

<p style="text-align: center;"><u>Consciousness</u></p> <ul style="list-style-type: none">• How do psychologists define consciousness?• American sleep patterns (National Sleep Survey of 2002)• Do you get enough sleep survey• Consequences of sleep deprivation• The function of sleep• Sleep and the brain• Who is at risk of sleep deprivation? What are the possible consequences?• Why is learning about the effects of sleep deprivation important?	<p style="text-align: center;"><u>Psychoactive drugs</u></p> <ul style="list-style-type: none">• Categories of psychoactive drugs your textbook uses<ul style="list-style-type: none">○ Depressants○ Opiates○ Stimulants○ Psychedelic Drugs○ Designer “club” drugs• Drug categories and neurotransmitters• Drug tolerance, Withdrawal and compensatory response• Alcohol and the brain
<p style="text-align: center;"><u>Hypnosis</u></p> <ul style="list-style-type: none">• What are common beliefs about hypnosis?• What can hypnosis do?• What hypnosis cannot do.• Factors related and unrelated to hypnotic susceptibility• Theories of hypnosis<ul style="list-style-type: none">○ Social-Cognitive Theory○ Dissociation (or neo-dissociation) Theory	

What Questions Can this Chapter Address?

Consciousness: Our moment-to-moment awareness of ourselves and our environment.

- What are the effects of sleep deprivation on thinking
- What are the effects of sleep deprivation on behavior?
- How does sleep change across the lifespan?
- Why do we sleep?
- “What do you Really Want to Know about Sleep” (In Focus 4.1, page 148)
- “What do you Really Want to Know about Dreams?” (In Focus 4.2, page 159)
- How can you improve the quality of your sleep (see Application Improving Sleep and Mental Performance, page 184)
- What are some problems with casually testing the claim “dreams predict the future”?
- How do drugs influence behavior (also see Chapter 2)?
- What are the facts and fictions about hypnosis? What do psychologists know about hypnosis and the following:
 - sensory and perceptual changes,
 - posthypnotic suggestions,
 - habit control and
 - memory
- Why do health experts consider alcohol to be one the most dangerous of the legal and illegal drugs?

What did the National Sleep Foundation find about American Sleep Patterns?

The National Sleep Foundation Survey: Asleep at the Wheel (www.sleepfoundation.org)

Key findings of the Omnibus Sleep in America Poll, a national survey of randomly selected American adults:

	1998	2002
• reported being so sleepy during the day that it interfered with their daily activities	37%	37%
• compensated for sleep lost during the week by sleeping an extra hour or more on the weekends	44%	40%
• have used caffeine to help them stay awake in the past year		43%
• have driven when drowsy during the past year	57%	51%
• have <u>actually</u> fallen asleep at the wheel during the past year	23%	17%
• have had a traffic accident due to being drowsy or falling asleep at the wheel	1.5%	1%

Do You Get Enough Sleep?

Many college students do not get enough sleep. In a survey of more than 200,000 first year students, more than 80% say that stayed up all night at least once during the last year. To evaluate whether you are sleep deprived, answer the following questions.

Yes	No	
_____	_____	I need an alarm clock to wake up at the appropriate time.
_____	_____	It's a struggle for me to get out of bed in the morning.
_____	_____	I feel tired, irritable, and stressed out during the week.
_____	_____	I have trouble concentrating.
_____	_____	I have trouble remembering.
_____	_____	I feel slow with critical thinking, problem solving, and being creative.
_____	_____	I often fall asleep watching TV.
_____	_____	I often fall asleep in boring meetings or lectures in warm rooms.
_____	_____	I often fall asleep after heavy meals or after low doses of alcohol.
_____	_____	I often feel drowsy while driving.
_____	_____	I often fall asleep within five minutes of getting into bed.
_____	_____	I often sleep extra hours on weekend mornings.
_____	_____	I often need a nap to get through the day.
_____	_____	I have dark circles around my eyes.

According to sleep expert James Maas (1998), who developed this quiz, if you responded "yes" to three or more of these items, you probably are not getting enough sleep. If you are not getting enough sleep, the following behavior strategies might help you:

1. Sleep only when sleepy.
2. If you can't fall asleep within 20 minutes, get up and do something boring until you feel sleepy.
3. Don't take naps.
4. Get up and go to bed the same time every day.
5. Refrain from exercise at least 4 hours before bedtime.
6. Only use your bed for sleeping.
7. Stay away from caffeine, nicotine, and alcohol at least 4-6 hours before bed.
8. Develop sleep rituals.
9. Have a light snack before bedtime.
10. Take a hot bath 90 minutes before bedtime.
11. Make sure your bed and bedroom are quiet and comfortable.

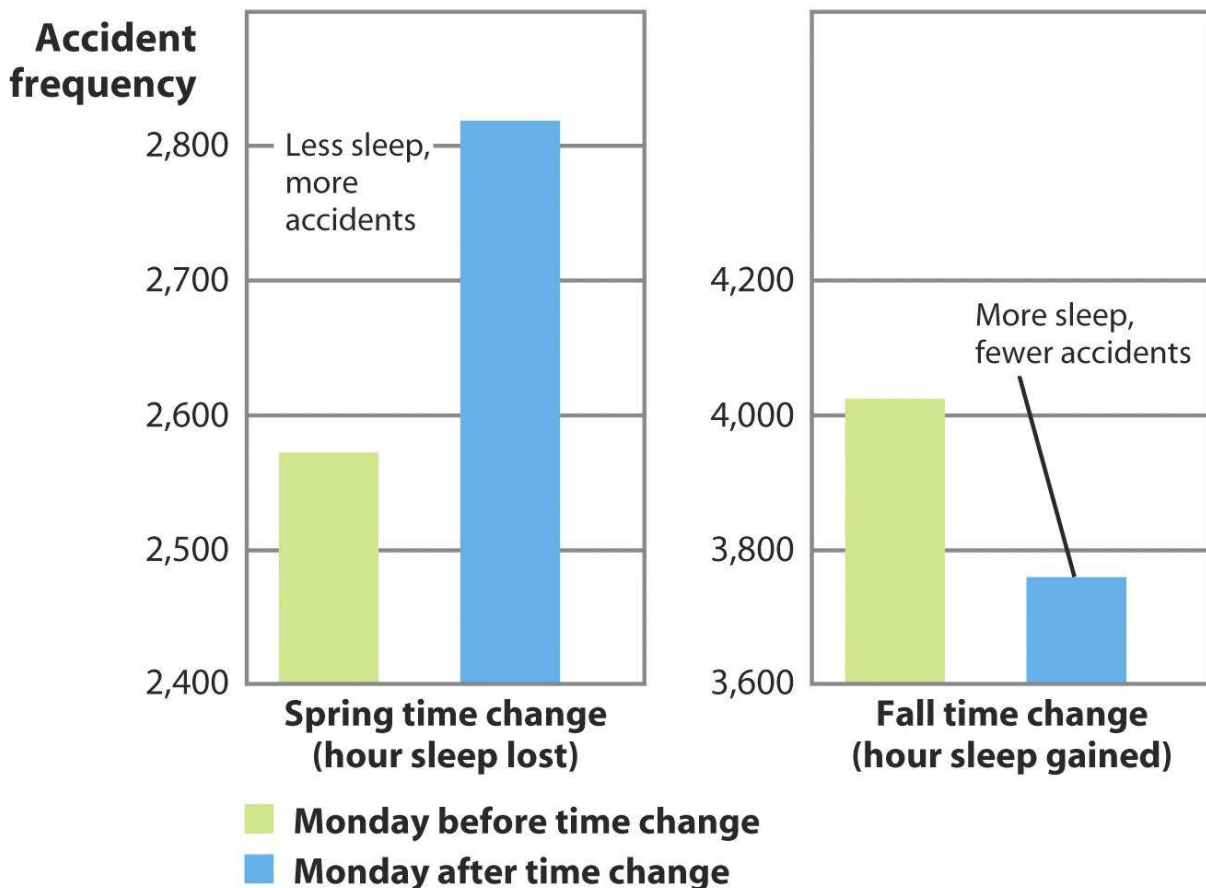
What are the Consequences of Sleep Deprivation?

- People who are awake for up to 19 hours were compared to those who had a blood-alcohol level of .08%--legal intoxication.

Those who were sleep deprived scored worse on performance tests and alertness scales.

- If a surgeon, pilot, or a person responsible for charging your credit card account has been pulling an all-nighter, they might as well been drunk (as of 2001, pilots are scheduled for up to 18 hours and may be required to work up to 26 hours).
- Disruptions in mood, mental abilities, reaction time, perceptual skills and complex motor skills
 - Increased sensitivity to pain
 - Drooping eyelids
 - Staring
 - Trembling hands
 - Decreased reaction time
 - Slowed speech and thinking
 - Decreased attention / concentration (on the job or at school)
 - “Tunnel vision”
 - hallucinations
 - Increased irritability
 - Paranoia
 - Poorer judgment
 - Weakened immune system

Canadian Traffic Accidents, 1991 and 1992



The Monday after the spring time change, when people lose sleep, accidents increased as compared with the Monday before. After the fall time change, they dropped when people got more sleep.

According to the National Sleep Foundation,

- four in ten young adults say they are sleepy at work two or more days a week.
- Teenagers typically need 8 to 9 hours of sleep, but they now average 2 hours less sleep than their great-grandparents 80 years ago.

Sleep researcher William Dement reports that 80% of students are “dangerously sleep deprived”.

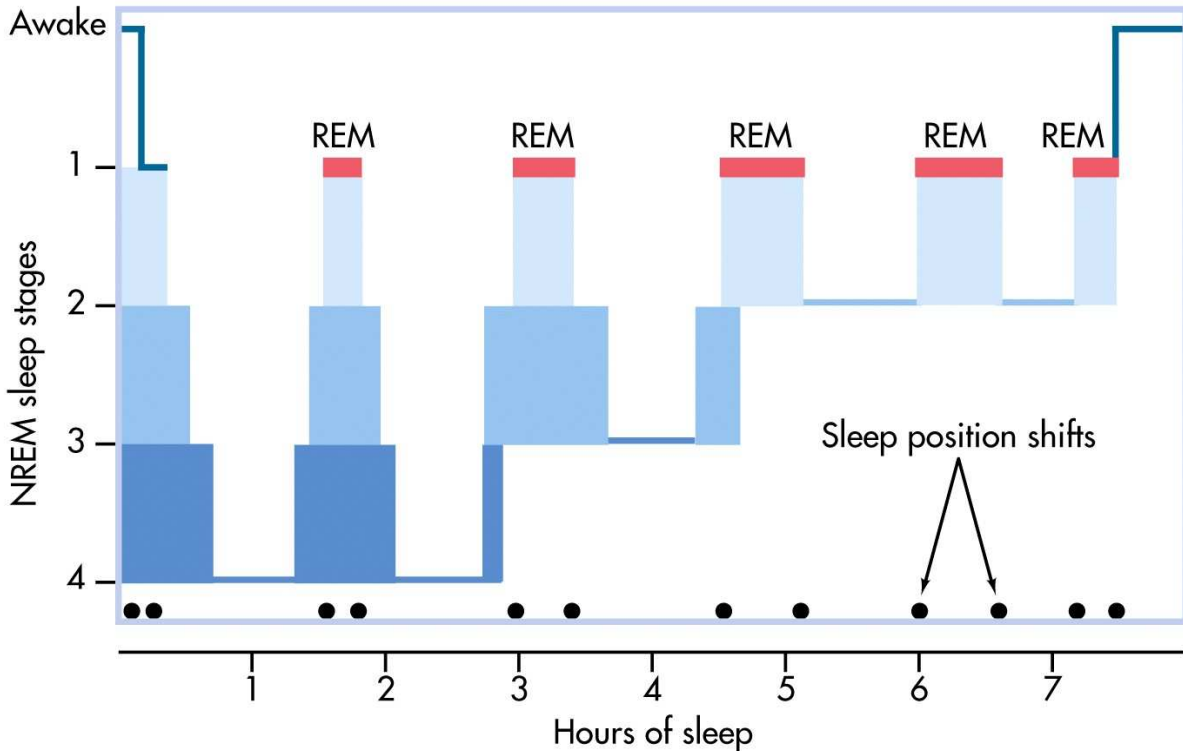
Such individuals “are at high risk of some sort of accident...Sleep deprivation entails

- difficulty studying,
- diminished productivity,
- tendency to make mistakes,
- irritability and
- fatigue.”

To manage your life with enough sleep to awaken naturally and well rested is to be more

- alert,
- productive,
- sociable,
- more resistant to stress and
- happy.

What do Psychologists Know about the Function of Sleep?



The restorative theory of sleep suggests that sleep promotes physiological processes that restore and rejuvenate the body and mind.

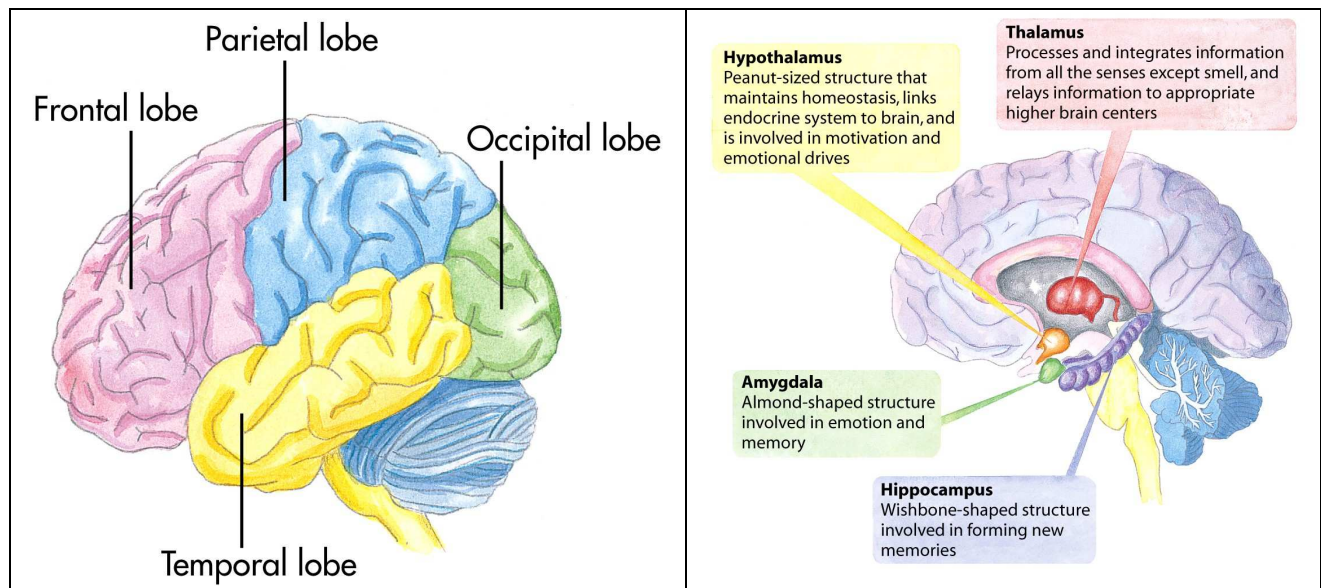
- NREM sleep is thought to be important for restoring the body. NREM sleep is increased following sleep deprivation, starvation, and strenuous athletic activity. It lasts about 50-70 minutes.
- REM sleep is thought to restore mental and brain functions. Both animal and human studies have shown that REM sleep increases after learning a novel task and that sleep deprivation following training disrupts learning. It lasts 5-15 minutes (depending when it is in the sleep cycle).

Sleep and the Brain

Psychologists know that if we don't sleep, our immune system is compromised. Mice that are deprived of sleep die of causes related to a weakened immune system.

During REM sleep:

- the frontal lobes (planning and decision making area) and
- parts of the primary visual cortex (processing visual information from the environment) are essentially shut down.
- the amygdala, hippocampus and other visual systems are active and
- the neurotransmitters serotonin, norepinephrine and dopamine are greatly reduced during REM sleep.



What are some health risks that scientists hypothesize are due to lack of sleep? There is no conclusive data on most of these risks yet, but scientists are in the process of addressing them.

Source: Brink, S. (2000). Sleepless Society. U.S. News and World Report, Oct 16, 62-72.

Where can you learn more:

- Dement, W. and Vaughan, C. (1999). The Promise of Sleep, Dell Books.
- <http://www.sleepfoundation.org>
- Walsleben, J. and Baron-Faust, R. (2000). A Woman's Guide to Sleep, Crown Books

- **Increased risk of diabetes:** Lack of sleep is probably a factor in increasing the risk of diabetes. After getting four hours of sleep per week, blood samples in men showed impaired glucose tolerance. Without sleep, the CNS had become more active, which inhibited the pancreas from producing insulin.
- **Increased risk of obesity:** Lack of sleep is probably a factor in increasing obesity in children (mostly boys). Growth hormones are secreted during the first round of sleep. This growth hormone also plays an important role in adulthood, controlling the body's proportion of fat and muscle. Hormone levels of leptin is decreased with sleep deprivation. Leptin tells the body when it is full.
- **Weakened immune system:** Lack of sleep is probably a factor in weakening the immune system. Rats that are deprived of sleep after two weeks die of infection and develop skin lesions (which indicates immune dysfunction).
- **Depression:** Lack of sleep is probably a factor in depression.
- **ADD:** Some children who are labeled ADD (attention deficit disorder) or hyperactive are actually acting that way because they are tired.
- **"Aging":** Sleep deprived men "look older" than they actually are. (A hormone called cortisol is replenished with sleep).
- **Increased risk of breast cancer:** Blind women are half as prone to breast cancer compared to sighted women. Too few hours spent in darkness is probably a factor in increased risk of breast cancer. Melatonin, primarily secreted at night, may trigger a reduction in the body's production of estrogen. Light interferes with the release of melatonin, allowing estrogen levels to rise.

What are the consequences of working irregular shifts?

About 6% of Americans are night shift-workers and an additional 25% are engaged in various patterns of shift work (1994).

What are the effects on behavior of shift work?

- Shift workers average 5.6 hours of sleep compared to regular shift workers average 7.5 hours of sleep.
- Men who work variable work schedules had higher rates of heavy drinking, job stress, and emotional problems compared to men working non-variable work schedules.
- Women who worked variable shifts report more use of sleeping pills, tranquilizers, and alcohol as well as more job stress and emotional problems.
- There was no difference in heavy cigarette smoking, coffee drinking between those working a variable work schedule compared to those working a non-variable work shift.
 - Who are the irregular shift workers at risk of sleep deprivation?
 - What are the specific risks of sleep deprivation for these irregular shift workers?

The effect of sleep deprivation is a social issue that involves understanding psychology, politics, sociology and economics.

- **Psychology:** The effects of sleep deprivation and the biological, psychological and environmental factors that lead to sleep deprivation.
- **Politics:** Why do politicians fail to address this problem?
- **Sociology:** What social structures make it more likely that employees will become sleep deprived (see economics)?
- **Economics:** Why is it profitable to move from eight hour shifts to 10 or 12 hours shifts your employees sleep deprived?

Why should you care whether or not people get enough sleep?

- How does their sleep deprivation affect you?
- What are the social consequences?
- You may get enough sleep, so why care?

If you believe that the effects of sleep deprivation and that they pose a health risk, we should be having a dialogue with our neighbors, employers, government, friends, etc.

- Why don't you hear about the problems associated with sleep deprivation in the news?
- Why do people get less sleep than what is recommended?
- How do the social institutions encourage or discourage sleep deprivation?
- How should we go about dealing with the health, safety and learning risks associated with sleep deprivation?

“Real-Life” consequences of sleep deprivation

A large number of accidents and near accidents can be traced to the lower efficiency of workers trying to adapt to new shifts. What are some examples where the accident can directly affect the lives of others?

- The crew of a 707 filed a flight plan to land at Los Angeles International Airport. The tower identified the plane on radar, but the plane passed the airport and continued out over the Pacific Ocean cruising at 32,000 feet. Alarmed, the air traffic controllers triggered alarms to go off in their cockpit. The entire crew had fallen asleep, and the plane was operating on automatic pilot! Fortunately, the airplane had enough fuel to return to Los Angeles.
- “Rest. That’s what I need is rest,” said Eastern Airlines James Reeves to the control tower on a September 1974 morning—30 minutes before crashing his airliner at low altitude killing the crew and all 38 passengers.
- 30% of Australian highway deaths occur when drivers fall asleep on long, monotonous roads.
- Shift changes have been implicated as one of the many factors in the Three Mile Island nuclear power plant accident. Operators failed to notice several warning signs of danger. The accident took place at 4 a.m., in the middle of the night shift. The operators had been on night shift a few days and had been on weekly rotating shifts for the previous six weeks.

- In one study of 1,000 locomotive engineers, 59% admitted that they dozed on most night trips.
- The National Highway Transportation Safety Administration estimates that 200,000 traffic accidents a year are sleep related, and that 20% of all drivers have dozed off at least once while behind the wheel. To avoid rush hour traffic, interstate truck drivers often drive late at night. Due to drowsiness, truck drivers are 16 times more likely to have an accident between 4 a.m. and 6 a.m. than during the daytime hours.

Source: Bernstein, Clarke-Stewart, Roy, Srull, & Wickens. (1994), Psychology, 3rd edition Instructor's Resource Manual.

Source: Gordon, N.P., Cleary, P.D., Parker, C.E. and Czeisler, C.A. (1986). The prevalence and health impact of shiftwork. American Journal of Public Health, 76, 1225-1228. (found in Instructors resource manual for the world of psychology, 2nd edition Wood and Wood, 1996

If a pilot wasn't aware that they were under the effects of sleep deprivation and crashed an airplane, they are probably more likely to blame themselves for the accident.