

CHAPTER
7

Altered States of Consciousness

PSYCHOLOGY JOURNAL

What is the purpose of sleep? Do you think it would be possible or desirable to perfect a way to eliminate the need for sleep or dreams? Write a one-page essay in your journal answering these questions. ■

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Chapter Overview

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Reader's Guide

■ **Main Idea**

Sleep—an essential state of consciousness—involves stages and periods of dreaming.

■ **Vocabulary**

- consciousness
- REM sleep
- circadian rhythm
- insomnia
- sleep apnea
- narcolepsy
- nightmares
- night terrors
- sleepwalking

■ **Objectives**

- Describe the research related to sleep and dreams.
- List and discuss sleep disorders.

EXPLORING PSYCHOLOGY

Losing Sleep

In 1959 New York disk jockey Peter Tripp stayed awake for 200 hours to raise money for charity. . . . After about 50 hours, he started having mild hallucinations, seeing cobwebs in his shoes when there were none there and thinking that specks of dirt were bugs; by 100 hours, he became delirious and saw a doctor's tweed suit as a tangle of furry worms; at 120 he needed a stimulant to keep him awake. After 150 hours, he was disoriented, not knowing who or where he was, and he became paranoid—he backed against a wall, letting no one pass behind him; by 200 hours, his hallucinations had taken a sinister turn, and he thought a doctor trying to examine him was an undertaker come to bury him.

—from *The Human Mind Explained* edited by Susan A. Greenfield, 1996

How important is sleep to humans? Sleep is vital to mental health. Peter Tripp found out that if a person is deprived of sleep, he or she will have psychological symptoms (although not all people have symptoms as extreme as Tripp's). Most people think of sleep as a state of unconsciousness, punctuated by brief periods of dreaming. This is only partially correct. Sleep is a state of altered consciousness, characterized by certain patterns of brain activity and inactivity.

What is consciousness? **Consciousness** is a state of awareness. When we discuss altered states of consciousness, we mean that people can have different levels of awareness. Consciousness can range from

consciousness: a state of awareness, including a person's feelings, sensations, ideas, and perceptions

alertness to nonalertness (see Figure 7.1). People who are fully aware with their attention focused on something are conscious of that something. A person who is not completely aware is in a different level of consciousness—an altered state of consciousness. Sleep illustrates an altered state of consciousness.

Although sleep is a major part of human and animal behavior, it has been extremely difficult to study until recently. A researcher cannot ask a sleeping person to report on the experience without first waking the person. The study of sleep was aided by the development of the electroencephalograph (EEG), a device that records the electrical activity of the brain.

WHY DO WE SLEEP?

We are not sure why people sleep. Sleep is characterized by unresponsiveness to the environment and usually limited physical mobility. Some people believe that sleep is restorative; it allows people to “charge up their batteries.” These people believe that sleep is a time when the brain recovers from exhaustion and stress. Other people believe it is a type of primitive hibernation: we sleep to conserve energy. Some suggest that sleep is an adaptive process; that is, in earlier times sleep kept humans out of harm’s way at night when humans would have been most vulnerable to animals with better night vision. Still other researchers believe we sleep to clear our minds of useless information. As a variation of this theory, some people believe we sleep to dream.

Figure 7.1 Freud’s Levels of Consciousness

Sigmund Freud identified three levels of consciousness. In his approach to consciousness, he claimed that preconscious ideas are not in your awareness now, but you are able to recall them with some effort. Unconscious ideas are hidden and unretrievable. *When would you use information from the preconscious level?*



STAGES OF SLEEP

As you begin to fall asleep, your body temperature decreases, your pulse rate drops, and your breathing becomes slow and even. Gradually, your eyes close and your brain briefly shows alpha waves on the EEG, which are associated with the absence of concentrated thought and with relaxation (see Figure 7.2). Your body may twitch, your eyes roll, and brief visual images flash across your mind (although your eyelids are shut) as you enter Stage I sleep, the lightest level of sleep.

Early Stages

In Stage I sleep, your pulse slows a bit more and your muscles relax, but your breathing becomes uneven and your brain waves grow irregular. If you were awakened during this stage, you would report that you were “just drifting.” This phase lasts for up to 10 minutes and is marked by the presence of theta waves, which are lower in amplitude and frequency than alpha waves. At this point, your brain waves occasionally shift from low-amplitude, high-frequency waves to high-amplitude, low-frequency waves—a pattern that indicates you have entered Stage II sleep. Your eyes roll slowly from side to side. Some 30 minutes later, you drift down into a deeper level of Stage III sleep, and large-amplitude delta waves begin to sweep your brain every second or so.

Later Stages

Stage IV is the deepest sleep of all, and it is difficult to waken a sleeper in this stage. Large, regular delta waves occurring more than 50 percent of the time indicate you are in a state of deep sleep. If you are awakened by a loud noise or sudden movement, you may feel disoriented. Talking out loud, sleepwalking, and bed-wetting—all of which may occur in this stage—leave no trace on the memory. Deep sleep is important to your physical and psychological well-being. Perhaps this is why people who are able to sleep only a few hours at a time descend rapidly into Stage IV and remain there for most of their nap.

On average a person spends 75 percent of sleep time in Stages I through IV. Once in Stage IV, something curious happens. While your muscles are even more relaxed than before, your eyes begin to move

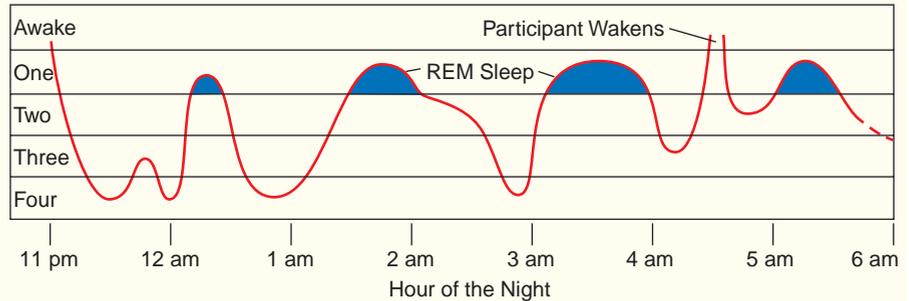
Figure 7.2

Patterns of Sleep

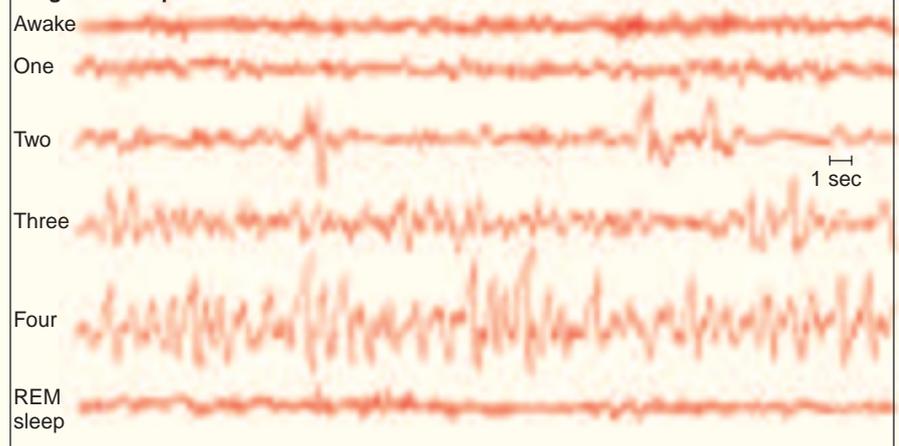
The top diagram shows the passage of a sleeper through the various stages of sleep over a seven-hour period. The bottom diagram shows the patterns of electrical activity (EEGs) in the brain that correspond to the various stages of sleep. The EEG pattern shown for being awake is one that occurs when a person is resting quietly with eyes closed.

How often during a night's sleep does a person reach Stage IV?

Stages of Sleep



Stages of Sleep



REM sleep: a stage of sleep characterized by rapid eye movements, a high level of brain activity, a deep relaxation of the muscles, and dreaming

rapidly. You have entered a more active type of sleep characterized by rapid eye movement. This is called **REM sleep**. Your pulse rate and breathing become irregular, and the levels of adrenal and sexual hormones in your blood rise—as if you were in the middle of an intensely emotional or physically demanding activity. Often, your face or fingers twitch and the large muscles in your arms and legs are paralyzed. Your brain now shows waves that closely resemble those of a person who is fully awake. For this reason, REM sleep is called active sleep. Stages I through IV are sometimes referred to as NREM (non-REM) or quiet sleep because of the absence of rapid eye movement. NREM sleep is accompanied by the slower pattern of brain waves. It is during REM sleep that almost all dreaming normally takes place.

REM sleep lasts from about 15 (early at night) to 45 (late at night) minutes, after which you retrace the descent to Stage IV. You go through this cycle every 90 minutes or so. Each time the period of Stage IV sleep decreases and the length of REM sleep increases, until you eventually wake up. At no point does your brain become totally inactive. REM sleep seems to serve psychological functions such as building efficient learning and memory processes.



HOW MUCH SLEEP?

Humans spend approximately one-third of their lives in sleep. The amount of sleep a person needs to function effectively varies considerably from individual to individual and from time to time within a person's life. Newborns spend an average of 16 hours a day sleeping, almost half of it in REM sleep. Sixteen-year-olds may spend as much as 10 to 11 hours asleep each night. Students in graduate school average 8 hours a night.

Men and women who are 70 years old or older may need only 5 hours of sleep. Adults average about 25 percent of their time in REM sleep and 75 percent in NREM sleep. Although the amount of sleep a person needs may vary, it does appear that everyone sleeps and that both types of sleep are important to normal functioning.

Have you ever noticed that there are certain times of the day when you are more alert or more tired? People seem to have an internal biological clock that regulates the sleep-wakefulness cycle. Blood pressure, heart rate, appetite, secretion of hormones and digestive enzymes, sensory sharpness, and elimination processes all follow circadian rhythms (Hrushesky, 1994). A **circadian rhythm** is a biological clock that is genetically programmed to regulate physiological responses within a time period of 24 or 25 hours. Circadian rhythms operate even when normal day and night cues are removed. For example, we usually standardize our sleep patterns according to the light of day and dark of night; yet experimenters who have lived for months at a time in the depths of a cave have still maintained a rhythm to their behaviors. Without any environmental cues, people maintained their circadian rhythms on about a 24- to 25-hour cycle. Researchers have determined

circadian rhythm: the rhythm of activity and inactivity lasting approximately one day



that humans have a circadian cycle of approximately 24.18 hours (Czeisler et al., 1999).

Circadian rhythms do not control our sleep cycles; the environment and the 24-hour day control our cycles. Thus, when you miss sleep, this disruption becomes very apparent. Some travelers experience jet lag. This occurs when their internal circadian rhythms do not match the external clock time. For example, when you travel from New York to Moscow, your body is on a different time clock when you reach Moscow. You may feel tired and disoriented. What do you do to cure jet lag? It usually takes about one day for each hour of time change to reset your circadian clock.

SLEEP DISORDERS

Sleep is an active state essential for mental and physical restoration. Sometimes, though, we may have problems falling asleep or have problems during sleep. These sleep disorders may interfere with our quality of life and personal health, as well as endanger public safety because of their role in industrial or traffic accidents.

Insomnia

Everyone has had a sleepless night at one time or another—a night where nothing you do brings the calm, soothing peace you want. Some people have sleep problems like this all the time, and they rarely get more than an hour or two of uninterrupted sleep a night. **Insomnia**—a prolonged and usually abnormal inability to obtain adequate sleep—has many causes and takes many forms. Some people cannot sleep at night because of anxiety or depression. Overuse of alcohol or drugs can also cause insomnia.

insomnia: the failure to get enough sleep at night in order to feel rested the next day

Sleep Apnea

The sleep disorder **sleep apnea** causes frequent interruptions of breathing during sleep. One of the most common symptoms is a specific kind of snoring that may occur hundreds of times during the night. Each snoring episode lasts 10 to 15 seconds and ends suddenly, often with a physical movement of the entire body. A blockage of the breathing passages actually causes the snoring; during this time the victim is in fact choking—the flow of air to the lungs stops. The episode ends when low levels of oxygen or high levels of carbon dioxide in the blood trigger breathing reflexes.

sleep apnea: a sleep disorder in which a person has trouble breathing while asleep

Sleep apnea affects about 1 in 100 Americans, occurring most often among older people. People suffering from this disorder may feel listless, sleepy, and irritable during the day. Whereas insomnia is caused by mental stress, sleep apnea is usually caused by a physical problem that blocks the airway, such as enlarged tonsils, repeated infections in the throat or middle ear, or obesity. These conditions may cause the muscles at the base of the tongue to relax and sag repeatedly.

narcolepsy: a condition characterized by suddenly falling asleep or feeling very sleepy during the day

nightmares: unpleasant dreams

night terrors: sleep disruptions that occur during Stage IV of sleep, involving screaming, panic, or confusion

sleepwalking: walking or carrying out behaviors while asleep

Narcolepsy

Another disorder, **narcolepsy**, is characterized by a permanent and overwhelming feeling of sleepiness and fatigue. Other symptoms include unusual sleep and dream patterns, such as dreamlike hallucinations or a feeling of temporary paralysis. People with narcolepsy may have sleep attacks throughout the day. The sleep attacks are accompanied by brief periods of REM sleep. Victims of narcolepsy may have difficulties in the area of work, leisure, and interpersonal relations and are prone to accidents.

Nightmares and Night Terrors

Frightening dreams—**nightmares**—occur during the dream phase of REM sleep. A nightmare may frighten the sleeper, who will usually wake up with a vivid memory of a movielike dream. On the other hand, **night terrors** occur during Stage IV sleep (usually within an hour after going to bed). A night terror may last anywhere from five to twenty minutes and involve screaming, sweating, confusion, and a rapid heart rate. The subject may suddenly awake from sleep or have a persistent fear that occurs at night. Subjects usually have no memory of night terrors.

Sleepwalking and Sleep Talking

A disorder in which a person is partly, but not completely, awake during the night is **sleepwalking**. That person may walk or do other things without any memory of doing so. Sleepwalking is a disorder associated with children, although some adults may sleepwalk. Most children who sleepwalk do not have emotional problems and will outgrow it. This disorder has been linked to stress, fatigue, and the use of sedative medicines. Sleepwalking may also be inherited. It is usually harmless; however, it may become dangerous if sleepwalkers fall or otherwise injure themselves—their movements are often clumsy. It is not dangerous to wake sleepwalkers.

Sleep talking is a common sleep disruption. Most people talk in their sleep more than they realize because they do not remember talking during sleep. Sleep talking can occur in either REM or NREM sleep. It can be a single word or a longer speech. Sometimes sleep talkers pause between sentences or phrases as if they are carrying on a conversation with someone else. You can even engage a sleep talker in a conversation sometimes. Like sleepwalking, sleep talking is harmless.

DREAMS

We call the mental activity that takes place during sleep dreaming. Everybody dreams, although most people are able to recall only a few, if any, of their dreams. (However, in cultures in which dreams are highly valued and talked about frequently, people remember their dreams almost every morning.) Sleep researchers sometimes make a point of waking study participants at regular intervals during the night to ask

them about their dreams. The first few dreams are usually composed of vague thoughts left over from the day's activities. A participant may report that she was watching television, for example. As the night wears on, dreams become longer and more vivid and dramatic, especially dreams that take place during REM sleep. Because the amounts of time spent in REM sleep increase during the night, the last dream is likely to be the longest and the one people remember when they wake up. People, however, can rarely recall more than the last 15 minutes of a dream when they are awakened (Dement & Wolpert, 1958). Researchers have found that after people have been deprived of REM sleep, they subsequently increase the amount of time they spend in REM sleep. Thus, it appears that a certain amount of dreaming each night is necessary (Dement, 1976).

The Content of Dreams

When people are awakened randomly during REM sleep and asked what they had just been dreaming, the reports generally are commonplace, even dull (Hall & Van de Castle, 1966). The dreams we remember and talk about “are more coherent, sexier, and generally more interesting” than those collected in systematic research (Webb, 1975).

Often we incorporate our everyday activities into our dreams. Researchers who have recorded the contents of thousands of dreams have found that most—even the late-night REM adventures—occur in such commonplace settings as living rooms, cars, and streets. Most dreams involve either strenuous recreational activities or passive events such as sitting and watching. A large percentage of the emotions experienced in dreams are negative or unpleasant—anxiety, anger, sadness, and so on. Contrary to popular belief, dreams do not occur in a split second; they correspond to a realistic time scale.

Some dreams are negative enough to be considered nightmares. Nightmares often have such a frightening quality that we awaken in the middle of them. The sense of dread in nightmares may be related to the intensity of brain activity and to the stimulation of those parts of the brain responsible for emotional reactions. The emotional reaction of dread may then influence the content of the dream.

Dream Interpretation

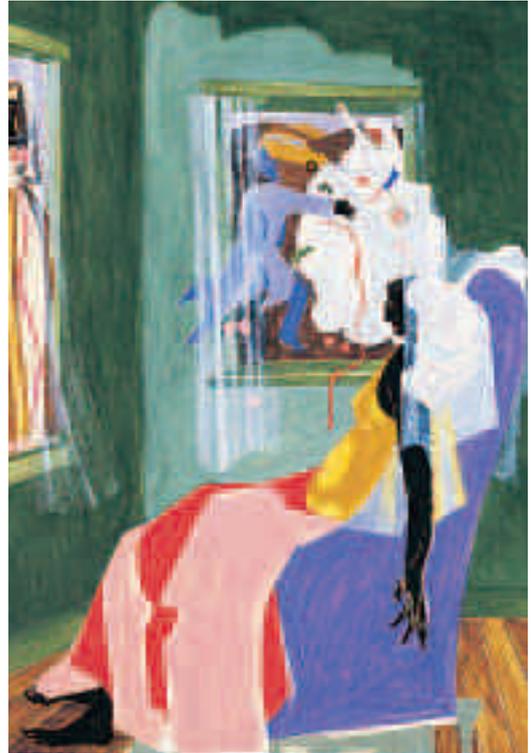
Dream interpretations have been discovered dating back to 5000 B.C. Sigmund Freud believed that no matter how simple or mundane, dreams may contain clues to thoughts the dreamer is afraid to acknowledge in his or her waking hours.

The Inuit people of North America, like Freud, believe that dreams contain hidden meanings. They believe that when dreaming, people enter the

Figure 7.3

The Dream

Some researchers believe that when we sleep, electrical bursts occur that hit portions of the brain, firing off various memory circuits. The result? Dreams. Artist Jacob Lawrence created *Dreams No. 2* in 1965. **What are other explanations for dreaming?**



More About...

Freud on Dreams

Sigmund Freud was the first psychologist to study dreams thoroughly. He hypothesized that dreams express impulses and thoughts, often in highly symbolic form, that are unacceptable at the conscious level. Freud used the term *manifest content* to refer to the story line, images, and other perceptual aspects of dreams. Freud defined *latent content* as the hidden meaning of dreams that comes from the dreamer's unconscious wishes (Freud, 1965).

spiritual world where they interact with those who have passed away. These departed souls help the living reflect on some current or future event (Plotnik, 1999).

Some social scientists, however, are skeptical of dream interpretations. Nathaniel Kleitman, one of the pioneers who discovered REM sleep, wrote in 1960: "Dreaming may serve no function whatsoever." According to this view, the experience of a dream is simply an unimportant by-product of stimulating certain brain cells during sleep. Others argue that the common experience of feeling paralyzed in a dream simply means that brain cells that inhibit muscle activity were randomly stimulated (McCarley, 1978). One dream researcher advocates a problem-solving theory about dreaming (Cartwright, 1993). This theory proposes that dreaming allows people a chance to review and address some of the problems they faced during the day. One theorist, Francis Crick,

believes that dreams are the brain's way of removing certain unneeded memories. In other words, dreams are a form of mental housecleaning. This mental housecleaning may be necessary because it is not useful to remember every single detail of your life.

Daydreams Daydreaming requires a low level of awareness and involves fantasizing, or idle but directed thinking, while we are awake. Usually we daydream when we are in situations that require little attention or when we are bored. Daydreaming serves useful purposes such as reminding us of or preparing us for events in our future. Daydreaming may also improve our creativity by generating thought processes. Some psychologists believe that daydreaming allows us to control our emotions.

SECTION I

Assessment

- 1. Review the Vocabulary** Describe the symptoms of insomnia, sleep apnea, narcolepsy, nightmares, night terrors, and sleepwalking.
- 2. Visualize the Main Idea** Use a flowchart similar to the one below to list and describe the five stages of sleep.
- 3. Recall Information** What is the difference between REM and NREM sleep? Which type lasts longer during a night's sleep?
- 4. Think Critically** Why is sleep characterized as an *altered* state of consciousness? Why do you think we sleep?



- 5. Application Activity** Create a Dream Diary. For one week attempt to remember and record your dreams. Then research Freudian dream analysis and apply this technique to your dreams.

Hypnosis, Biofeedback, and Meditation

Reader's Guide

■ Main Idea

Hypnosis, biofeedback, and meditation are altered states of consciousness that can occur when we are awake.

■ Vocabulary

- hypnosis
- posthypnotic suggestion
- biofeedback
- meditation

■ Objectives

- Determine how hypnosis relates to consciousness.
- Describe research into such techniques as biofeedback and meditation.

EXPLORING PSYCHOLOGY

Not Feeling the Pain

Victor Rausch entered a hypnotic trance by focusing on Chopin's *Lush Nocturne in E-flat*, as it was played in the movie *The Eddy Duchin Story*. Rausch visualized scenes from the movie and wrapped his mind in appealing thoughts. Rausch's blood pressure and pulse rate remained steady for 75 minutes. During this 75 minutes Rausch was undergoing a gallbladder operation! He had refused the anesthetic, and during the surgery, he swears he felt no pain—just a little tugging. He even talked and joked with the surgical team during the procedure. After the surgery, he stood up and walked down the hall, riding the elevator to his hospital room.

—from “The Healing Power of Hypnosis” by Jean Callahan, 1997

Surgery without anesthesia may sound like a trick, but such operations have been performed by hypnotizing the patient. Although hypnosis still conjures up images of a circus magician saying, “You are getting sleepy, very sleepy . . .,” researchers are learning more about this mind-body connection. Doctors and therapists use hypnosis to help people quit smoking, lose weight, manage stress, overcome phobias, and diminish pain.

WHAT IS HYPNOSIS?

So what exactly is hypnosis? **Hypnosis** is a form of altered consciousness in which people become highly suggestible to changes in behavior and thought. By allowing the hypnotist to guide and direct them,

hypnosis: a state of consciousness resulting from a narrowed focus of attention and characterized by heightened suggestibility

Profiles In Psychology



Franz Anton Mesmer

1734–1815

“Truth is nothing but a path traced between errors.”

Franz Anton Mesmer missed the narrow path of truth; he also missed the signs in his path that his science was faulty. Mesmer, however, became the first person to study and practice hypnosis. Mesmer believed that the human body is filled with a magnetic fluid that can become misaligned, causing illness. Realignment would restore health. Mesmer treated medical problems by placing his patients in a tub filled with water and iron filings; large iron rods protruded from the tub. Mesmer would then pass a magnet back and forth across the patient’s body to redirect the flow of the blood, nerve activity, and fluids. Some of his patients reported dramatic results.

Later, Mesmer got rid of the magnet and used his own hand, claiming that he himself was the magnet. He called the force he discharged *animal magnetism*. Before Mesmer treated his patients, he told them to expect certain reactions, and his patients responded as anticipated. After his death, his followers called this healing technique “mesmerism” or “hypnotism.” Although Mesmer was denounced as a fraud, and Mesmer’s magnetic fluid was never proven to exist, he paved the way for studies relating to the readiness of some subjects to obey hypnotic suggestions and enter an altered state of consciousness.

people can be made conscious of things they are usually unaware of and unaware of things they usually notice. Participants may recall in vivid detail incidents they had forgotten or feel no pain when pricked with a needle. It happens in this way: At all times, certain sensations and thoughts are filtered out of our awareness. For example, as you read this sentence, you were probably not aware of the position of your feet until I called attention to that. By mentioning the position of your feet, your attention shifted to your feet—an area of your body that seconds before was outside your consciousness. Hypnosis shifts our perceptions in the same way.

Hypnosis does not put the participant to sleep, as many people believe. A hypnotic trance is quite different from sleep. In fact, participants become highly receptive and responsive to certain internal and external stimuli. They are able to focus their attention on

one tiny aspect of reality and ignore all other inputs. The hypnotist induces a trance by slowly persuading a participant to relax and to lose interest in external distractions. Whether this takes a few minutes or much longer depends on the purpose of the hypnosis, the method of induction, and the participant’s past experiences with hypnosis.

In an environment of trust, a participant with a rich imagination can become susceptible to the hypnotist’s suggestions. Psychologists using hypnosis stress that the relationship between hypnotist and participant should involve cooperation, not domination. The participant is not under the hypnotist’s control but can be convinced to do things he or she would not normally do. The person is simply cooperating with the hypnotist. Together they try to solve a problem or to learn more about

how the participant's mind works. Anyone can resist hypnosis by refusing to open his or her mind to the hypnotist. However, people under hypnosis can be induced to do things against their will. Mutual trust is important for hypnosis to be successful.

Theories of Hypnosis

Psychologists do not agree about the nature of hypnosis. Some, like Theodore Barber (1965), argue that hypnosis is not a special state of consciousness but simply the result of suggestibility. If people are just given instructions and told to try their hardest, they will be able to do anything that hypnotized people can do.

Others, like Ernest Hilgard (1986), believe that there is something special about the hypnotic state. People who are hypnotized are very suggestible; they go along with the hypnotist and do not initiate activities themselves; and they can more easily imagine and remember things. Hilgard believes that consciousness includes many different aspects that may become separated, or dissociated, during hypnosis. This view is called the neodissociation theory, which includes a “hidden observer”—a portion of the personality that watches and reports what happens to the hypnotized person.

Another explanation of hypnosis is based on the importance of suggestibility in the hypnotic induction (Green et al., 1998). According to some theorists (Sarbin & Coe, 1972, 1979), hypnotized people behave as they do because they have accepted the role of a hypnotized subject. We expect that hypnotized individuals will forget certain things when told or will recall forgotten material, and we play the role. Whether hypnosis is a special state of consciousness or not, it does reveal that people often have potential abilities that they do not use. Continued study may help us understand where these abilities come from and how to use them better.

Uses of Hypnosis

Although people have often seen hypnosis as a part of an entertainment act, it has serious uses in medical and therapeutic settings.

Hypnotists can suggest things for their participants to remember or forget when the trance is over. This is known as **posthypnotic suggestion**. For example, the hypnotist can suppress memory by suggesting that after the person is awakened, she will be unable to hear the word *psychology*. When she comes out of the trance, the participant

 **Reading Check**
What type of relationship is needed between a hypnotist and participant?

posthypnotic suggestion: a suggestion made during hypnosis that influences the participant's behavior afterward



Hypnosis and Athletics

Olympic athletes use self-hypnosis to achieve peak performance. Many coaches and trainers realize the power of mental rehearsal before competition begins. Although self-hypnosis cannot turn an average soccer player into a world-class athlete, it can help you achieve your personal best. The next time you need a top performance, apply the following steps. Write a short summary of the event and the usefulness of self-hypnosis.

1. Relax. (If you have prepared physically for the upcoming challenge, relax and think about it.)
2. Set your short-term, specific, and achievable goals. (What is your objective?)
3. Concentrate, eliminate distractions, and visualize a peak performance.
4. Design a plan of action and mentally rehearse it by visualizing yourself performing to perfection.

Can you hypnotize yourself?

Sometimes just thinking of an action can result in producing that action—if you can imagine that action clearly enough.

Procedure

1. Stretch your arms in front of you, making sure the palms are facing each other at the same height and about two inches apart.
2. Close your eyes. Imagine that your right arm is getting heavier and heavier, while your left arm is getting lighter and lighter.
3. To help yourself, imagine that your right hand is holding a strap wrapped around several heavy books, while your left hand is holding a string tied to a helium balloon.

Analysis

1. After about a minute, open your eyes and see how far your hands have actually moved. Are they one or two inches or several inches apart?
2. Using what you have learned about hypnosis, explain the results in a brief report.



See the **Skills Handbook**, page 622, for an explanation of designing an experiment.

biofeedback: the process of learning to control bodily states with the help of machines monitoring the states to be controlled

may report that some people around her are speaking strangely. They seem to leave out some words occasionally, especially when they are talking about topics involving the taboo word *psychology*. The participant is not aware that part of her consciousness has been instructed to block out that word. Memory can also be aided or enhanced through posthypnotic suggestion. Posthypnotic suggestion has been found to be particularly helpful in changing unwanted behaviors, such as smoking or overeating.

Hypnosis is sometimes used to reduce pain. *Hypnotic analgesia* refers to a reduction of pain reported by patients after they had undergone hypnosis. In these situations, the hypnotist works with the patient to reduce his or her anxiety and encourage relaxation. Therefore, a patient's perception of pain is reduced.

Therapists use hypnosis to help clients reveal their problems or gain insight into their lives. For example, hypnotherapists use hypnosis to allow their patients to think of their problems in a new way. Hypnosis, though, is not for all patients. Some fear the loss of control associated with hypnosis. Therapists often combine hypnosis with other therapies to help patients work through their problems.

BIOFEEDBACK

A technique in which a person learns to control his or her internal physiological processes with the help of feedback is **biofeedback**. For example, you can be hooked up to a biofeedback machine so that a light goes on every time your heart rate goes over 80. You could then learn to keep your heart rate below 80 by trying to keep the light off.

Biofeedback has been used to teach people to control a wide variety of physiological responses, including brain waves (EEG), heart rate, blood pressure, skin temperature, and sweat-gland activity (Hassett, 1978a). The basic principle of biofeedback is simple: feedback makes learning possible.

Biofeedback involves using machines to tell people about very subtle, moment-to-moment changes in the body. People can then experiment with different thoughts and feelings while they watch how each affects their bodies. In time, people can learn to change their physiological processes.

Some of the best-documented biofeedback cures involve special training in muscular control. Tension headaches often seem to result from constriction of the frontalis muscle in the forehead. Thomas Budzynski and others (1973) used biofeedback to teach people to relax this specific muscle. The practice went on for several weeks, while other people were

given similar treatments without biofeedback. Only the biofeedback group improved significantly. Biofeedback used without drugs seems to help many people.

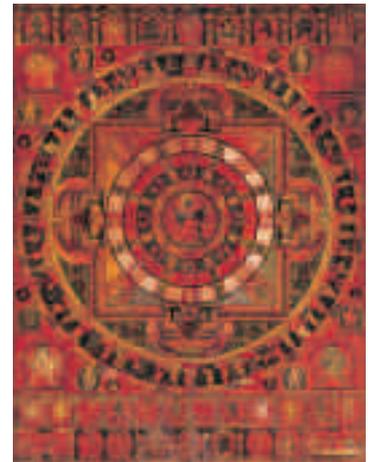
MEDITATION

When a person focuses his or her attention on an image or thought with the goal of clearing the mind and producing relaxation, or an inner peace, that person is practicing **meditation**. Meditation has been practiced in various parts of the world for thousands of years.

There are three major approaches to meditation. *Transcendental meditation* involves the mental repetition of a mantra, usually a Sanskrit phrase. The participant sits with eyes closed and meditates for 15 to 20 minutes twice a day. *Mindfulness meditation* was developed from a Buddhist tradition. This form of meditation focuses on the present moment. For example, the participant may move his or her focus through the body from the tips of the toes to the top of the head, while paying particular attention to areas that cause pain. *Breath meditation* is a concentration on one's respiration—the process of inhaling and exhaling.

Researchers generally agree that most people can benefit from the sort of systematic relaxation that meditation provides. Meditation has been found to help people lower blood pressure, heart rate, and respiration rate. The issue is not clear-cut, however. The people who benefit from meditation continue to practice it. Thus, the reported benefits may come from a biased, self-selected sample of successful practitioners. Other data suggest that while meditating, some people may actually be sleeping. If so, the reported benefits of meditation may result simply from relaxation.

meditation: the focusing of attention to clear one's mind and produce relaxation



A mandala is used to focus one's attention during meditation.

SECTION 2 Assessment

- 1. Review the Vocabulary** Explain how a person can alter his or her consciousness by using meditation.
- 2. Visualize the Main Idea** Using a diagram similar to the one below, list some explanations of hypnosis.
- 3. Recall Information** What types of medical conditions could be helped through biofeedback?
- 4. Think Critically** Why is it so important that the person being hypnotized trust his or her hypnotist?

Explanations of Hypnosis		
1.	2.	3.

- 3. Recall Information** What types of medical conditions could be helped through biofeedback?

5. Application Activity Try this meditation technique: (1) Take a few moments and form your lips into a half smile; (2) Hold this half smile for at least 10 minutes as you go about your ordinary activities. Did you notice a shift in how you acted and responded to others? Did others respond to you differently? Record and analyze your experiences.

Case Studies

A Breath of Fresh Air

Period of Study: Late 1970s to early 1980s

Introduction: Approximately 13 million people in the United States suffer from a chronic respiratory condition characterized by hypersensitivity, inflammation, and obstruction or narrowing of the airways. This condition is commonly known as asthma. An asthmatic person develops swollen airways lined with thick mucus. This causes the surrounding muscles to constrict, making it extremely difficult to breathe and sometimes leading to a life-threatening event. The occurrence of these symptoms is known as an asthmatic episode.

The causes of asthma are generally the results of allergic reactions, stress, endocrine changes, genetic makeup, and/or psychological traits. Those afflicted with asthma suffer from both gasping and irritating interruptions of their daily routine. Asthmatic individuals who choose to participate in aerobic sports of any kind must constantly monitor their breathing patterns. They must always be prepared to manage an oncoming episode.

For the past decade, medication in the form of an oral inhaler was the common way to treat an asthmatic episode. Researchers, however, are currently investigating a possible connection between halting an asthmatic episode and the use of biofeedback.

Hypothesis: Through the use of biofeedback, or gaining conscious control over an unconscious event, an asthma sufferer can gain control and relieve the tightening of the muscles that constrict airways.

Method: Recent studies have attempted to find the relationship between changes in muscular tension and breathing

patterns in both asthmatic and nonasthmatic individuals. Researchers instructed participants to use deep breathing exercises while hooked up to biofeedback monitors. This allowed the participants to learn to control their heart rates during breathing cycles. The goal of this experiment was to control the muscle reflex that constricts airways during an asthmatic episode. Other types of biofeedback experiments were performed as well. No biofeedback machine was used for these experiments; instead, an important biofeedback “monitor”—a mirror—was used.

The participant would perform the same type of breathing exercises in front of the mirror, thus monitoring muscle tension.

Results: Initial observation showed that the performance of these types of exercises might decrease asthma symptoms. Participants took

lower dosages of medication, sometimes eliminating the medication entirely. Emergency room visits by participants involving asthmatic episodes decreased significantly. Overall, the benefits of biofeedback techniques used to control asthma are apparent. A number of questions regarding biofeedback techniques and asthma, however, remain unanswered. One such question involves researching long-term effects of these techniques. Because this research is relatively new, such questions may not be answered for years to come. These studies, though, may be the foundation for future therapies such as biofeedback to control migraine headaches, speech disorders, and blood pressure.



Analyzing the Case Study

1. What causes asthma?
2. Describe how participants monitored their physiological processes in the experiments.
3. **Critical Thinking** How did participants use biofeedback in the experiments? Why was it successful?

Reader's Guide

■ **Main Idea**

Psychoactive drugs interact with the central nervous system to alter consciousness.

■ **Vocabulary**

- psychoactive drugs
- marijuana
- hallucinations
- hallucinogens
- LSD

■ **Objectives**

- Describe the effects drugs have on consciousness.
- Define drug abuse.

EXPLORING PSYCHOLOGY

A Letter to Parents

Marijuana is the illegal drug most often used in this country. Since 1991, lifetime marijuana use has doubled among 8th- and 10th-grade students, and increased by a third among high school seniors. Our research shows that accompanying this upward pattern of use is a significant erosion in antidrug perceptions and knowledge among young people today. As the number of young people who use marijuana has increased, the number who view the drug as harmful has decreased. Among high school seniors surveyed in 1997, current marijuana use has increased by about 72 percent since 1991. The proportion of those seniors who believe regular use of marijuana is harmful has dropped by about 26 percent since 1991.

—from “Marijuana: Facts Parents Need to Know” by the National Institute on Drug Abuse, 1998

Marijuana use today starts at a young age, and potent forms of the drug are available. The National Institute on Drug Abuse (NIDA) warned parents in the letter above that marijuana is a serious threat—which they must talk to their children about. Marijuana is an example of a psychoactive drug. **Psychoactive drugs** interact with the central nervous system to alter a person's mood, perception, and behavior. These drugs range from stimulants like the caffeine in coffee and in cola drinks to depressants like alcohol to powerful hallucinogens like marijuana and LSD (see Figure 7.4).

psychoactive drugs: chemicals that affect the nervous system and result in altered consciousness

HOW DRUGS WORK

Like hormones, drugs are carried by the blood and taken up in target tissues in various parts of the body. Unlike hormones, though, drugs are taken into the body from the outside. People introduce drugs into their systems through routes that bring the drugs into contact with capillaries (the smallest blood vessels). From there, drugs are gradually absorbed into the blood. Then drug molecules act like neurotransmitters and hook onto the ends of nerve cells (neurons) and send out their own chemical messages. For example, alcohol molecules may tell a nerve cell not to fire. As more and more cells cease firing, the alcohol user becomes slower and may eventually lose consciousness. LSD molecules may cause circuits in different areas of the brain to start firing together instead of separately, resulting in hallucinations.

MARIJUANA

marijuana: the dried leaves and flowers of Indian hemp (*Cannabis sativa*) that produce an altered state of consciousness when smoked or ingested

Used as an intoxicant among Eastern cultures for centuries, **marijuana** is legally and morally acceptable in some societies, whereas alcohol is not. The sale and possession of marijuana is against the law in most states. Before 1960, marijuana use in the United States was common only

Figure 7.4 Some Psychoactive Drugs

Psychoactive drugs influence how we sense and perceive things and modify our moods, feelings, emotions, and thoughts. *What effects do depressants produce?*

Drug Category	Effects on Behavior
Depressants Alcohol	Relaxant; relieve inhibitions; impair memory and judgment
Tranquilizers Barbiturates, benzodiazepines (Valium, Xanax)	Relieve anxiety; relax muscles; induce sleep
Opiates Morphine, heroin	Decrease pain; decrease attention to real world; unpleasant withdrawal effects as drug's effect wears off
Stimulants Caffeine, amphetamines, cocaine	Increase energy, alertness
Mixed Stimulant-Depressants Nicotine	Stimulate brain activity, but most smokers say cigarettes relax them
Distortion of Experience Marijuana (THC)	Intensifies sensory experiences; distorts perception of time; can relieve glaucoma, nausea; sometimes impairs learning, memory
Hallucinogens LSD, mescaline	Cause hallucinations, sensory distortions, and occasionally panic

among members of certain subcultures. Marijuana use increased throughout the 1960s and most of the 1970s but then began to decline.

The active ingredient in marijuana is a complex molecule called tetrahydrocannabinol (THC), which occurs naturally in the common weed *Cannabis sativa*, or Indian hemp. Marijuana is made by drying the plant; hashish is a gummy powder made from the resin exuded by the flowering tops of the female plant. Both marijuana and hashish are usually smoked, but they can also be cooked with food and eaten.

The effects of the drug vary somewhat from person to person and also seem to depend on the setting in which the drug is taken and the user's past experience. The effects can be both pleasant and unpleasant. In general, though, many marijuana users report most sensory experiences seem greatly augmented—music sounds fuller, colors look brighter, smells are stronger, foods have stronger flavors, and other experiences are more intense than usual. Users may feel elated, the world may seem somehow more meaningful, and even the most ordinary events may take on an extraordinary significance. Marijuana is not a physically addictive drug, as heroin is, but people may become psychologically addicted, or dependent on the drug.

As many users of marijuana have discovered, the drug can instill or heighten a variety of unpleasant experiences. If a person is frightened, unhappy, or depressed to begin with, the chances are good that taking the drug will blow the negative feelings out of proportion so that the user's world, temporarily at least, becomes very upsetting. Cases have been reported in which marijuana appears to have helped bring on psychological disturbances in people who were already unstable before they used it.

Despite the obvious need for careful research on marijuana, the first controlled scientific studies of its effects did not appear until the late 1960s, scarcely anticipating its surge in popularity. Studies suggest that marijuana use is more damaging to the lungs than cigarette use. Although there is no direct evidence that marijuana use causes lung cancer, the tar and other chemicals in marijuana smoke are drawn deep into the lungs and held 20 to 40 seconds, adding to the drug's potential for hindering lung function (Ray & Ksir, 1993).

Marijuana also disrupts memory formation, making it difficult to carry out mental and physical tasks (Lictman, Dimen, & Martin, 1995; Pope & Yurgelun-Todd, 1996). Some researchers believe that long-term use of the drug can lead to dependence (Stephens, Roffman, & Simpson, 1994). Research also showed that adults using marijuana scored lower than equal-IQ nonusers on a twelfth-grade academic achievement test (Block & Ghoneim, 1993).

HALLUCINATIONS

Perceptions that have no direct external cause—seeing, hearing, smelling, tasting, or feeling things that do not exist—are **hallucinations**. Hypnosis, meditation, certain drugs, withdrawal from a drug to which

PSYCHOLOGY
Online

Student Web Activity
Visit the *Understanding Psychology* Web site at psychology.glencoe.com and click on **Chapter 7—Student Web Activities** for an activity about altered states of consciousness.



 **Reading Check**
How does marijuana use change a person's consciousness?

hallucinations: perceptions that have no direct external cause



one has become addicted, and psychological breakdown may produce hallucinations. Hallucinations can also occur under normal conditions. People hallucinate when they are dreaming and when they are deprived of the opportunity to sleep. Periods of high emotion, concentration, or fatigue may also produce false sensations and perceptions. For example, truck drivers on long hauls have been known to swerve suddenly to avoid stalled cars that do not exist. Even daydreams involve mild hallucinations.

Interestingly enough, it seems that hallucinations are very much alike from one person to the next. Soon after taking a drug that causes hallucinations, for example, people often see many geometric forms in a tunnel-like perspective. These forms float through the field of vision, combining with each other and duplicating themselves. While normal imagery is often in black and white, hallucinations are more likely to involve color.

One researcher (Seigel, 1977) traveled to Mexico's Sierra Madre to study the reactions of Huichol Native Americans who take peyote. He found that their hallucinations were much like those of American college students who took similar drugs. He believes that these reactions are similar because of the way such drugs affect the brain: portions of the brain that respond to incoming stimuli become disorganized, while the entire central nervous system is aroused.

hallucinogens: drugs that often produce hallucinations

LSD: a potent psychedelic drug that produces distortions of perception and thought

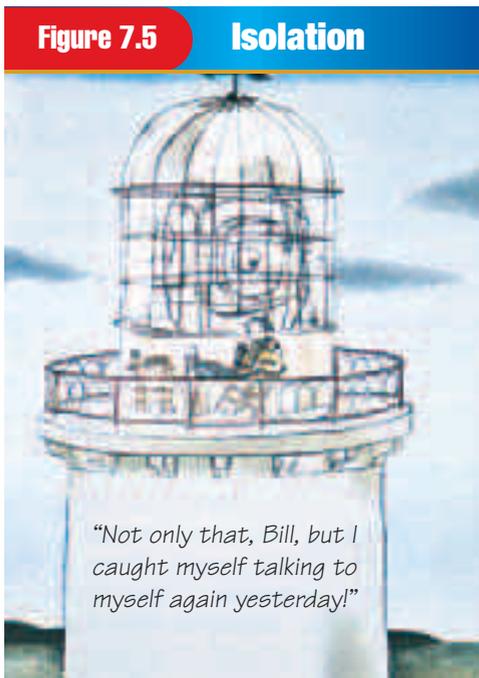


Figure 7.5

Isolation

In this cartoon by Roland B. Wilson, the lighthouse keeper has apparently become a little disturbed psychologically by his isolated life. His unconscious has produced a hallucinatory companion. **What causes hallucinations?**

HALLUCINOGENS

So called because their main effect is to produce hallucinations, **hallucinogens** are found in plants that grow throughout the world. They have been used for their effects on consciousness since earliest human history (Schultes, 1976). These drugs are also called psychedelics because they create a loss of contact with reality. They can create a false body image and cause loss of self, dreamlike fantasies, and hallucinations.

The best-known, most extensively studied, and most potent hallucinogen is **LSD** (lysergic acid diethylamide). In fact, it is one of the most powerful drugs known. LSD is a synthetic substance. A dose of a few millionths of a gram has a noticeable effect; an average dose of 100 to 300 micrograms produces an experiential state, called a trip, that lasts from 6 to 14 hours. To control such small doses, LSD is often dissolved into strips of paper or sugar cubes.

During an LSD trip, a person can experience any number of perceptions, often quite intense and rapidly changing. The person's expectations, mood, beliefs, and the circumstances under which he or she takes LSD can affect the experience, sometimes making it terrifying. Perceptual hallucinations are very common with LSD. Users may experience hallucinatory progressions in which simple geometric forms evolve into surrealistic impossibilities. The user may encounter such distortions that familiar objects become almost unrecognizable. A wall, for example, may seem to pulsate or breathe. One's

senses, too, seem to intermingle; sounds may be seen and visual stimuli may be heard. A person may experience a dissociation of the self into one being who observes and another who feels. Distortions of time, either an acceleration or a slowing down, are also common. A single stimulus may become the focus of attention for hours, perceived as ever changing or newly beautiful and fascinating.

As measured by the ability to perform simple tasks, LSD impairs thinking, even though users may feel they are thinking more clearly and logically than ever before. Panic reactions are the most common of LSD's unpleasant side effects. Those who experience panic and later describe it often say that they felt trapped in the experience of panic and were afraid that they would never get out or that they would go mad. Use of LSD peaked in the 1960s. The likelihood of *flashback* experiences, even months after taking LSD, and public fears of chromosome damage—not confirmed by subsequent research—probably led to LSD's declining popularity (Ray & Ksir, 2002).



Figure 7.6

Just Say No

Many advertisements and programs aimed at kids, such as this one, warn of the dangers involved with drug use. **What is the general treatment for those who abuse drugs?**

OPIATES

Opiates, usually called narcotics, include opium, morphine, and heroin. Opiates produce analgesia, or pain reduction; euphoria, which is sometimes described as a pleasurable state somewhere between wake and sleep; and constipation. Regular use of opiates can lead to physical addiction. An overdose of opiates results in a loss of control of breathing—the user then dies from respiratory failure.

ALCOHOL

The most widely used and abused mind-altering substance in the United States is alcohol. The consumption of alcohol is encouraged by advertisements and by social expectations and traditions. The immediate effect of alcohol is a general loosening of inhibitions. Despite its seeming stimulating effect, alcohol is actually a depressant that serves to inhibit the brain's normal functions. When people drink, they often act without the social restraint or self-control they normally apply to their behavior.

The effects of using alcohol depend on the amount and frequency of drinking and the drinker's body weight. As the amount consumed increases within a specific time, the drinker's ability to function diminishes. The person experiences slurred speech, blurred vision, and impaired judgment and memory. Permanent brain and liver damage and a change in personality can result from prolonged heavy use of alcohol.

Reading Check
How do hallucinogens and alcohol affect a person's consciousness?

Several studies suggested that not all of the early effects of drinking are the result of the alcohol alone; some are social effects. People expect to feel a certain way when they drink. In one study, men who were led to believe they were drinking alcohol when they were, in fact, drinking tonic water became more aggressive. They also felt more sexually aroused and were less anxious in social situations (Marlatt & Rohsenow, 1981).

DRUG ABUSE AND TREATMENT

Almost all of us have taken a psychoactive drug at some time—it may have been caffeine in a soda or a cup of tea. So at what point do we cross the line into drug abuse? Drug abusers are people who regularly use illegal drugs or excessively use legal drugs.

People abuse drugs for many reasons, such as to avoid boredom, to fit in with peers, to gain more self-confidence, to forget about problems, to relax, or simply to feel good. All of these reasons involve changing how people feel.

There are many risks associated with drug abuse, including danger of death or injury by overdose or accident, damage to health, legal consequences, and destructive behavior. The greatest risk associated with the abuse of psychoactive drugs, though, is loss of control. Although addiction does not occur immediately or automatically, drug abuse can turn into addiction—an overwhelming and compulsive desire to obtain and use drugs. Treatment for drug abuse usually involves the following steps:

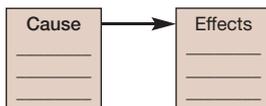
1. The drug abuser must admit that he or she has a problem.
2. The drug abuser must enter a treatment program and/or get therapy.
3. The drug abuser must remain drug free. Many drug addicts are encouraged to join support groups to help them reduce drug use and fight off the temptation of returning to drugs. Many drug addicts suffer a relapse; that is, they return to using drugs. Support groups can be a powerful force in preventing that occurrence.

SECTION 3

Assessment

1. Review the Vocabulary How do psychoactive drugs affect consciousness? Describe the effects of marijuana and LSD.

2. Visualize the Main Idea Using a cause-and-effect diagram similar to the one below, describe the effects of three drugs on consciousness.



3. Recall Information When does drug use become drug abuse? Why do people abuse drugs?

4. Think Critically Do people use psychoactive drugs to increase or decrease their level of awareness? Explain.

5. Application Activity Design an antidrug advertisement for a billboard or magazine. Keep in mind the reasons people choose to abuse drugs when creating your ad.

Everything you think and feel is part of your conscious experience. An altered state of consciousness involves a change in mental processes, not just a quantitative shift (such as feeling more or less alert).

Section 1 Sleep and Dreams

Main Idea: Sleep—an essential state of consciousness—involves stages and periods of dreaming.

- Some researchers believe that sleep is restorative. Others believe sleep is a type of hibernation, necessary to conserve energy. Still others believe sleep clears the mind of useless information.
- There are several stages of sleep—from Stage I, the lightest level of sleep, to Stage IV, the deepest level of sleep. REM sleep is an active type of sleep characterized by rapid eye movement.
- Sometimes people have problems falling asleep or during sleep. Sleep disorders include insomnia, sleep apnea, narcolepsy, nightmares, night terrors, and sleepwalking.
- The mental activity that takes place during sleep is called dreaming.

Section 2 Hypnosis, Biofeedback, and Meditation

Main Idea: Hypnosis, biofeedback, and meditation are altered states of consciousness that can occur when we are awake.

- Hypnosis is a form of altered consciousness in which people become highly suggestible to changes in behavior and thought.
- Biofeedback has been used to teach people to control a wide variety of physiological responses.
- Studies have suggested that the regular practice of meditation is physically relaxing and can also lead to changes in behavior. Others argue that meditation is indistinguishable from regularly scheduled relaxation.

Section 3 Drugs and Consciousness

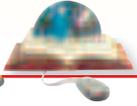
Main Idea: Psychoactive drugs interact with the central nervous system to alter consciousness.

- The effects of marijuana, a psychoactive drug, vary from person to person.
- Hallucinogens, whose main effect is to produce hallucinations, have been used for their effects on consciousness since earliest human history.
- LSD, a synthetic substance, is the most potent and most extensively studied hallucinogen.
- Alcohol is a depressant that serves to inhibit the brain's normal functions.
- Drug abusers are people who regularly use illegal drugs or excessively use legal drugs.

Chapter Vocabulary

consciousness (p. 183)
 REM sleep (p. 186)
 circadian rhythm (p. 186)
 insomnia (p. 187)
 sleep apnea (p. 187)
 narcolepsy (p. 188)
 nightmares (p. 188)
 night terrors (p. 188)
 sleepwalking (p. 188)
 hypnosis (p. 191)
 posthypnotic suggestion (p. 193)
 biofeedback (p. 194)
 meditation (p. 195)
 psychoactive drugs (p. 197)
 marijuana (p. 198)
 hallucinations (p. 199)
 hallucinogens (p. 200)
 LSD (p. 200)

PSYCHOLOGY Online



Self-Check Quiz

Visit the *Understanding Psychology* Web site at psychology.glencoe.com and click on **Chapter 7—Self-Check Quizzes** to prepare for the Chapter Test.

CLICK HERE

Reviewing Vocabulary

Choose the letter of the correct term or concept below to complete the sentence.

- | | |
|------------------|----------------------|
| a. consciousness | f. biofeedback |
| b. insomnia | g. meditation |
| c. sleep apnea | h. psychoactive drug |
| d. narcolepsy | i. hallucinations |
| e. hypnosis | j. hallucinogens |
- _____ is a form of altered consciousness in which people become highly suggestible.
 - Marijuana is an example of a(n) _____, a drug that interacts with the central nervous system to alter a person's mood, perception, and behavior.
 - A prolonged and usually abnormal inability to obtain adequate sleep is called _____.
 - A person who focuses his or her attention on an image or thought with the goal of clearing the mind and producing relaxation is practicing _____.
 - A person's state of awareness is _____.
 - Substances such as LSD are called _____ because their main effect is to produce hallucinations.
 - A technique in which a person learns to control his or her internal physiological processes with the help of special machines is called _____.
 - A permanent and overwhelming feeling of sleepiness and fatigue is called _____.
 - _____ are perceptions that have no direct external cause.
 - _____ is a sleep disorder caused by a physical problem and results in frequent interruptions of breathing during sleep.

Recalling Facts

- What percentage of sleep time do adults usually spend in REM sleep?
- Using a chart similar to the one below, identify and describe six sleep disorders.

Sleep Disorder	Characteristics

- Explain the phenomenon of posthypnotic suggestion.
- List some health problems that biofeedback can potentially help.
- What is the most widely used and abused mind-altering substance in the United States? How does it affect the user?

Critical Thinking

- Analyzing Concepts** Choose a behavior that you perform automatically and pay close attention to how you perform it. How does consciously thinking about the behavior affect your performance of it?
- Demonstrating Reasoned Judgment** Social scientists have varying ideas about the purpose and meaning of dreams. Review the various theories of social scientists presented in this chapter. Whose theory do you agree with the most? Why?
- Making Inferences** Do you think you could be hypnotized? Why or why not?
- Synthesizing Information** Have you ever hallucinated a sight or sound—perhaps when you were very tired or upset? What did you experience? Why do you suppose you created this particular hallucination?
- Making Comparisons** Look through magazines to find advertisements for alcoholic beverages. How do the ways that the advertisements portray drinking alcohol compare to the realities of drinking alcohol?

Psychology Projects

- 1. Sleep and Dreams** Interview members of your family and friends to find out how many hours a night they sleep. Note their responses; then, as a class, record the results in a bar graph. What kinds of sleep patterns—in terms of age and gender—do you observe? Present your findings to the class in an oral report.
- 2. Meditation** Meditation is an important part of some religions, such as Buddhism and Hinduism. Find out about the purpose of meditation in these religions and present your findings in a written report.
- 3. Drugs and Consciousness** Research places in your community where a drug abuser can go for help. Locate the address, phone number, and the types of services offered in each place. Compile your findings in an informational pamphlet.
- 4. Hypnosis** Contact a hypnotherapist and a stage hypnotist. Ask both: Is hypnosis an altered state of consciousness? What is the difference between a person's usual waking state and a hypnotic state? Do participants voluntarily agree to the hypnotist's suggestions? What applications of

hypnosis do you recommend to people? Ask other questions to compare their views and uses of hypnosis. Report your findings to the class.



Technology Activity

Search the Internet to find out about various meditation techniques. Enter the term *meditation* to obtain a list of sites that actually provide techniques you can use to meditate. Try one or two of the techniques and report on their effectiveness to the class.



Psychology Journal

Many psychologists have theorized that by interpreting the content of our dreams, we can better understand our unconscious desires. Other social scientists have maintained a more commonplace view of dreams. Write a two-page essay in your journal that presents a case for both viewpoints. You may want to look for recent magazine articles on dreams. If possible, use a recent dream that you remember as an example to support one of the viewpoints.

Building Skills

Analyzing a Chart Review the chart below, then answer the questions that follow.

Year	Total			
	Total	School	Home	Party
1976	82.6	12.1	53.0	72.3
1978	86.7	12.2	55.8	76.1
1980	86.5	13.4	57.0	75.3
1982	85.6	10.1	54.6	74.9
1984	82.5	11.3	51.6	71.9
1986	84.2	10.9	49.8	72.4
1988	85.2	10.2	52.1	73.8
1990	79.0	6.6	42.9	68.3
1992	76.8	6.7	40.0	66.0
1994	74.3	7.8	39.9	63.3
1996	71.3	8.1	37.8	60.8

Note: "School" was not defined for the questionnaire respondent. Population sizes are not available.
Source: University of Michigan, Survey Research Center, Institute for Social Research, Monitoring the Future Study, 1976 to 1996.



Practice and assess key social studies skills with **Glencoe Skillbuilder Interactive Workbook CD-ROM, Level 2.**

1. According to the table, where does most drinking by high school seniors take place? Why do you think this is so?
2. In what year was alcohol use at its highest among high school seniors?
3. In what year was alcohol use at its lowest among high school seniors?
4. How has the number of seniors who used alcohol changed between 1976 and 1996? What factors might account for this fact?



See the **Skills Handbook**, page 628, for an explanation of interpreting charts.