleep?
- Sleep Disorders
- Dreams

Hypnosis

- Facts and Falsehoods
- Explaining the Hypnotized State

Drugs and Consciousness

- Dependence and Addiction
- Psychoactive Drugs
- Influences on Drug Use

Near-Death Experiences

Forms of Consciousness

Consciousness, modern psychologists believe, is an awareness of ourselves and our environment.


Bill Ling/ Digital Vision/ Getty Images


Christine Brune

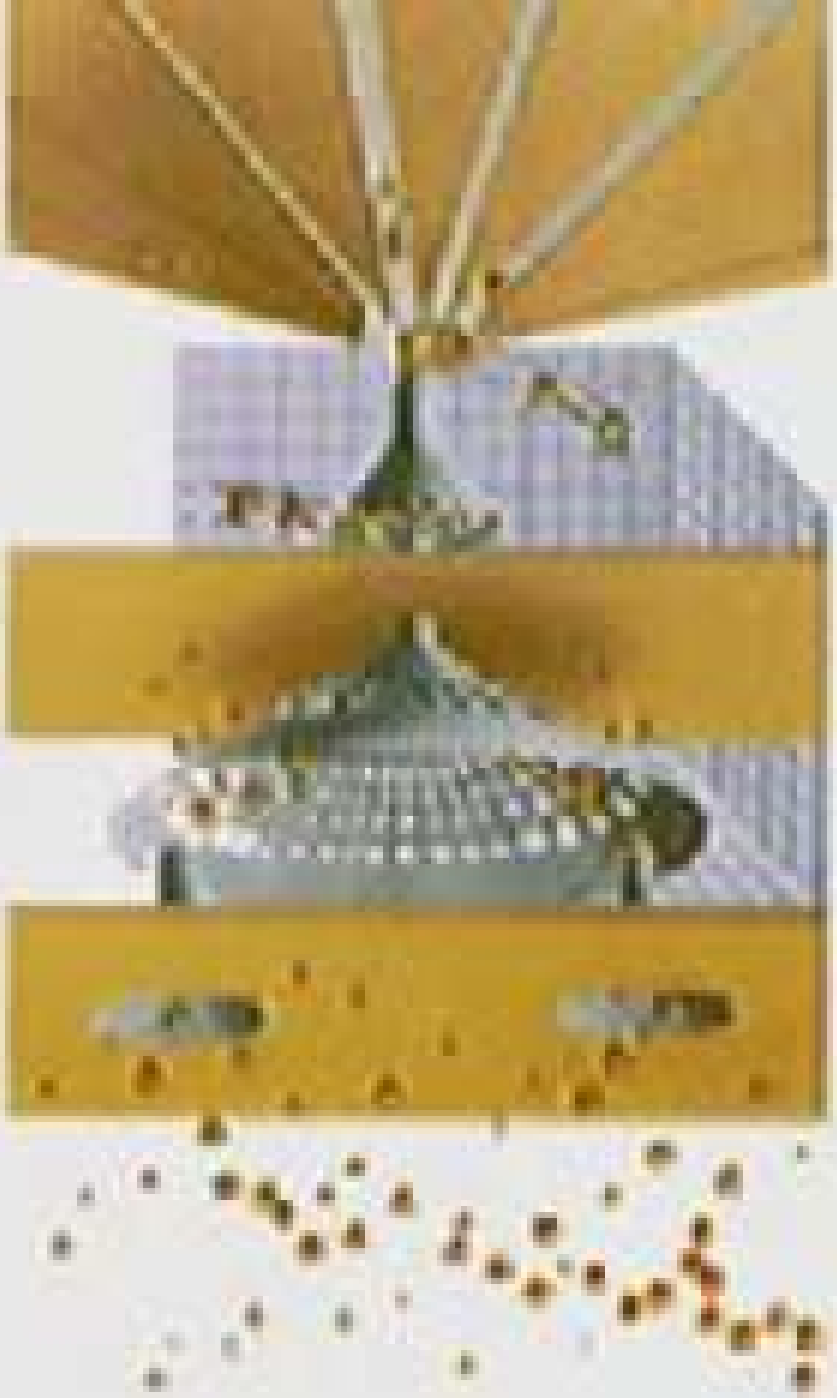

Stuart Franklin/ Magnum Photos


AP Photo/ Ricardo Mazalan

Some occur spontaneously	Daydreaming	Drowsiness	Dreaming
Some are physiologically induced	Hallucinations	Orgasm	Food or oxygen starvation
Some are psychologically induced	Sensory deprivation	Hypnosis	Meditation

Selective Attention

Our conscious awareness processes only a small part of all that we experience. We intuitively make use of the information we are not consciously aware of.



Inattentional Blindness

Inattentional blindness refers to the inability to see an object or a person in our midst. Simons & Chabris (1999) showed that half of the observers failed to see the gorilla-suited assistant in a ball passing game.

Daniel Simons, University of Illinois

Change Blindness

Change blindness is a form of inattentional blindness in which two-thirds of individuals giving directions failed to notice a change in the individual asking for directions.

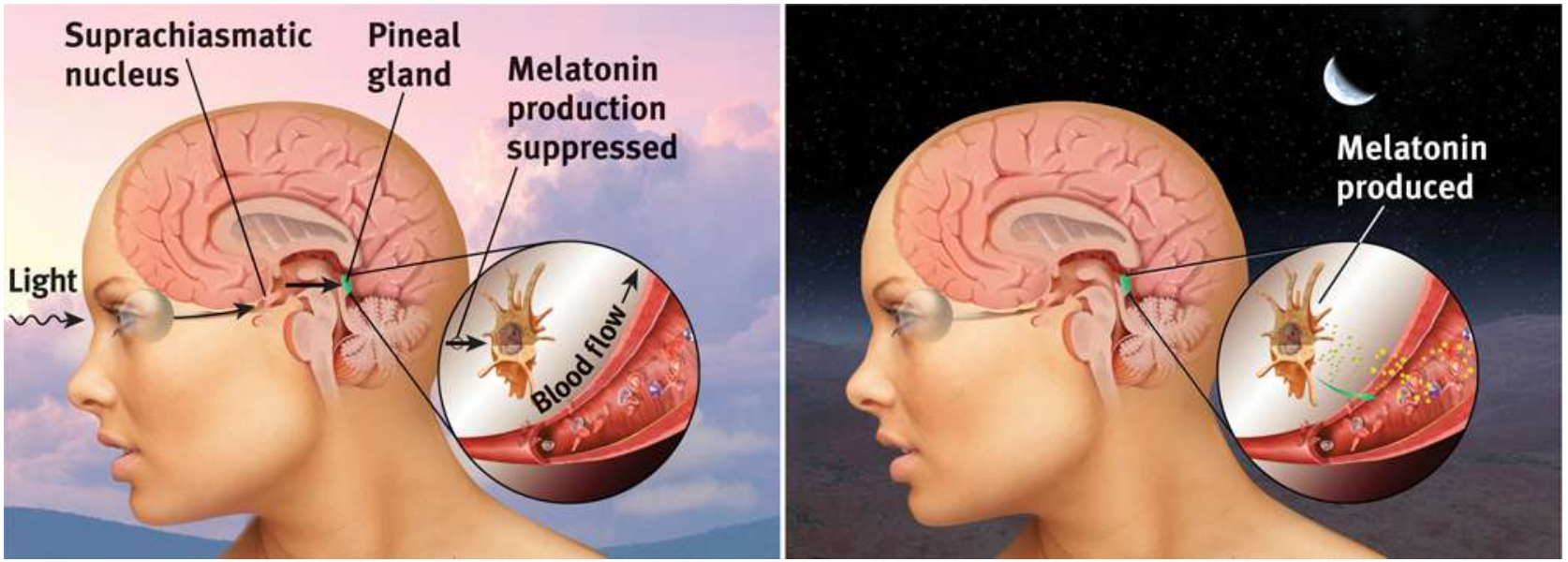
Sleep & Dreams

Sleep – the irresistible tempter to whom we inevitably succumb.

Mysteries about sleep and dreams have just started unraveling in sleep laboratories around the world.

Biological Rhythms and Sleep

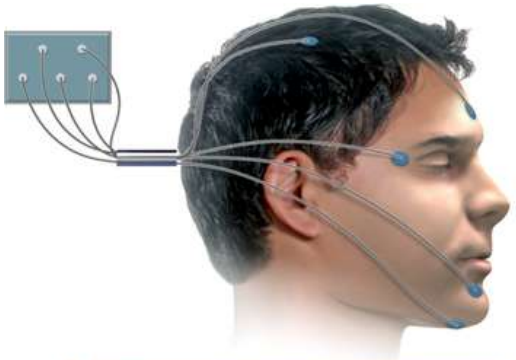
Circadian Rhythms occur on a 24-hour cycle and include sleep and wakefulness. Termed our "biological clock," it can be altered by artificial light.

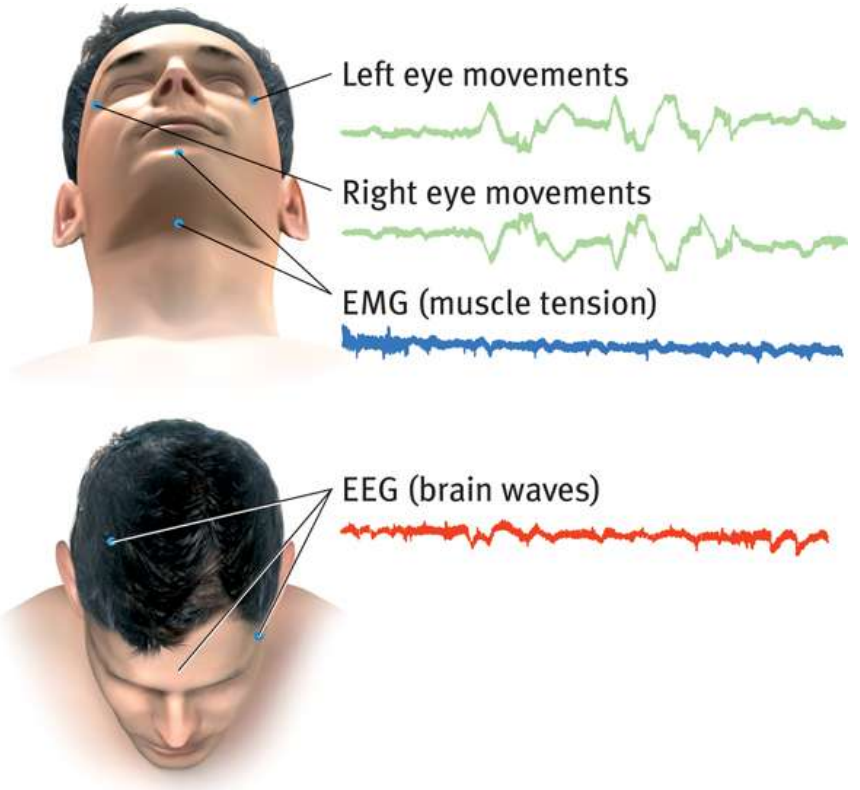


Light triggers the suprachiasmatic nucleus to decrease (morning) melatonin from the pineal gland and increase (evening) it at nightfall.

Sleep Stages

Measuring sleep: About every 90 minutes, we pass through a cycle of five distinct sleep stages.

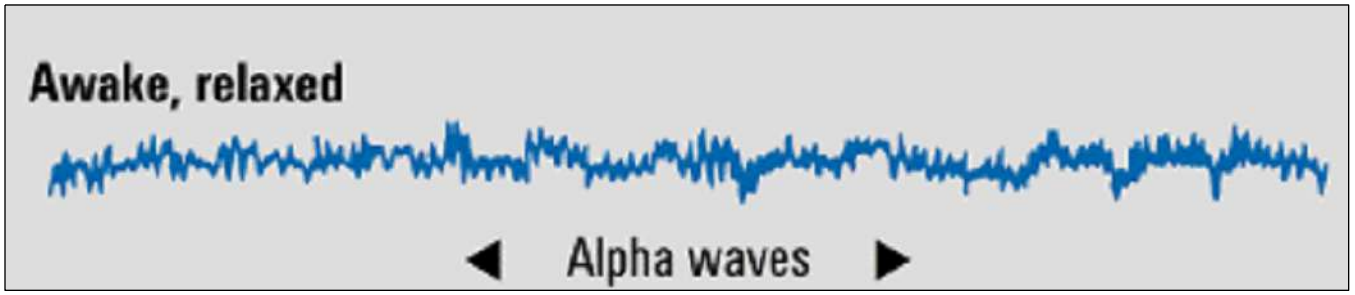




Hank Morgan/ Rainbow

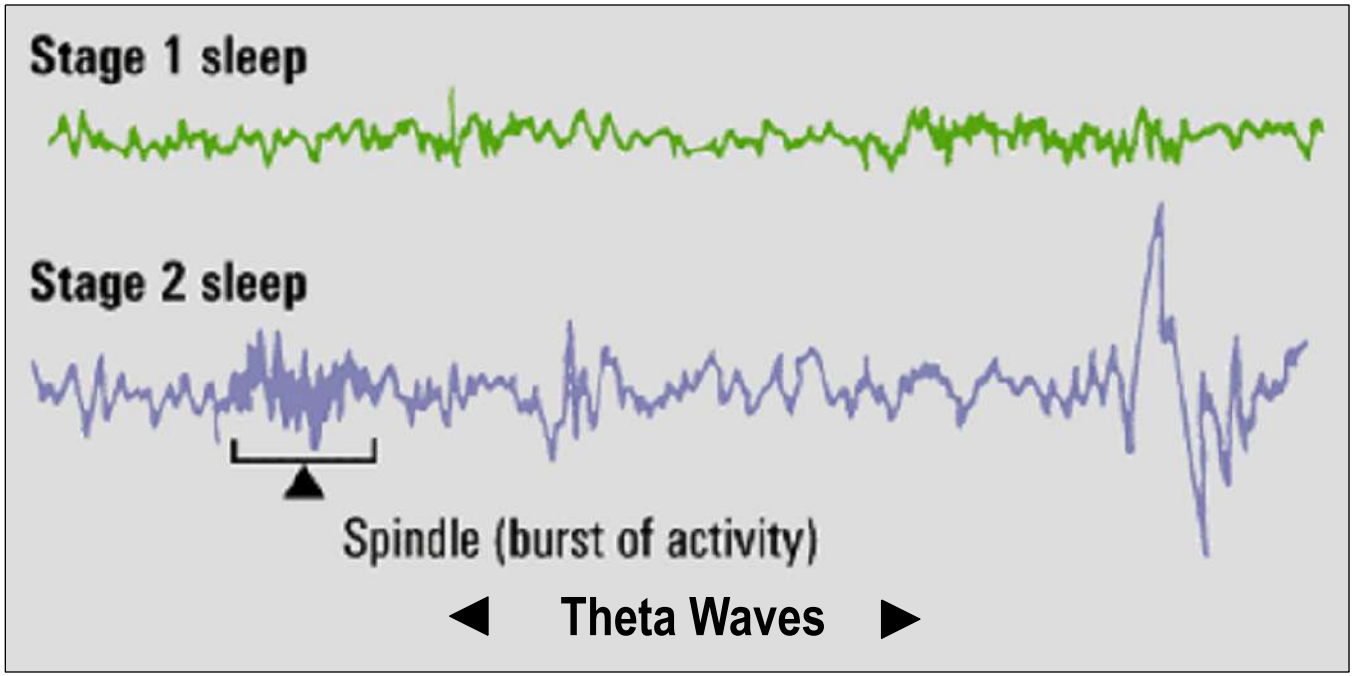
Awake but Relaxed

When an individual closes his eyes but remains awake, his brain activity slows down to a large amplitude and slow, regular alpha waves (9-14 cps). A meditating person exhibits an alpha brain activity.



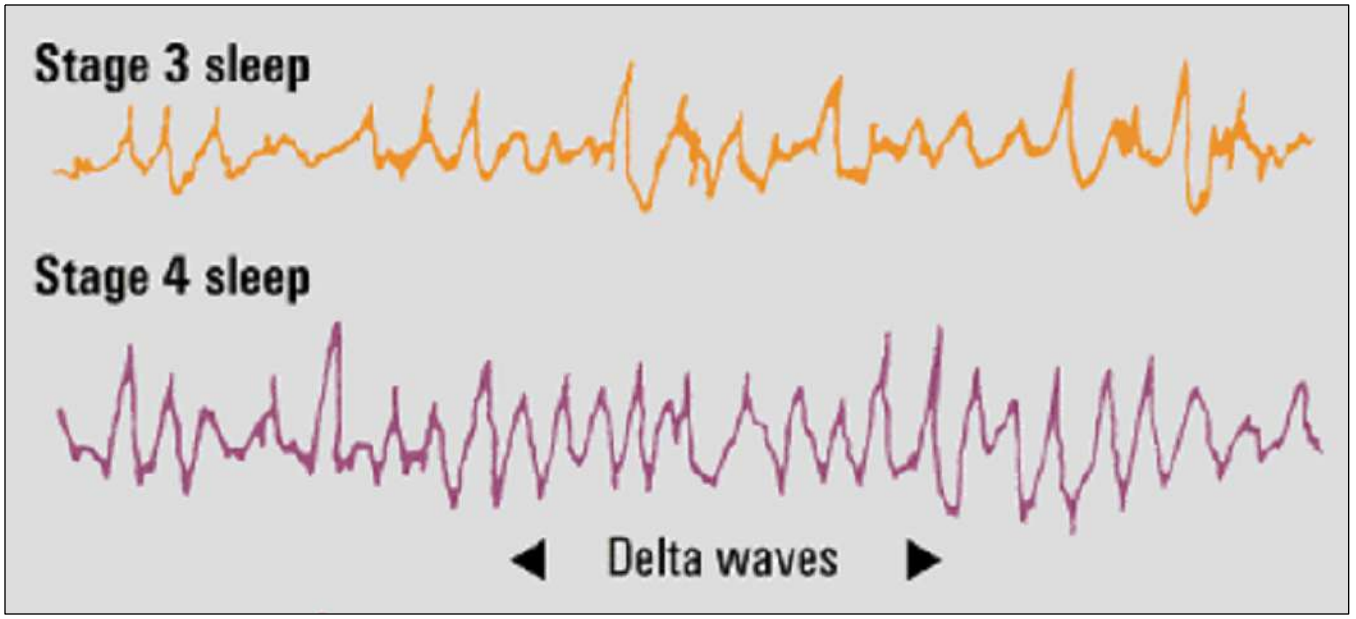
Sleep Stages 1-2

During early, light sleep (stages 1-2) the brain enters a high-amplitude, slow, regular wave form called theta waves (5-8 cps). A person who is daydreaming shows theta activity.



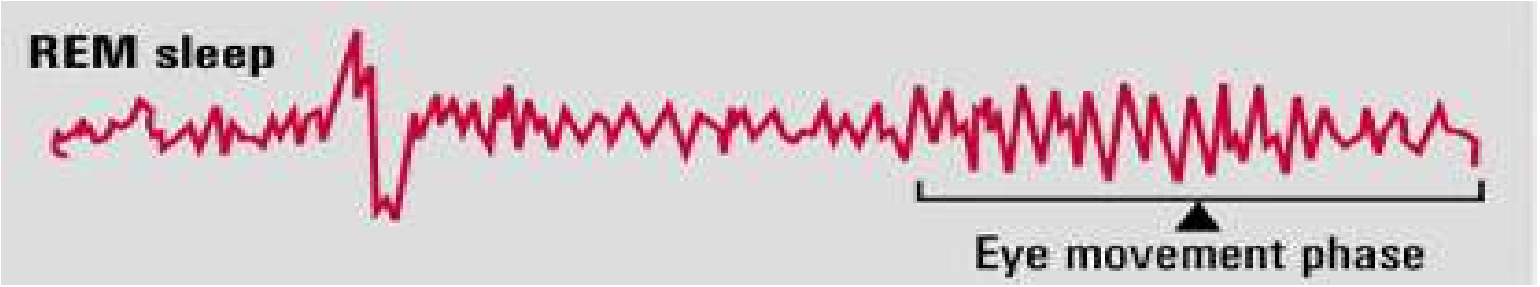
Sleep Stages 3-4

During deepest sleep (stages 3-4), brain activity slows down. There are large-amplitude, slow delta waves (1.5-4 cps).



Stage 5: REM Sleep

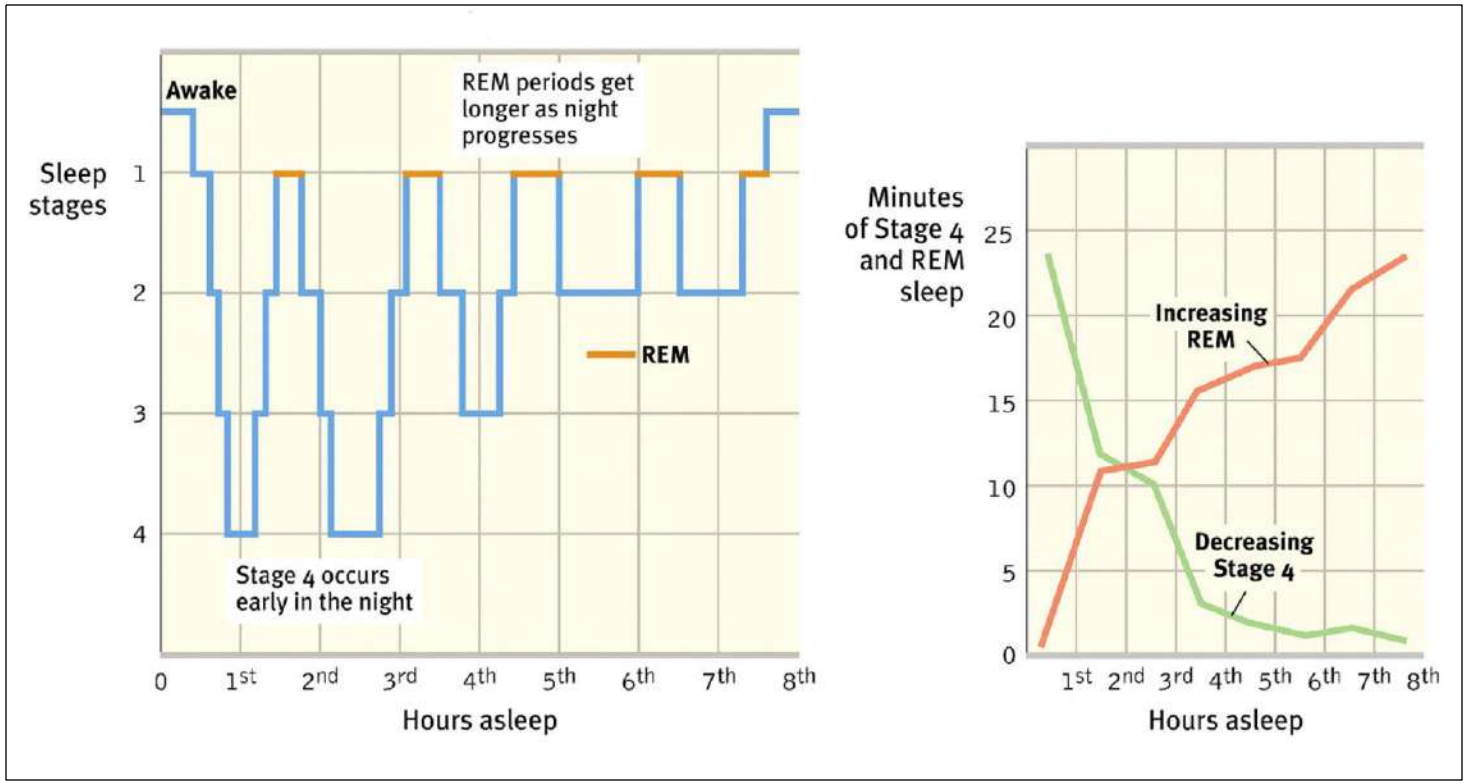
After reaching the deepest sleep stage (4), the sleep cycle starts moving backward towards stage 1. Although still asleep, the brain engages in low-amplitude, fast and regular beta waves (15-40 cps) much like awake-aroused state.



A person during this sleep exhibits
Rapid Eye Movements (REM)
and reports vivid dreams.

90-Minute Cycles During Sleep

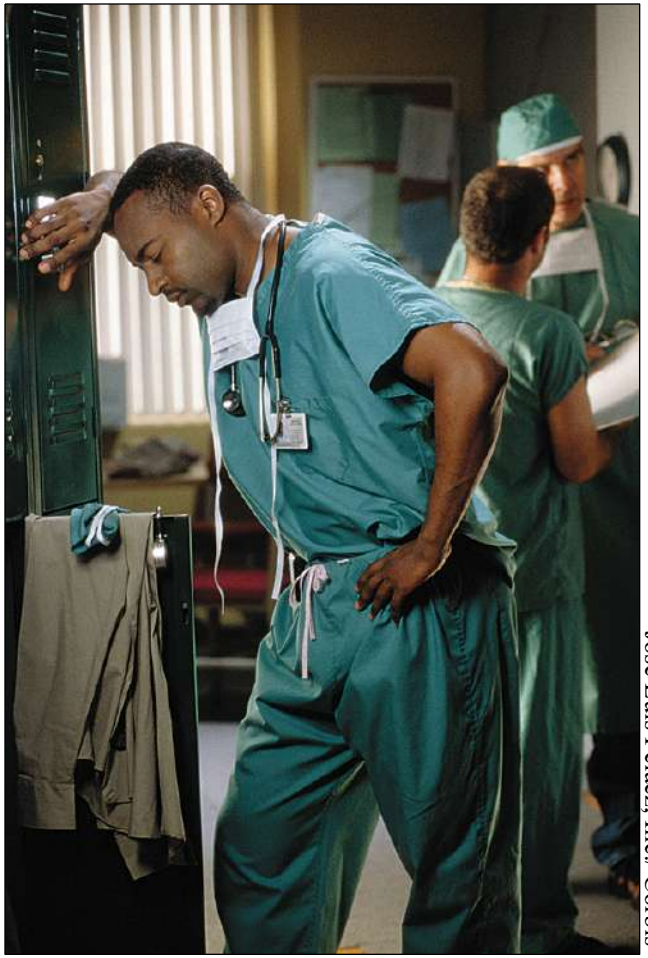
With each 90-minute cycle, stage 4 sleep decreases and the duration of REM sleep increases.



Why do we sleep?

We spend one-third of our lives sleeping.

If an individual remains awake for several days, immune function and concentration deteriorates and the risk of accidents increases.



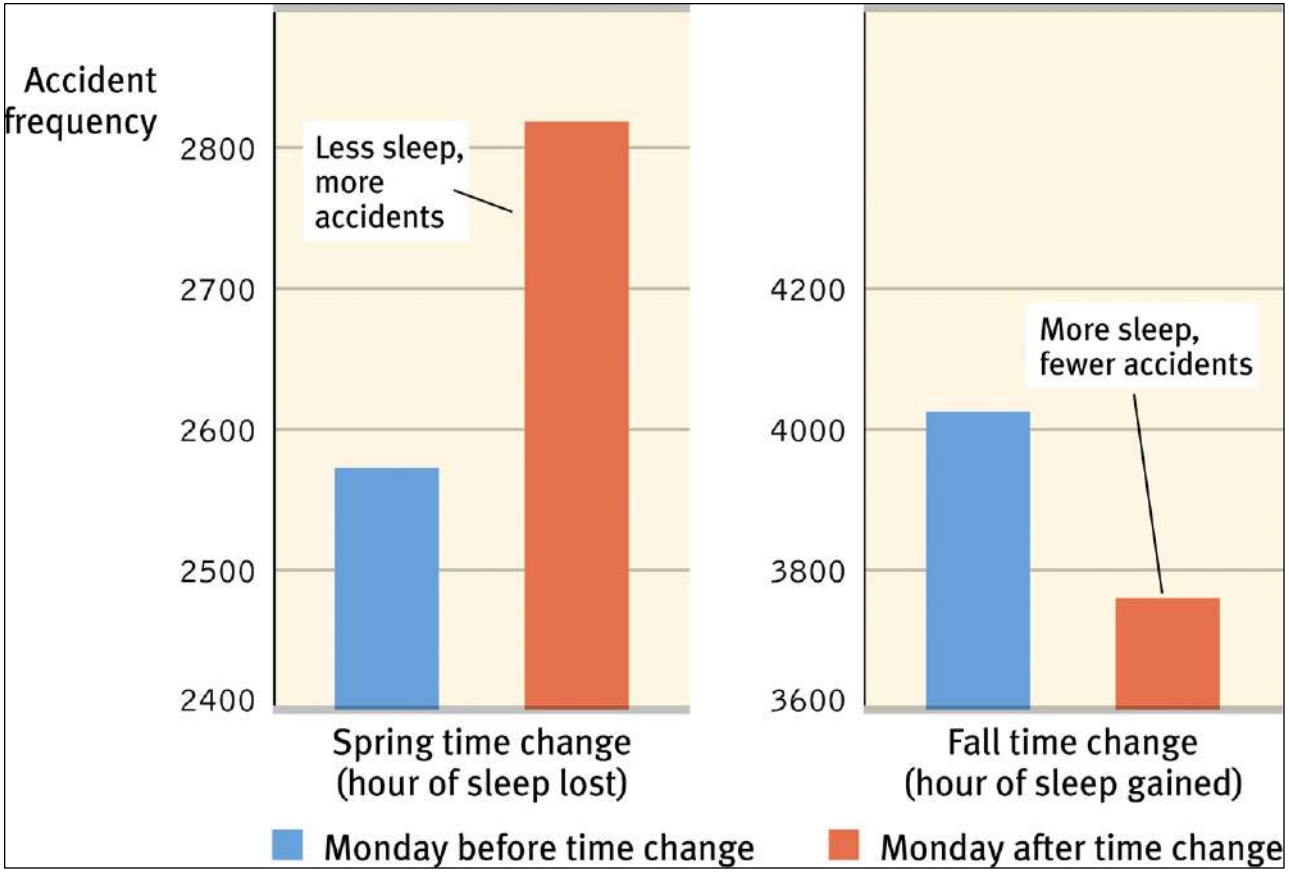
Jose Luis Pelaez, Inc./ Corbis

Sleep Deprivation

1. Fatigue and subsequent death.
2. Impaired concentration.
3. Emotional irritability.
4. Depressed immune system.
5. Greater vulnerability.

Accidents

Frequency of accidents increase with loss of sleep



Sleep Theories

1. Sleep Protects: Sleeping in the darkness when predators loomed about kept our ancestors out of harm's way.
2. Sleep Helps us Recover: Sleep helps restore and repair brain tissue.
3. Sleep Helps us Remember: Sleep restores and rebuilds our fading memories.
4. Sleep may play a role in the growth process: During sleep, the pituitary gland releases growth hormone. Older people release less of this hormone and sleep less.

Sleep Disorders

- Insomnia: A persistent inability to fall asleep.
- Narcolepsy: Overpowering urge to fall asleep that may occur while talking or standing up.
- Sleep apnea: Failure to breathe when asleep.

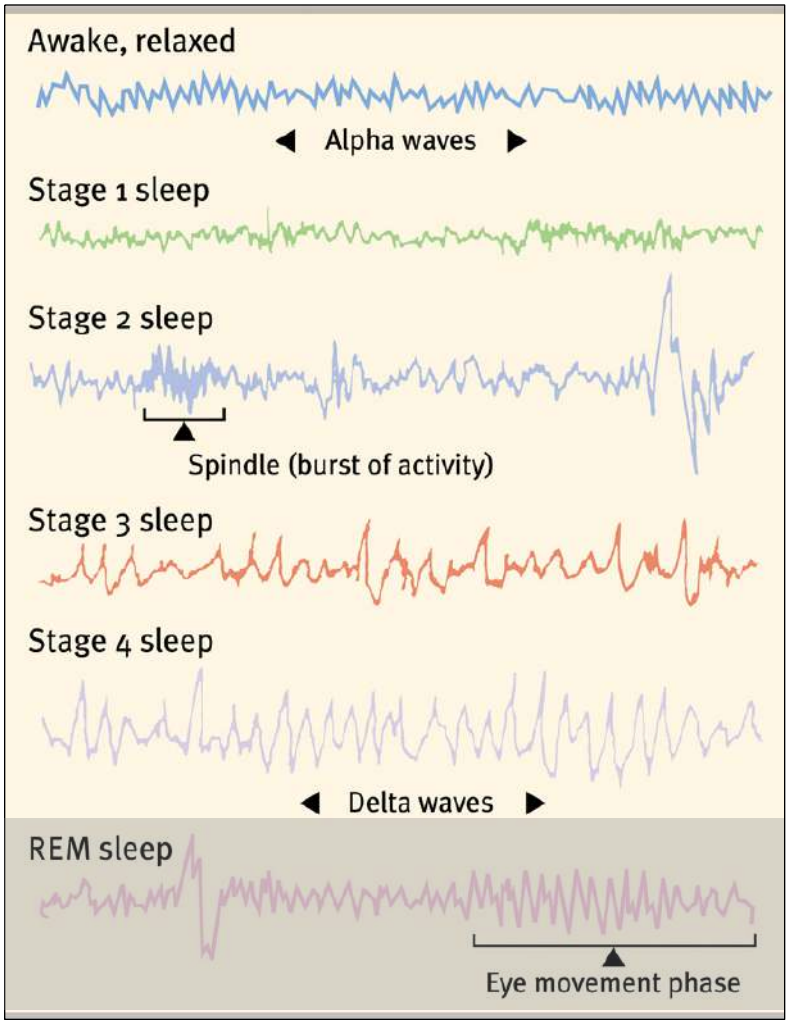
Sleep Disorders

Children are most prone to:

- Night terrors: The sudden arousal from sleep with intense fear accompanied by physiological reactions (e.g., rapid heart rate, perspiration) which occur during Stage 4 sleep.
- Sleepwalking: A Stage 4 disorder which is usually harmless and unrecalled the next day.
- Sleeptalking: A condition that runs in families, like sleepwalking.

Dreams

The link between REM sleep and dreaming has opened up a new era of dream research.



What We Dream

Manifest Content: A Freudian term meaning the story line of dreams.

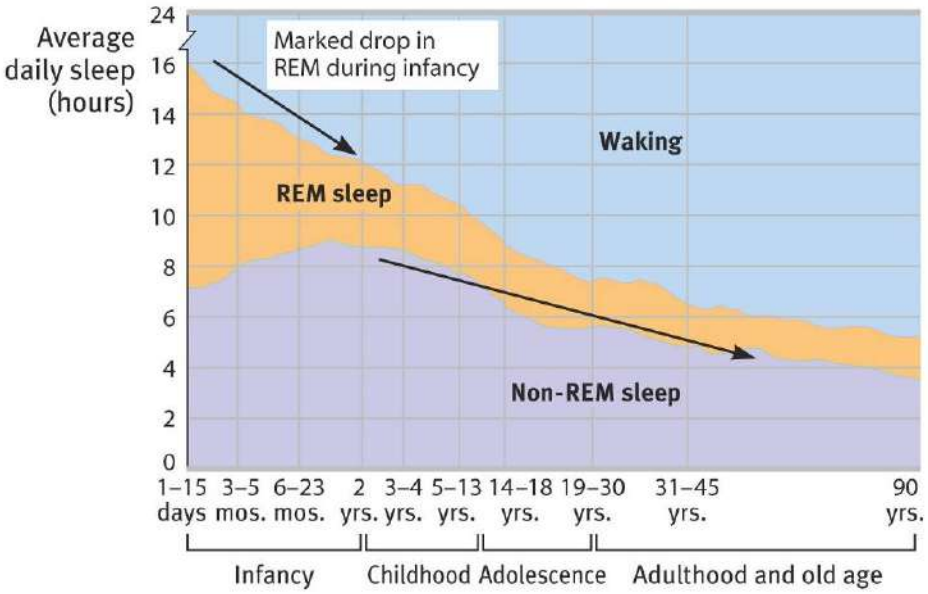
- Negative Emotional Content: 8 out of 10 dreams have negative emotional content.
- Failure Dreams: People commonly dream about failure, being attacked, pursued, rejected, or struck with misfortune.
- Sexual Dreams: Contrary to our thinking, sexual dreams are sparse. Sexual dreams in men are 1 in 10; and in women 1 in 30.

Why We Dream

- Wish Fulfillment: Sigmund Freud suggested that dreams provide a psychic safety valve to discharge unacceptable feelings. The dream's manifest (apparent) content may also have symbolic meanings (latent content) that signify our unacceptable feelings.
- Information Processing: Dreams may help sift, sort, and fix a day's experiences in our memories.

Why We Dream

- Physiological Function: Dreams provide the sleeping brain with periodic stimulation to develop and preserve neural pathways. Neural networks of newborns are quickly developing; therefore, they need more sleep.



Why We Dream

- Activation-Synthesis Theory: Suggests that the brain engages in a lot of random neural activity. Dreams make sense of this activity.
- Cognitive Development: Some researchers argue that we dream as a part of brain maturation and cognitive development.

All dream researchers believe we need REM sleep. When deprived of REM sleep and then allowed to sleep, we show increased REM sleep called REM Rebound.

Dream Theories

Summary

DREAM THEORIES

Theory	Explanation	Critical Considerations
Freud's wish-fulfillment	Dreams provide a "psychic safety valve"—expressing otherwise unacceptable feelings; contain manifest (remembered) content and a deeper layer of latent content—a hidden meaning.	Lacks any scientific support; dreams may be interpreted in many different ways.
Information-processing	Dreams help us sort out the day's events and consolidate our memories.	But why do we sometimes dream about things we have not experienced?
Physiological function	Regular brain stimulation from REM sleep may help develop and preserve neural pathways.	This may be true, but it does not explain why we experience *meaningful* dreams.
Activation-synthesis	REM sleep triggers impulses that evoke random visual memories, which our sleeping brain weaves into stories.	The individual's brain is weaving the stories, which still tells us something about the dreamer.
Cognitive theory	Dream content reflects dreamers' cognitive development—their knowledge and understanding.	Does not address the neuroscience of dreams.

Hypnosis

A social interaction in which one person (the hypnotist) suggests to another (the subject) that certain perceptions, feelings, thoughts, or behaviors will spontaneously occur.

http://iddiokrysto.blog.excite.it

Hypnos: Greek god of sleep

Facts and Falsehood

Those who practice hypnosis agree that its power resides in the subject's openness to suggestion.

Can anyone experience hypnosis?	Yes, to some extent.
Can hypnosis enhance recall of forgotten events?	No.

Facts and Falsehood

Can hypnosis force people to act against their will?	No.
Can hypnosis be therapeutic?	Yes. Self-suggestion can heal too.
Can hypnosis alleviate pain?	Yes. Lamaze can do that too.

Explaining the Hypnotized State

- Social Influence Theory: Hypnotic subjects may simply be imaginative actors playing a social role.
- Divided Consciousness Theory: Hypnosis is a special state of dissociated (divided) consciousness (Hilgard, 1986, 1992).

Courtesy of News and Publications Service, Stanford University

(Hilgard, 1992)

Both Theories

Attention is diverted from an aversive odor. How?

Divided-consciousness theory:

hypnosis has caused a split in awareness

Mimi Forsyth

Social influence theory:

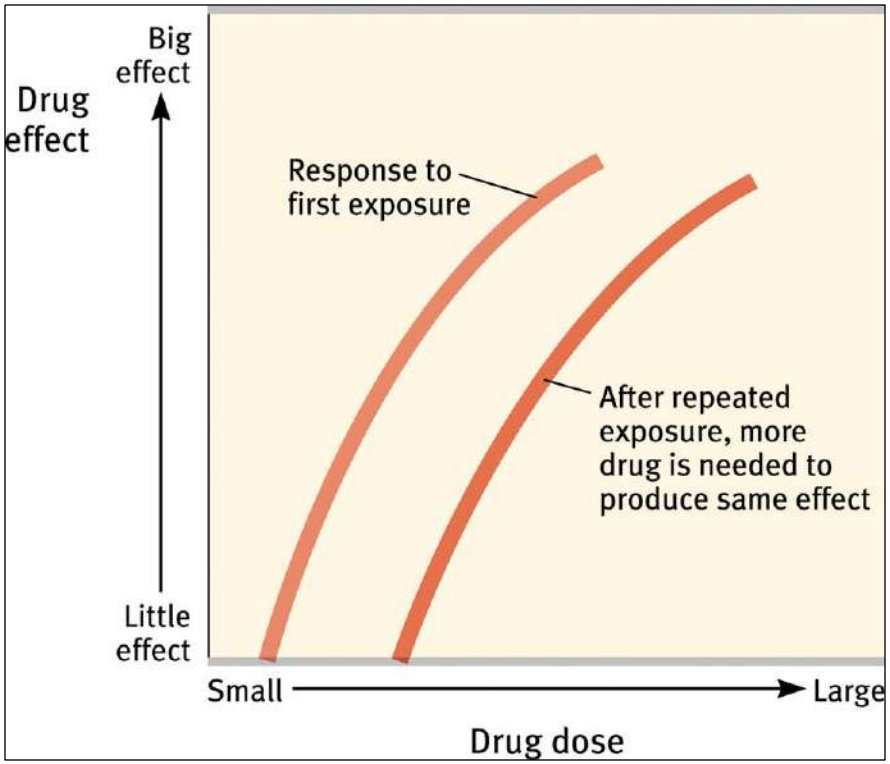
the subject is so caught up in the hypnotized role that she ignores the odor

Drugs and Consciousness

Psychoactive Drug: A chemical substance that alters perceptions and mood (affects consciousness).

Dependence & Addiction

Continued use of a psychoactive drug produces tolerance. With repeated exposure to a drug, the drug's effect lessens. Thus it takes greater quantities to get the desired effect.



Withdrawal & Dependence

- Withdrawal: Upon stopping use of a drug (after addiction), users may experience the undesirable effects of withdrawal.

- Dependence: Absence of a drug may lead to a feeling of physical pain, intense cravings (physical dependence), and negative emotions (psychological dependence).

Misconceptions About Addiction

Addiction is a craving for a chemical substance, despite its adverse consequences (physical & psychological).

- Addictive drugs quickly corrupt.
- Addiction cannot be overcome voluntarily.
- Addiction is no different than repetitive pleasure-seeking behaviors.

Psychoactive Drugs

Psychoactive drugs are divided into three groups.

1. Depressants
2. Stimulants
3. Hallucinogens

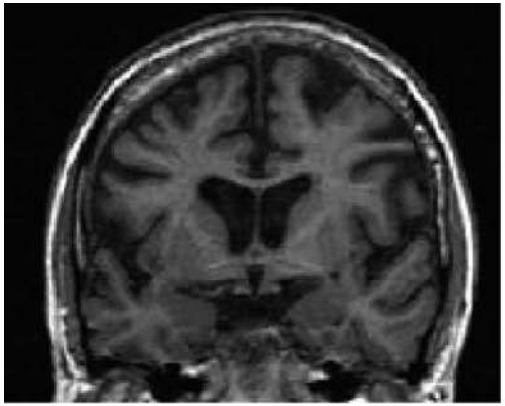
Depressants

Depressants are drugs that reduce neural activity and slow body functions. They include:

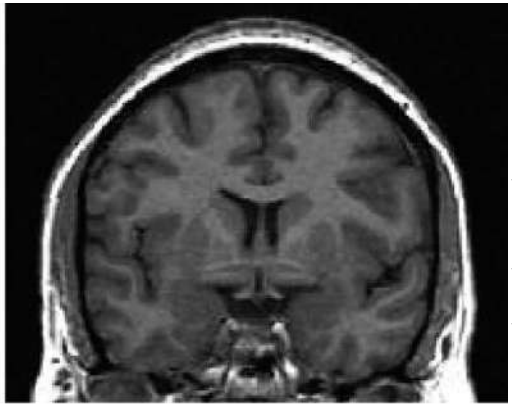
1. Alcohol
2. Barbiturates
3. Opiates

Depressants

- Alcohol affects motor skills, judgment, and memory…and increases aggressiveness while reducing self awareness.



Scan of woman with alcoholism



Scan of woman without alcoholism

Daniel Hommer, NIAAA, NIH, HHS

Ray Ng/ Time & Life Pictures/ Getty Images

Drinking and Driving

Depressants

2. Barbiturates: Drugs that depress the activity of the central nervous system, reducing anxiety but impairing memory and judgment. Nembutal, Seconal, and Amytal are some examples.

Depressants

3. Opiates: Opium and its derivatives (morphine and heroin) depress neural activity, temporarily lessening pain and anxiety. They are highly addictive.

http://opioids.com/timeline

Stimulants

Stimulants are drugs that excite neural activity and speed up body functions. Examples of stimulants are:

1. Caffeine
2. Nicotine
3. Cocaine
4. Ecstasy
5. Amphetamines
6. Methamphetamines

Caffeine & Nicotine

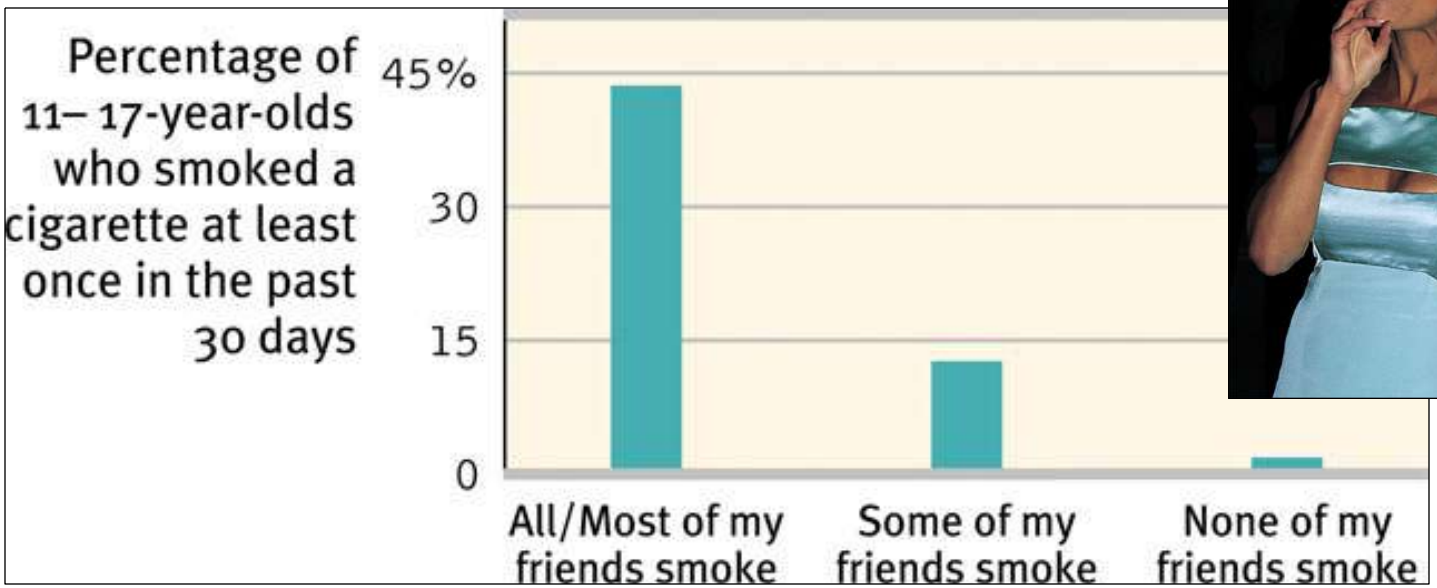
Caffeine and nicotine increase heart and breathing rates and other autonomic functions to provide energy.

http://www.tech-res-intl.com

http://office.microsoft.com/clipart

Why Do People Smoke?

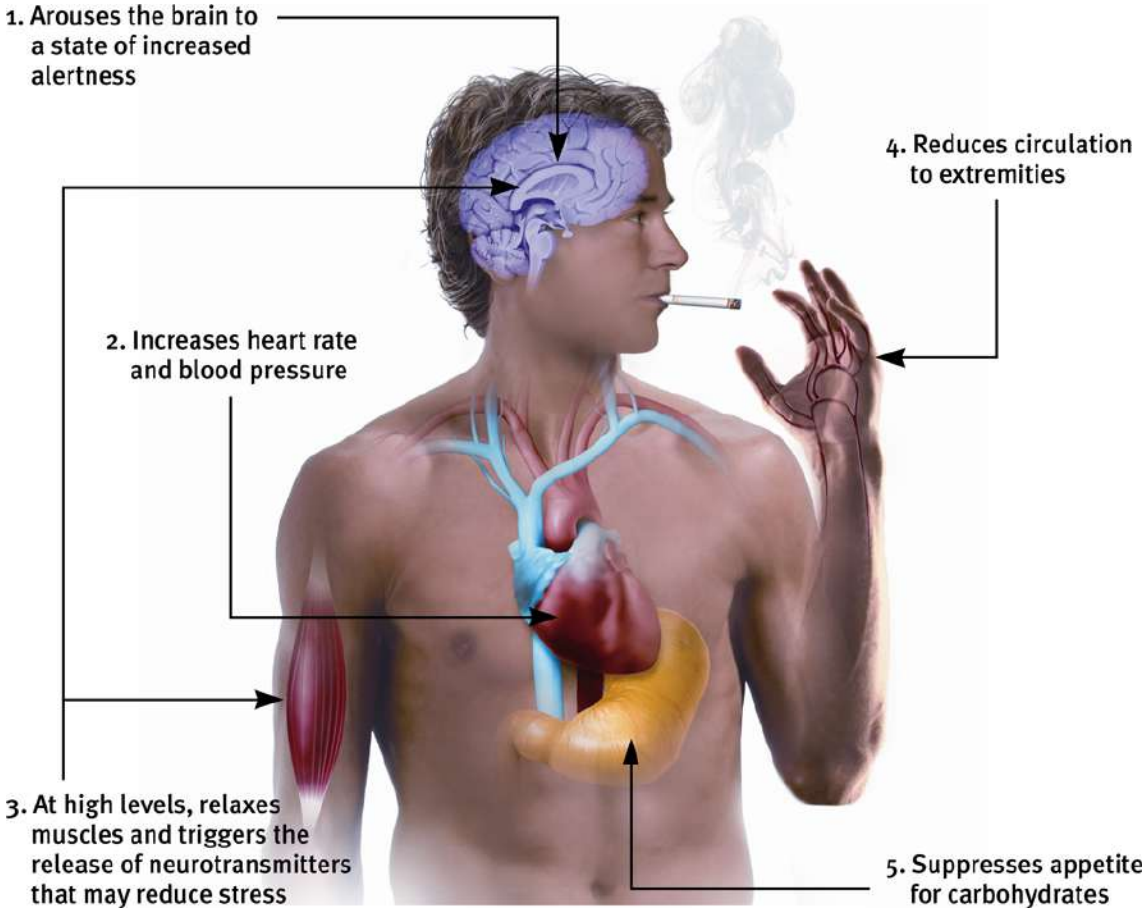
1. People smoke because it is socially rewarding.
2. Smoking is also a result of genetic factors.



Russel Einhorn/ The Gamma Liason Network

Why Do People Smoke?

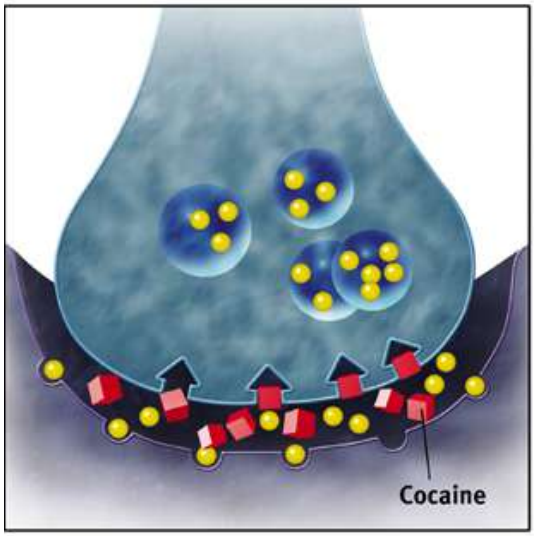
3. Nicotine takes away unpleasant cravings (negative reinforcement) by triggering epinephrine, norepinephrine, dopamine, and endorphins.
4. Nicotine itself is rewarding (positive reinforcement).



Cocaine

Cocaine induces immediate euphoria followed by a crash. Crack, a form of cocaine, can be smoked. Other forms of cocaine can be sniffed or injected.

http://www.ohsinc.com



(c)

By binding to the sites that normally reabsorb neurotransmitter molecules, cocaine blocks reuptake of dopamine, norepinephrine, and serotonin (Ray & Ksir, 1990). The extra neurotransmitter molecules therefore remain in the synapse, intensifying their normal mood-altering effects and producing a euphoric rush. When the cocaine level drops, the absence of these neurotransmitters produces a crash.

Ecstasy

Ecstasy or Methylenedioxymethamphetamine (MDMA) is a stimulant and mild hallucinogen. It produces a euphoric high and can damage serotonin-producing neurons, which results in a permanent deflation of mood and impairment of memory.

Hallucinogens

Hallucinogens are psychedelic (mind-manifesting) drugs that distort perceptions and evoke sensory images in the absence of sensory input.

Ronald K. Siegel

Hallucinogens

1. LSD: (lysergic acid diethylamide) powerful hallucinogenic drug that is also known as *acid*.
2. THC (delta-9-tetrahydrocannabinol): is the major active ingredient in marijuana (hemp plant) that triggers a variety of effects, including mild hallucinations.

Hemp Plant

Drugs

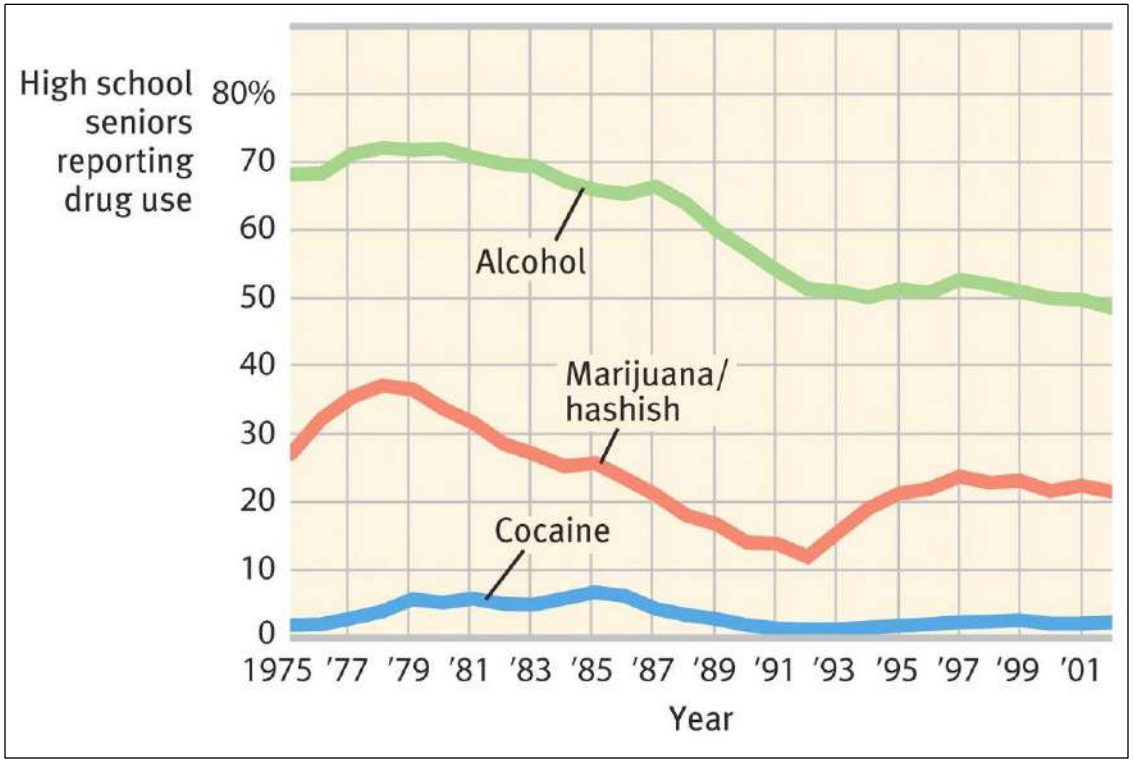
Summary

A GUIDE TO SELECTED PSYCHOACTIVE DRUGS

Drug	Type	Pleasurable Effects	Adverse Effects
Alcohol	Depressant	Initial high followed by relaxation and disinhibition	Depression, memory loss, organ damage, impaired reactions
Heroin	Depressant	Rush of euphoria, relief from pain	Depressed physiology, agonizing withdrawal
Caffeine	Stimulant	Increased alertness and wakefulness	Anxiety, restlessness, and insomnia in high doses; uncomfortable withdrawal
Methamphetamine ("speed," "ice")	Stimulant	Euphoria, alertness, energy	Irritability, insomnia, hypertension, seizures
Cocaine	Stimulant	Rush of euphoria, confidence, energy	Cardiovascular stress, suspiciousness, depressive crash
Nicotine	Stimulant	Arousal and relaxation, sense of well-being	Heart disease, cancer (from tars)
Ecstasy (MDMA)	Stimulant; mild hallucinogen	Emotional elevation, disinhibition	Dehydration, overheating, and depressed mood, cognitive, and immune functioning
Marijuana	Mild hallucinogen	Enhanced sensation, relief of pain, distortion of time, relaxation	Impaired learning and memory, increased risk of psychological disorders, lung damage from smoke

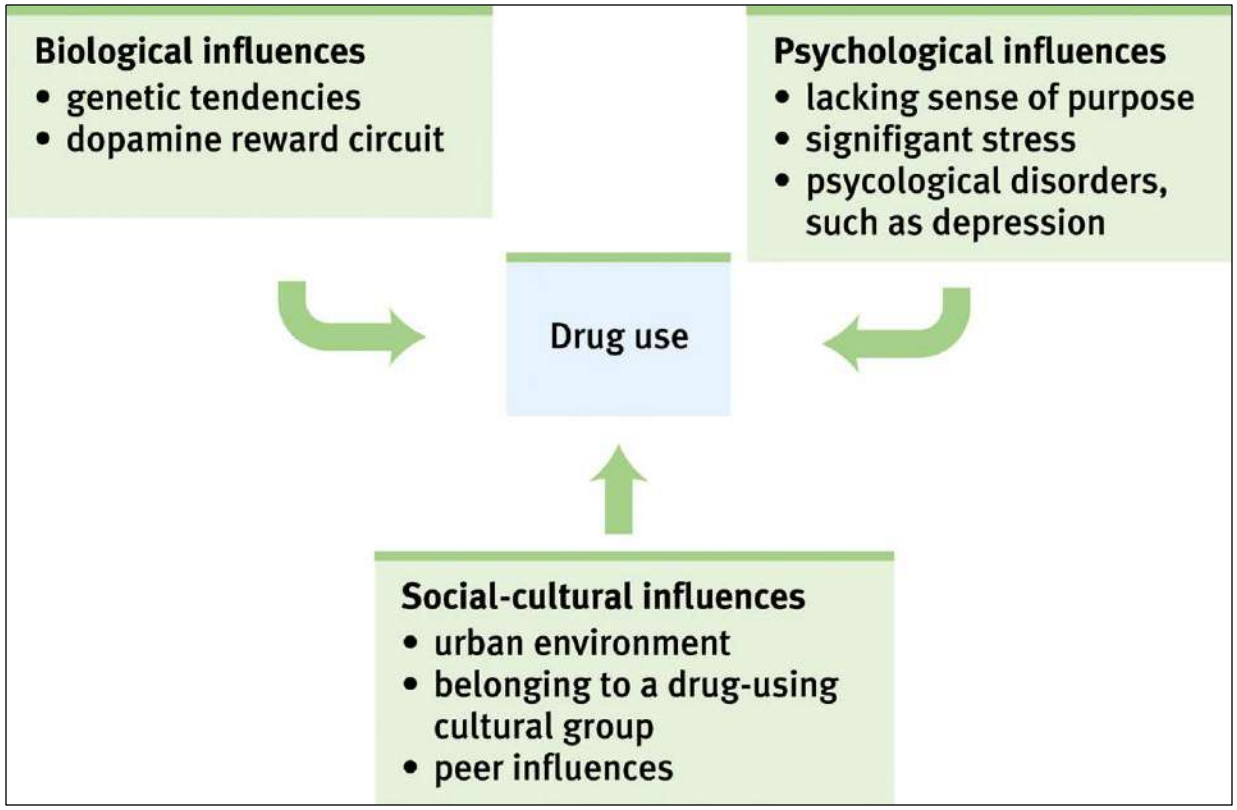
Influences on Drug Use

The graph below shows the percentage of US high-school seniors reporting their use of alcohol, marijuana, and cocaine from the 70s to the late 90s.



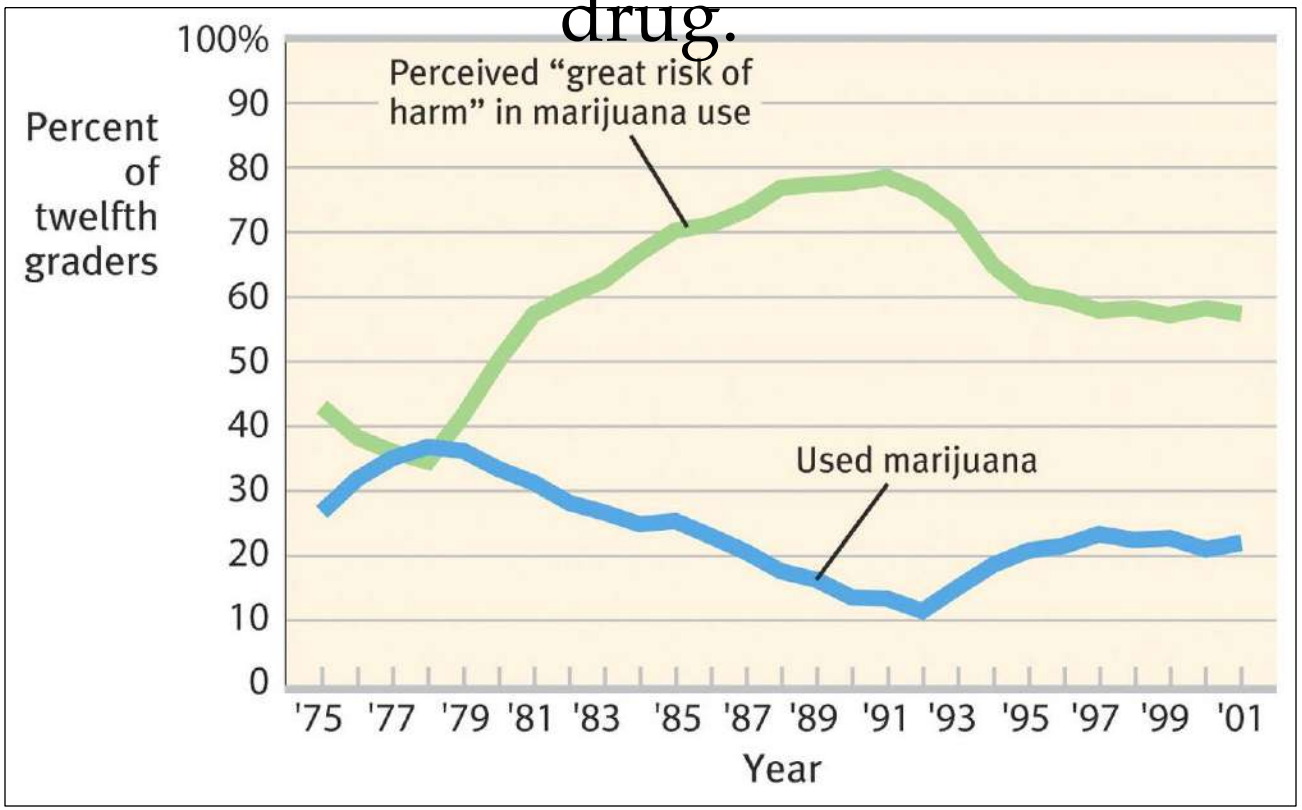
Influences on Drug Use

The use of drugs is based on biological, psychological, and social-cultural influences.



Marijuana Use

The use of marijuana in teenagers is directly related to the "perceived risk" involved with the drug.



Influence for Drug Prevention and Treatment

1. Education about the long-term costs
2. Efforts to boost people's self-esteem and purpose
3. Attempts to modify peer associations and teaching refusal skills

Near-Death Experiences

After a close brush with death, many people report an experience of moving through a dark tunnel with a light at the end. Under the influence of hallucinogens, others report bright lights at the center of their field of vision.