choose a brand that had the letters of their own name. Specifically, the participants all wrote about an aspect of themselves that they would like to change.

After the teas were ready, the participants tasted them and then chose to take a packet of one of the teas home with them. After they made their choice, the participants were asked why they chose the tea they had chosen, and then the true purpose of the study was explained to them.

The results of this study found that participants chose the tea that included the first three letters of their own name significantly more frequently (64% of the time) than they chose the tea that included the first three letters of their partner's name (only 36% of the time). Furthermore, the decisions were made unconsciously; the participants did not know why they chose the tea they chose. When they were asked, more than 90% of the participants thought that they had chosen on the basis of taste, whereas only 5% of them mentioned the real cause—that the brand name contained the letters of their name.

Once we learn about the outcome of a given event (e.g., when we read about the results of a research project), we frequently believe that we would have been able to predict the outcome ahead of time. For instance, if half of a class of students is told that research concerning attraction between people has demonstrated that "opposites attract" and the other half is told that research has demonstrated that "birds of a feather flock together," most of the students will report believing that the outcome that they just read about is true, and that they would have predicted the outcome before they had read about it. Of course, both of these contradictory outcomes cannot be true. (In fact, psychological research finds that "birds of a feather flock together" is generally the case.) The problem is that just reading a description of research findings leads us to think of the many cases we know that support the findings, and thus makes them seem believable. *The tendency to think that we could have predicted something that has already occurred that we probably would not have been able to predict* is called the hindsight bias.

basis of further research, turn out to be partially or even entirely incorrect. Although scientific procedures do not necessarily guarantee that the answers to questions will be objective and unbiased, science is still the best method for drawing objective conclusions about the world around us. When old facts are discarded, they are replaced with new facts based on newer and more correct data. Although science is not perfect, the requirements of empiricism and objectivity result in a much greater chance of producing an accurate understanding of human behavior than is available through other approaches.

Levels of Explanation in Psychology

The study of psychology spans many different topics at many different levels of explanation, which are *the perspectives that are used to understand behavior*. Lower levels of explanation are more closely tied to biological influences, such as genes, neurons, neurotransmitters, and hormones, whereas the middle levels of explanation refer to the abilities and characteristics of individual people, and the highest levels of explanation relate to social groups, organizations, and cultures (Cacioppo, Berntson, Sheridan, & McClintock, 2000). [7]

The same topic can be studied within psychology at different levels of explanation, as shown in Figure 1.3 "Levels of Explanation". For instance, the psychological disorder known as *depression* affects millions of people worldwide and is known to be caused by biological, social, and cultural factors. Studying and helping alleviate depression can be accomplished at low levels of explanation by investigating how chemicals in the brain influence the experience of depression. This approach has allowed psychologists to develop and prescribe drugs, such as Prozac, which may decrease depression in many individuals (Williams, Simpson, Simpson, & Nahas, 2009). [8] At the middle levels of explanation, psychological therapy is directed at helping individuals cope with negative life experiences that may cause depression. And at the highest level, psychologists study differences in the prevalence of depression between men and women and across cultures. The occurrence of psychological disorders, including depression, is substantially higher for women than for men, and it is also higher in Western cultures, such as in the United States, Canada, and Europe, than in Eastern cultures, such as in India, China, and

Frederic Bartlett (1886–1969), who studied the cognitive and social processes of remembering. Bartlett created short stories that were in some ways logical but also contained some very unusual and unexpected events. Bartlett discovered that people found it very difficult to recall the stories exactly, even after being allowed to study them repeatedly, and he hypothesized that the stories were difficult to remember because they did not fit the participants' expectations about how stories should go. The idea that our memory is influenced by what we already know was also a major idea behind the cognitive-developmental stage model of Swiss psychologist Jean Piaget (1896–1980). Other important cognitive psychologists include Donald E. Broadbent (1926–1993), Daniel Kahneman (1934–), George Miller (1920–), Eleanor Rosch (1938–), and Amos Tversky (1937–1996).

The War of the Ghosts

The War of the Ghosts was a story used by Sir Frederic Bartlett to test the influence of prior expectations on memory. Bartlett found that even when his British research participants were allowed to read the story many times they still could not remember it well, and he believed this was because it did not fit with their prior knowledge.

> *One night two young men from Egulac went down to the river to hunt seals, and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party." They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:*
>
> *"What do you think? We wish to take you along. We are going up the river to make war on the people."*
>
> *One of the young men said, "I have no arrows."*
>
> *"Arrows are in the canoe," they said.*
>
> *"I will not go along. I might be killed. My relatives do not know where I have gone. But you," he said, turning to the other, "may go with them."*
>
> *So one of the young men went, but the other returned home.*
>
> *And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water and they began to fight, and many were killed. But presently the young man heard one of the warriors*

Our ability to adequately assess our own knowledge is known as *metacognition*. Research suggests that our metacognition may make us overconfident, leading us to believe that we have learned material even when we have not. To counteract this problem, don't just go over your notes again and again. Instead, make a list of questions and then see if you can answer them. Study the information again and then test yourself again after a few minutes. If you made any mistakes, study again. Then wait for a half hour and test yourself again. Then test again after 1 day and after 2 days. Testing yourself by attempting to retrieve information in an active manner is better than simply studying the material because it will help you determine if you really know it.

In summary, everyone can learn to learn better. Learning is an important skill, and following the previously mentioned guidelines will likely help you learn better.

KEY TAKEAWAYS

- The first psychologists were philosophers, but the field became more empirical and objective as more sophisticated scientific approaches were developed and employed.
- Some basic questions asked by psychologists include those about nature versus nurture, free will versus determinism, accuracy versus inaccuracy, and conscious versus unconscious processing.
- The structuralists attempted to analyze the nature of consciousness using introspection.
- The functionalists based their ideas on the work of Darwin, and their approaches led to the field of evolutionary psychology.
- The behaviorists explained behavior in terms of stimulus, response, and reinforcement, while denying the presence of free will.
- Cognitive psychologists study how people perceive, process, and remember information.
- Psychodynamic psychology focuses on unconscious drives and the potential to improve lives through psychoanalysis and psychotherapy.
- The social-cultural approach focuses on the social situation, including how cultures and social norms influence our behavior.

EXERCISES AND CRITICAL THINKING

[26] Yang, Y.-J., & Chiu, C.-Y. (2009). Mapping the structure and dynamics of psychological knowledge: Forty years of APA journal citations (1970–2009). *Review of General Psychology, 13*(4), 349–356.

[27] Gold, P. E., Cahill, L., & Wenk, G. L. (2002). Ginkgo biloba: A cognitive enhancer?*Psychological Science in the Public Interest, 3*(1), 2–11; McDaniel, M. A., Maier, S. F., & Einstein, G. O. (2002). "Brain-specific" nutrients: A memory cure? *Psychological Science in the Public Interest, 3*(1), 12–38.

[28] Rogers, T. B., Kuiper, N. A., & Kirker, W. S. (1977). Self-reference and the encoding of personal information. *Journal of Personality & Social Psychology, 35*(9), 677–688.

[29] Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science, 15*(5), 265–268

1.3 Chapter Summary

Psychology is the scientific study of mind and behavior. Most psychologists work in research laboratories, hospitals, and other field settings where they study the behavior of humans and animals. Some psychologists are researchers and others are practitioners, but all psychologists use scientific methods to inform their work.

Although it is easy to think that everyday situations have commonsense answers, scientific studies have found that people are not always as good at predicting outcomes as they often think they are. The hindsight bias leads us to think that we could have predicted events that we could not actually have predicted.

Employing the scientific method allows psychologists to objectively and systematically understand human behavior.

Psychologists study behavior at different levels of explanation, ranging from lower biological levels to higher social and cultural levels. The same behaviors can be studied and explained within psychology at different levels of explanation.

[4] Alexander, P. A., & Winne, P. H. (Eds.). (2006). *Handbook of educational psychology*(2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates; Woolfolk-Hoy, A. E. (2005).*Educational psychology* (9th ed.). Boston, MA: Allyn & Bacon.

[5] DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129*(1), 74–118.

[6] Borum, R. (2004). *Psychology of terrorism*. Tampa: University of South Florida.

[7] Lewin, K. (1999). *The complete social scientist: A Kurt Lewin reader* (M. Gold, Ed.). Washington, DC: American Psychological Association.

2.1 Psychologists Use the Scientific Method to Guide Their Research

LEARNING OBJECTIVES

1. Describe the principles of the scientific method and explain its importance in conducting and interpreting research.
2. Differentiate laws from theories and explain how research hypotheses are developed and tested.
3. Discuss the procedures that researchers use to ensure that their research with humans and with animals is ethical.

Psychologists aren't the only people who seek to understand human behavior and solve social problems. Philosophers, religious leaders, and politicians, among others, also strive to provide explanations for human behavior. But psychologists believe that research is the best tool for understanding human beings and their relationships with others. Rather than accepting the claim of a philosopher that people do (or do not) have free will, a psychologist would collect data to empirically test whether or not people are able to actively control their own behavior. Rather than accepting a politician's contention that creating (or abandoning) a new center for mental health will improve the lives of individuals in the inner city, a psychologist would empirically assess the effects of receiving mental health treatment on the quality of life of the recipients. The statements made by psychologists are empirical, which means they are *based on systematic collection and analysis of data*.

The Scientific Method

contrast to the abstract conceptual variables, the measured variables are very specific. This specificity is important for two reasons. First, more specific definitions mean that there is less danger that the collected data will be misunderstood by others. Second, specific definitions will enable future researchers to replicate the research.

Table 2.1 Examples of the Operational Definitions of Conceptual Variables That Have Been Used in Psychological Research

Conceptual variable	Operational definitions
Aggression	Number of presses of a button that administers shock to another student Number of seconds taken to honk the horn at the car ahead after a stoplight turns green
Interpersonal attraction	Number of inches that an individual places his or her chair away from another person Number of millimeters of pupil dilation when one person looks at another
Employee satisfaction	Number of days per month an employee shows up to work on time Rating of job satisfaction from 1 (*not at all satisfied*) to 9 (*extremely satisfied*)
Decision-making skills	Number of groups able to correctly solve a group performance task Number of seconds in which a person solves a problem
Depression	Number of negative words used in a creative story Number of appointments made with a psychotherapist

Conducting Ethical Research

One of the questions that all scientists must address concerns the ethics of their research. Physicists are concerned about the potentially harmful outcomes of their experiments with nuclear materials. Biologists worry about the potential outcomes of creating genetically engineered human babies. Medical researchers agonize over the ethics of withholding potentially beneficial drugs from control groups in clinical trials. Likewise, psychologists are continually considering the ethics of their research.

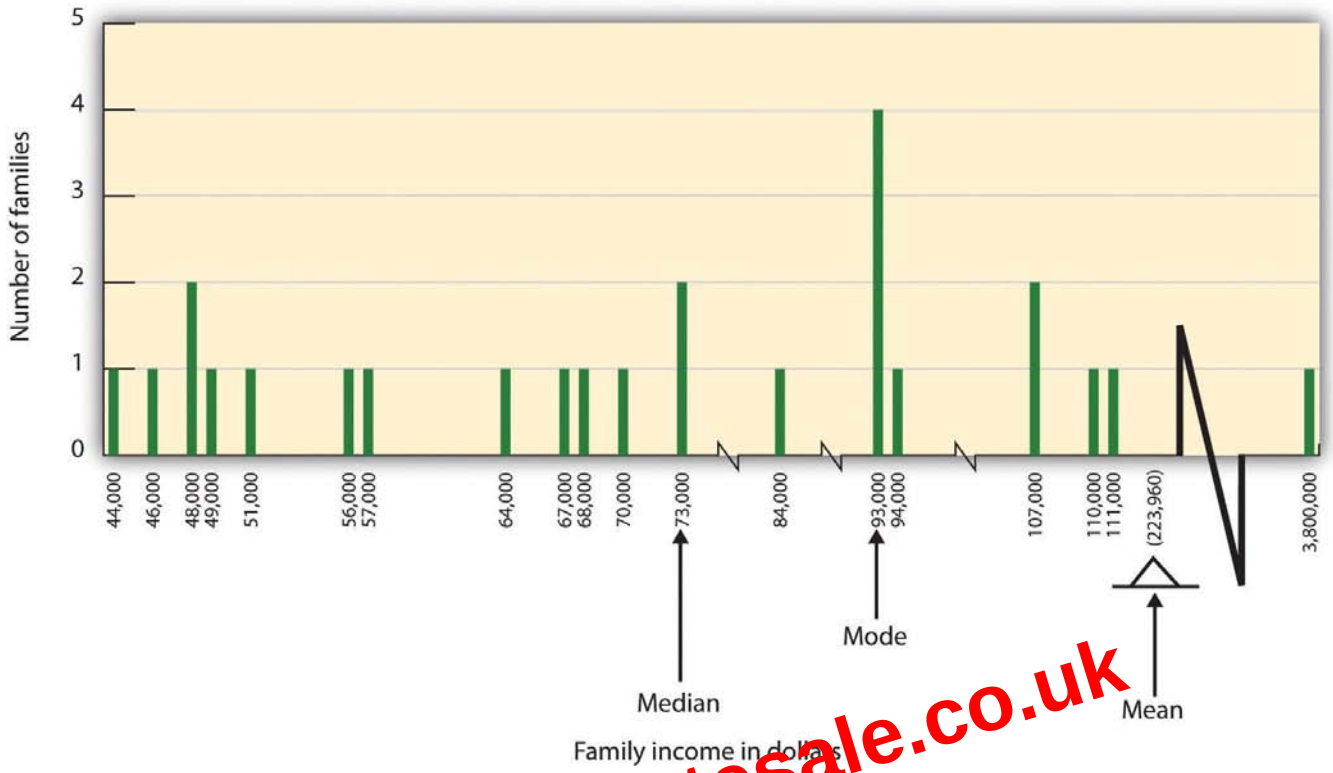
KEY TAKEAWAYS

- Psychologists use the scientific method to generate, accumulate, and report scientific knowledge.
- Basic research, which answers questions about behavior, and applied research, which finds solutions to everyday problems, inform each other and work together to advance science.
- Research reports describing scientific studies are published in scientific journals so that other scientists and laypersons may review the empirical findings.
- Organizing principles, including laws, theories and research hypotheses, give structure and uniformity to scientific methods.
- Concerns for conducting ethical research are paramount. Researchers assure that participants are given free choice to participate and that their privacy is protected. Informed consent and debriefing help provide humane treatment of participants.
- A cost-benefit analysis is used to determine what research should and should not be allowed to proceed.

EXERCISES AND CRITICAL THINKING

1. Give an example from personal experience of how you or someone you know have benefited from the results of scientific research.
2. Find and discuss a research project that in your opinion has ethical concerns. Explain why you find these concerns to be troubling.
3. Indicate your personal feelings about the use of animals in research. When should and should not animals be used? What principles have you used to come to these conclusions?

[1] Kohlberg, L. (1966). A cognitive-developmental analysis of children's sex-role concepts and attitudes. In E. E. Maccoby (Ed.), *The development of sex differences*. Stanford, CA: Stanford University Press.



The distribution of family incomes is likely to be nonsymmetrical because some incomes can be very large in comparison to most incomes. In this case, the median or the mode is a better indicator of central tendency than is the mean.

A final measure of central tendency, known as the mode, represents *the value that occurs most frequently in the distribution*. You can see from Figure 2.6 "Family Income Distribution" that the mode for the family income variable is $93,000 (it occurs four times).

In addition to summarizing the central tendency of a distribution, descriptive statistics convey information about how the scores of the variable are spread around the central tendency. *Dispersion* refers to the extent to which the scores are all tightly clustered around the central tendency, like this:

anxiety, or that taller people are smarter than shorter people, the research is valid only if the therapy really works or if taller people really are smarter. Unfortunately, there are many threats to the validity of research, and these threats may sometimes lead to unwarranted conclusions. Often, and despite researchers' best intentions, some of the research reported on websites as well as in newspapers, magazines, and even scientific journals is invalid. Validity is not an all-or-nothing proposition, which means that some research is more valid than other research. Only by understanding the potential threats to validity will you be able to make knowledgeable decisions about the conclusions that can or cannot be drawn from a research project. There are four major types of threats to the validity of research, and informed consumers of research are aware of each type.

Threats to the Validity of Research

1. *Threats to construct validity*. Although it is claimed that the measured variables measure the conceptual variables of interest, they actually may not.
2. *Threats to statistical conclusion validity*. Conclusions regarding the research may be incorrect because no statistical tests were made or because the statistical tests were incorrectly interpreted.
3. *Threats to internal validity*. Although it is claimed that the independent variable caused the dependent variable, the dependent variable actually may have been caused by a confounding variable.
4. *Threats to external validity*. Although it is claimed that the results are more general, the observed effects may actually only be found under limited conditions or for specific groups of people. (Stangor, 2011) [1]

One threat to valid research occurs when there is a threat to *construct validity*. Construct validity refers to *the extent to which the variables used in the research adequately assess the conceptual variables they were designed to measure*. One requirement for construct validity is that the measure be *reliable*, where reliability refers to *the consistency of a measured variable*. A bathroom scale is usually reliable, because if we step on and off it a couple of times the scale will consistently measure the same weight every time. Other measures, including some psychological tests, may be less reliable, and thus less useful.

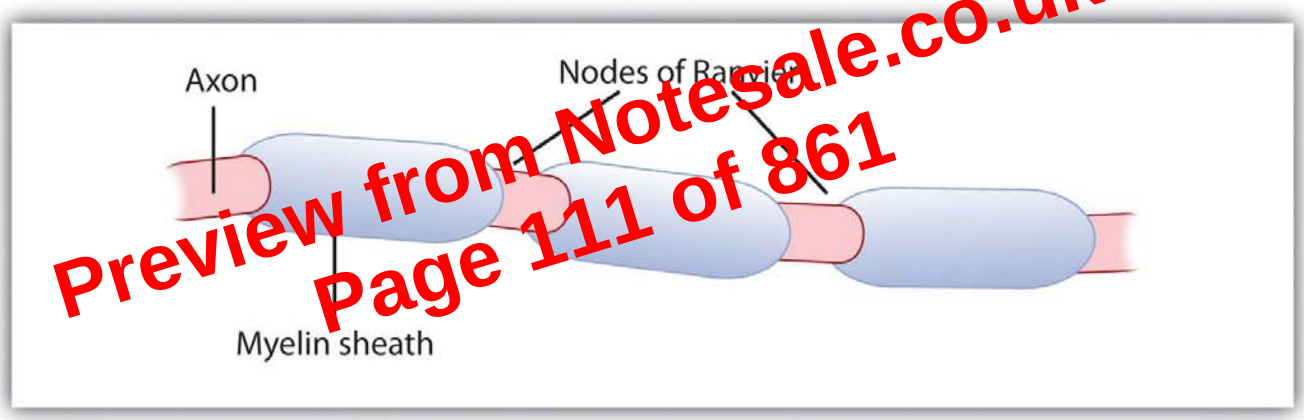
Confounding occurs when a variable that is not part of the research hypothesis is "mixed up," or confounded with, the variable in the research hypothesis. In the bottom panel alcohol consumed and alcohol expectancy are confounded, but in the top panel they are separate (independent). Confounding makes it impossible to be sure that the independent variable (rather than the confounding variable) caused the dependent variable.

Another threat to internal validity can occur when the experimenter knows the research hypothesis and also knows which experimental condition the participants are in. The outcome is the potential for experimenter bias, *a situation in which the experimenter subtly treats the research participants in the various experimental conditions differently, resulting in an invalid confirmation of the research hypothesis*. In one study demonstrating experimenter bias, Rosenthal and Fode (1963) [4] sent twelve students to test a research hypothesis concerning maze learning in rats. Although it was not initially revealed to the students, they were actually the participants in an experiment. Six of the students were randomly told that the rats they would be testing had been bred to be highly intelligent, whereas the other six students were led to believe that the rats had been bred to be unintelligent. In reality there were no differences among the rats given to the two groups of students. When the students returned with their data, a startling result emerged. The rats run by students who expected them to be intelligent showed significantly better maze learning than the rats run by students who expected them to be unintelligent. Somehow the students' expectations influenced their data. They evidently did something different when they tested the rats, perhaps subtly changing how they timed the maze running or how they treated the rats. And this experimenter bias probably occurred entirely out of their awareness.

To avoid experimenter bias, researchers frequently run experiments in which the researchers are *blind to condition*. This means that although the experimenters know the research hypotheses, they do not know which conditions the participants are assigned to. Experimenter bias cannot occur if the researcher is blind to condition. In a double-blind experiment, *both the researcher and the research participants are blind to condition*. For instance, in a double-blind trial of a drug, the researcher does not know whether the drug being given is the real drug or the

As you can see in Figure 3.4 "The Myelin Sheath and the Nodes of Ranvier", the axon is segmented by a series of *breaks between the sausage-like segments of the myelin sheath*. Each of these gaps is a node of Ranvier. The electrical charge moves down the axon from segment to segment, in a set of small jumps, moving from node to node. When the action potential occurs in the first segment of the axon, it quickly creates a similar change in the next segment, which then stimulates the next segment, and so forth as the positive electrical impulse continues all the way down to the end of the axon. As each new segment becomes positive, the membrane in the prior segment closes up again, and the segment returns to its negative resting potential. In this way the action potential is transmitted along the axon, toward the terminal buttons. The entire response along the length of the axon is very fast—it can happen up to 1,000 times each second.

Figure 3.4 *The Myelin Sheath and the Nodes of Ranvier*



The myelin sheath wraps around the axon but also leaves small gaps called the nodes of Ranvier. The action potential jumps from node to node as it travels down the axon.

An important aspect of the action potential is that it operates in an *all or nothing* manner. What this means is that the neuron either fires completely, such that the action potential moves all the way down the axon, or it does not fire at all. Thus neurons can provide more energy to the neurons down the line by firing faster but not by firing more strongly. Furthermore, the neuron is prevented from repeated firing by the presence of a *refractory period*—a brief time after the

Humans have a very large and highly developed outer brain layer known as the cerebral cortex. The cortex provides humans with excellent memory, outstanding cognitive skills, and the ability to experience complex emotions.

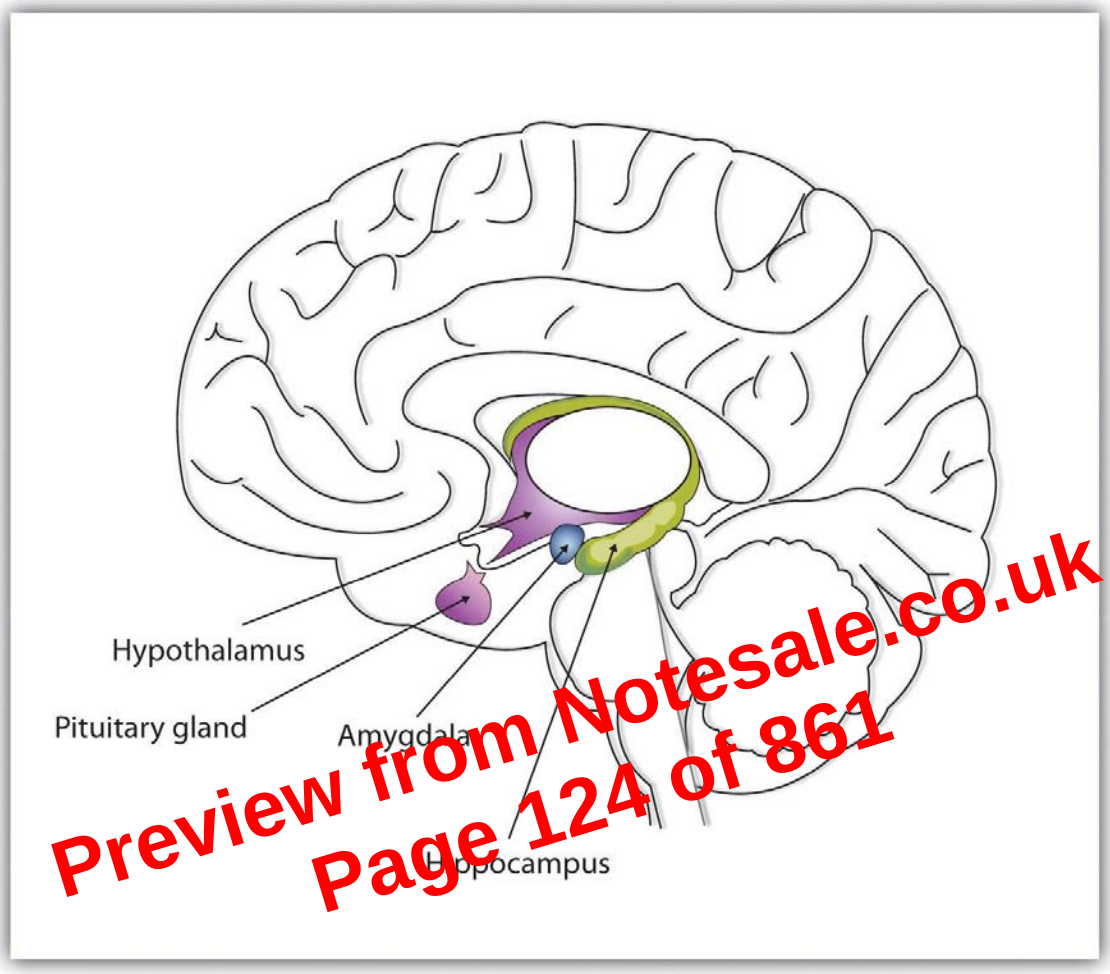
Source: Adapted from Wikia Education. (n.d.). Cerebral cortex. Retrieved from http://psychology.wikia.com/wiki/Cerebral_cortex.

The Old Brain: Wired for Survival

The brain stem is *the oldest and innermost region of the brain*. It's designed to control the most basic functions of life, including breathing, attention, and motor responses (Figure 3.8 "The Brain Stem and the Thalamus"). The brain stem begins where the spinal cord enters the skull and forms the medulla, *the area of the brain stem that controls heart rate and breathing*. In many cases the medulla alone is sufficient to maintain life—animals that have the remainder of their brains above the medulla severed are still able to eat, breathe, and even move. The pierical shape above the medulla is the pons, *a structure in the brain stem that helps control the movements of the body, playing a particularly important role in balance and walking*.

Running through the medulla and the pons is a long, narrow network of neurons known as the reticular formation. The job of the reticular formation is to filter out some of the stimuli that are coming into the brain from the spinal cord and to relay the remainder of the signals to other areas of the brain. The reticular formation also plays important roles in walking, eating, sexual activity, and sleeping. When electrical stimulation is applied to the reticular formation of an animal, it immediately becomes fully awake, and when the reticular formation is severed from the higher brain regions, the animal falls into a deep coma.

Figure 3.9 *The Limbic System*



This diagram shows the major parts of the limbic system, as well as the pituitary gland, which is controlled by it.

The cerebellum (literally, "little brain") *consists of two wrinkled ovals behind the brain stem. It functions to coordinate voluntary movement.*

People who have damage to the cerebellum have difficulty walking, keeping their balance, and holding their hands steady. Consuming alcohol influences the cerebellum, which is why people who are drunk have more difficulty walking in a straight line. Also, the cerebellum contributes to

emotional responses, helps us discriminate between different sounds and textures, and is important in learning (Bower & Parsons, 2003).[2]

Whereas the primary function of the brain stem is to regulate the most basic aspects of life, including motor functions, the *limbic system* is largely responsible for memory and emotions, including our responses to reward and punishment. The limbic system is *a brain area, located between the brain stem and the two cerebral hemispheres, that governs emotion and memory. It includes the amygdala, the hypothalamus, and the hippocampus*.

The amygdala *consists of two ñalmond-shaped" clusters (amygdala comes from the Latin word for "almond") and is primarily responsible for regulating our perceptions of, and reactions to, aggression and fear*. The amygdala has connections to other bodily systems related to fear, including the sympathetic nervous system (which we will see later is important in fear responses), facial responses (which perceive and express emotions), the processing of smells, and the release of neurotransmitters related to stress and aggression (Best, 2009).[3] In one early study, Klüver and Bucy (1939)[4] damaged the amygdala of an aggressive rhesus monkey. They found that the once angry animal immediately became passive and no longer responded to fearful situations with aggressive behavior. Electrical stimulation of the amygdala in other animals also influences aggression. In addition to helping us experience fear, the amygdala also helps us learn from situations that create fear. When we experience events that are dangerous, the amygdala stimulates the brain to remember the details of the situation so that we learn to avoid it in the future (Sigurdsson, Doyère, Cain, & LeDoux, 2007).[5]

Located just under the thalamus (hence its name) the hypothalamus is *a brain structure that contains a number of small areas that perform a variety of functions, including the important role of linking the nervous system to the endocrine system via the pituitary gland*. Through its many interactions with other parts of the brain, the hypothalamus helps regulate body temperature, hunger, thirst, and sex, and responds to the satisfaction of these needs by creating feelings of pleasure. Olds and Milner (1954)[6] discovered these reward centers accidentally after they had momentarily stimulated the hypothalamus of a rat. The researchers noticed that after

The key to the advanced intelligence of humans is not found in the size of our brains. What sets humans apart from other animals is our larger cerebral cortex—*the outer bark-like layer of our brain that allows us to so successfully use language, acquire complex skills, create tools, and live in social groups* (Gibson, 2002).[8] In humans, the cerebral cortex is wrinkled and folded, rather than smooth as it is in most other animals. This creates a much greater surface area and size, and allows increased capacities for learning, remembering, and thinking. The folding of the cerebral cortex is referred to as *corticalization*.

Although the cortex is only about one tenth of an inch thick, it makes up more than 80% of the brain's weight. The cortex contains about 20 billion nerve cells and 300 trillion synaptic connections (de Courten-Myers, 1999).[9] Supporting all these neurons are billions more glial cells (glia), *cells that surround and link to the neurons, protecting them, providing them with nutrients, and absorbing unused neurotransmitters*. The glia come in different forms and have different functions. For instance, the myelin sheath surrounding the axon of many neurons is a type of glial cell. The glia are essential partners of neurons, without which the neurons could not survive or function (Miller, 2005).[10]

The cerebral cortex is divided into two *hemispheres*, and each hemisphere is divided into four *lobes*, each separated by folds known as *fissures*. If we look at the cortex starting at the front of the brain and moving over the top (see Figure 3.10 "The Two Hemispheres"), we see first the frontal lobe (behind the forehead), *which is responsible primarily for thinking, planning, memory, and judgment*. Following the frontal lobe is the parietal lobe, *which extends from the middle to the back of the skull and which is responsible primarily for processing information about touch*. Then comes the occipital lobe, *at the very back of the skull, which processes visual information*. Finally, in front of the occipital lobe (pretty much between the ears) is the temporal lobe, *responsible primarily for hearing and language*.

Figure 3.10 The Two Hemispheres

Other areas of the cortex process other types of sensory information. Thevisual cortex is *the area located in the occipital lobe (at the very back of the brain) that processes visual information*. If you were stimulated in the visual cortex, you would see flashes of light or color, and perhaps you remember having had the experience of "seeing stars" when you were hit in, or fell on, the back of your head. The temporal lobe, located on the lower side of each hemisphere, contains the auditory cortex, *which is responsible for hearing and language*. The temporal lobe also processes some visual information, providing us with the ability to name the objects around us (Martin, 2007).[12]

As you can see in Figure 3.11 "The Sensory Cortex and the Motor Cortex", the motor and sensory areas of the cortex account for a relatively small part of the total cortex. The remainder of the cortex is made up of association areas *in which sensory and motor information is combined and associated with our stored knowledge*. These association areas are the places in the brain that are responsible for most of the things that make human beings seem human. The association areas are involved in higher mental functions, such as learning, thinking, planning, judging, moral reflecting, figuring, and spatial reasoning.

The Brain Is Flexible: Neuroplasticity

The control of some specific bodily functions, such as movement, vision, and hearing, is performed in specified areas of the cortex, and if these areas are damaged, the individual will likely lose the ability to perform the corresponding function. For instance, if an infant suffers damage to facial recognition areas in the temporal lobe, it is likely that he or she will never be able to recognize faces (Farah, Rabinowitz, Quinn, & Liu, 2000).[13] On the other hand, the brain is not divided up in an entirely rigid way. The brain's neurons have a remarkable capacity to reorganize and extend themselves to carry out particular functions in response to the needs of the organism, and to repair damage. As a result, the brain constantly creates new neural communication routes and rewires existing ones. Neuroplasticity refers to *the brain's ability to change its structure and function in response to experience or damage*. Neuroplasticity enables us to learn and remember new things and adjust to new experiences.

Our brains are the most "plastic" when we are young children, as it is during this time that we learn the most about our environment. On the other hand, neuroplasticity continues to be observed even in adults (Kolb & Fantie, 1989).[14] The principles of neuroplasticity help us understand how our brains develop to reflect our experiences. For instance, accomplished musicians have a larger auditory cortex compared with the general population (Bengtsson et al., 2005)[15] and also require less neural activity to move their fingers over the keys than do novices (Münte, Altenmüller, & Jäncke, 2002).[16] These observations reflect the changes in the brain that follow our experiences.

Plasticity is also observed when there is damage to the brain or to parts of the body that are represented in the motor and sensory cortexes. When a tumor in the left hemisphere of the brain impairs language, the right hemisphere will begin to compensate to help the person recover the ability to speak (Thiel et al., 2006).[17] And if a person loses a finger, the area of the sensory cortex that previously received information from the missing finger will begin to receive input from adjacent fingers, causing the remaining digits to become more sensitive to touch (Fox, 1984).[18]

Although neurons cannot repair or regenerate themselves as skin or blood vessels can, new evidence suggests that the brain can engage in neurogenesis,*the forming of new neurons* (Van Praag, Zhao, Gage, & Gazzaniga, 2004).[19]These new neurons originate deep in the brain and may then migrate to other brain areas where they form new connections with other neurons (Gould, 2007).[20] This leaves open the possibility that someday scientists might be able to "rebuild" damaged brains by creating drugs that help grow neurons.

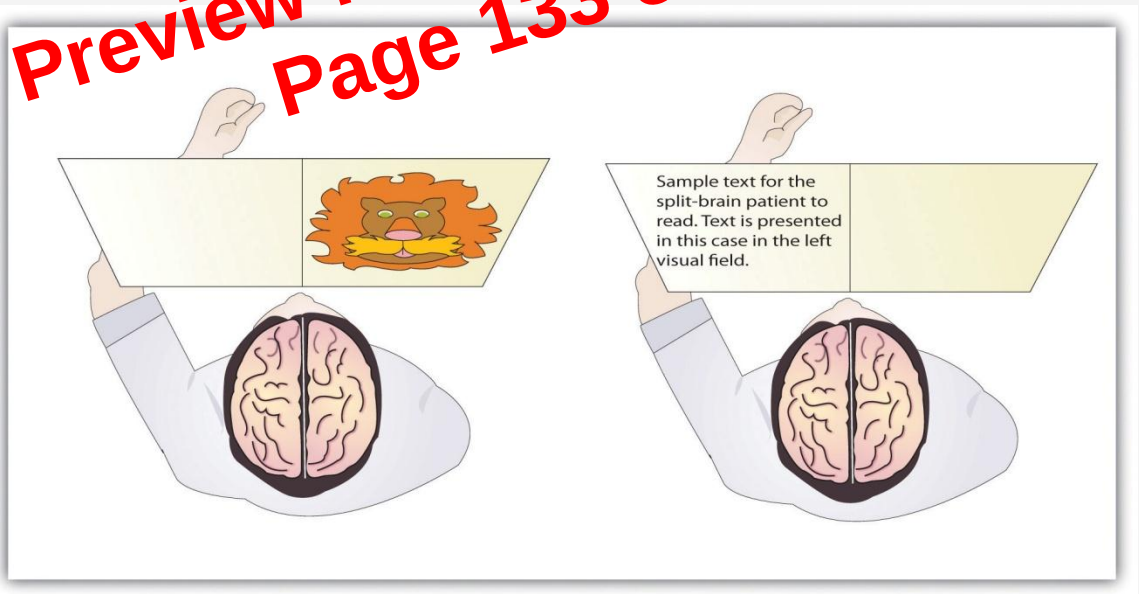
Research Focus: Identifying the Unique Functions of the Left and Right Hemispheres Using Split-Brain Patients

We have seen that the left hemisphere of the brain primarily senses and controls the motor movements on the right side of the body, and vice versa. This fact provides an interesting way to studybrain lateralization—*the idea that the left and the right hemispheres of the brain are specialized to perform different functions*. Gazzaniga, Bogen, and Sperry (1965)[21] studied a patient, known as W. J., who had undergone an operation to relieve severe seizures. In this

surgery *the region that normally connects the two halves of the brain and supports communication between the hemispheres*, known as thecorpus callosum, is severed. As a result, the patient essentially becomes a person with two separate brains. Because the left and right hemispheres are separated, each hemisphere develops a mind of its own, with its own sensations, concepts, and motivations (Gazzaniga, 2005).[22]

In their research, Gazzaniga and his colleagues tested the ability of W. J. to recognize and respond to objects and written passages that were presented to only the left or to only the right brain hemispheres (see Figure 3.12 "Visual and Verbal Processing in the Split-Brain Patient"). The researchers had W. J. look straight ahead and then flashed, for a fraction of a second, a picture of a geometrical shape to the left of where he was looking. By doing so, they assured that—because the two hemispheres had been separated—the image of the shape was experienced only in the right brain hemisphere (remember that sensory input from the left side of the body is sent to the right side of the brain). Gazzaniga and his colleagues found that W. J. was able to identify what he had been shown when he was asked to pick the object from a series of shapes, using his left hand, but that he could not do this when the object was shown in the right visual field. On the other hand, W. J. could easily read written material presented in the right visual field (and thus experienced in the left hemisphere) but not when it was presented in the left visual field.

Figure 3.12 Visual and Verbal Processing in the Split-Brain Patient



At least some handedness is determined by genetics. Ultrasound scans show that 9 out of 10 fetuses suck the thumb of their right hand, suggesting that the preference is determined before birth (Hepper, Wells, & Lynch, 2005),[26] and the mechanism of transmission has been linked to a gene on the X chromosome (Jones & Martin, 2000).[27] It has also been observed that left-handed people are likely to have fewer children, and this may be in part because the mothers of left-handers are more prone to miscarriages and other prenatal problems (McKeever, Cerone, Suter, & Wu, 2000).[28]

But culture also plays a role. In the past, left-handed children were forced to write with their right hands in many countries, and this practice continues, particularly in collectivistic cultures, such as India and Japan, where left-handedness is viewed negatively as compared with individualistic societies, such as the United States. For example, India has about half as many left-handers as the United States (Ida & Mandal, 2003).[29]

There are both advantages and disadvantages to being left-handed in a world where most people are right-handed. One problem for lefties is that the world is designed for right-handers. Automatic teller machines (ATMs), classroom desks, scissors, microscopes, drill presses, and table saws are just some examples of everyday machinery that is designed with the most important controls on the right side. This may explain in part why left-handers suffer somewhat more accidents than do right-handers (Dutta & Mandal, 2006).[30]

Despite the potential difficulty living and working in a world designed for right-handers, there seem to be some advantages to being left-handed. Throughout history, a number of prominent artists have been left-handed, including Leonardo da Vinci, Michelangelo, Pablo Picasso, and Max Escher. Because the right hemisphere is superior in imaging and visual abilities, there may be some advantage to using the left hand for drawing or painting (Springer & Deutsch, 1998).[31] Left-handed people are also better at envisioning three-dimensional objects, which may explain why there is such a high number of left-handed architects, artists, and chess players in proportion to their numbers (Coren, 1992).[32] However, there are also more left-handers among those with reading disabilities, allergies, and migraine headaches (Geschwind & Behan, 2007),[33] perhaps due to the fact that a small minority of left-handers owe their handedness to a birth trauma, such as being born prematurely (Betancur, Vélez, Cabanieu, & le Moal, 1990).[34]

In sports in which handedness may matter, such as tennis, boxing, fencing, or judo, left-handers may have an advantage. They play many games against right-handers and learn how to best handle their styles. Right-handers, however, play very few games against left-handers, which may make them more vulnerable. This explains why a

Figure 3.19 *The Autonomic Nervous System*

Neurons are the cells in the nervous system. Neurons are composed of a soma that contains the nucleus of the cell; a dendrite that collects information from other cells and sends the information to the soma; and a long segmented fiber, known as the axon, which transmits information away from the cell body toward other neurons and to the muscles and glands.

The nervous system operates using an electrochemical process. An electrical charge moves through the neuron itself, and chemicals are used to transmit information between neurons. Within the neuron, the electrical charge occurs in the form of an action potential. The action potential operates in an all-or-nothing manner.

Neurons are separated by junction areas known as synapses. Neurotransmitters travel across the synaptic space between the terminal button of one neuron and the dendrites of other neurons, where they bind to the dendrites in the neighboring neurons. More than 100 chemical substances produced in the body have been identified as neurotransmitters, and these substances have a wide and profound effect on emotion, cognition, and behavior.

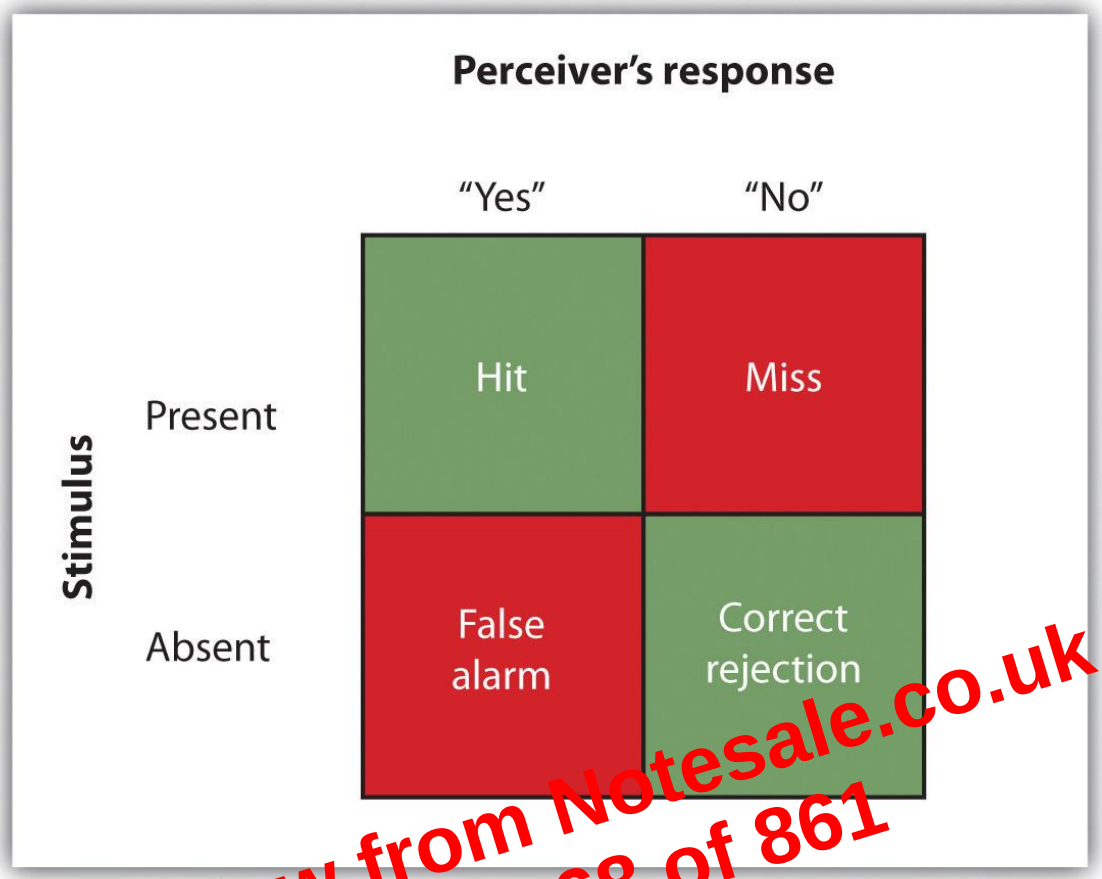
Drugs that we may ingest may either mimic (agonists) or block (antagonists) the operations of neurotransmitters.

The brains of all animals are layered, and generally quite similar in overall form.

The brain stem is the oldest and innermost region of the brain. It controls the most basic functions of life, including breathing, attention, and motor responses. The brain stem includes the medulla, the pons, and the reticular formation.

Above the brain stem are other parts of the old brain involved in the processing of behavior and emotions, including the thalamus, the cerebellum, and the limbic system. The limbic system includes the amygdala, the hypothalamus, and the hippocampus.

The cerebral cortex contains about 20 billion nerve cells and 300 trillion synaptic connections, and it's supported by billions more glial cells that surround and link to the neurons. The cerebral



Our ability to accurately detect stimuli is measured using a signal detection analysis. Two of the possible decisions (hits and correct rejections) are accurate; the other two (misses and false alarms) are errors.

The analysis of the data from a psychophysics experiment creates two measures. One measure, known as *sensitivity*, refers to the true ability of the individual to detect the presence or absence of signals. People who have better hearing will have higher sensitivity than will those with poorer hearing. The other measure, *response bias*, refers to a behavioral tendency to respond "yes" to the trials, which is independent of sensitivity.

Imagine for instance that rather than taking a hearing test, you are a soldier on guard duty, and your job is to detect the very faint sound of the breaking of a branch that indicates that an enemy is nearby. You can see that in this case making a false alarm by alerting the other soldiers to the

3. Take a moment and lie down quietly in your bedroom. Notice the variety and levels of what you can see, hear, and feel. Does this experience help you understand the idea of the absolute threshold?

[1] Stoffregen, T. A., & Bardy, B. G. (2001). On specification and the senses. *Behavioral and Brain Sciences, 24*(2), 195–261.

[2] Galanter, E. (1962). *Contemporary Psychophysics*. In R. Brown, E. Galanter, E. H. Hess, & G. Mandler (Eds.), *New directions in psychology*. New York, NY: Holt, Rinehart and Winston.

[3] Macmillan, N. A., & Creelman, C. D. (2005). *Detection theory: A user's guide* (2nd ed). Mahwah, NJ: Lawrence Erlbaum Associates; Wickens, T. D. (2002). *Elementary signal detection theory*. New York, NY: Oxford University Press.

[4] Dijksterhuis, A. (2010). Automaticity and the unconscious. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., Vol. 1, pp. 228–267). Hoboken, NJ: John Wiley & Sons.

[5] Karremans, J. C., Stroebe, W., & Claus, J. (2006). Beyond Vicary's fantasies: The impact of subliminal priming and brand choice. *Journal of Experimental Social Psychology, 42*(6), 792–798.

[6] Trappey, C. (1996). A meta-analysis of consumer choice and subliminal advertising.*Psychology and Marketing, 13*, 517–530.

[7] Saegert, J. (1987). Why marketing should quit giving subliminal advertising the benefit of the doubt. *Psychology and Marketing, 4*(2), 107–120.

[8] Harris, J. L., Bargh, J. A., & Brownell, K. D. (2009). Priming effects of television food advertising on eating behavior. *Health Psychology, 28(4)*, 404–413.

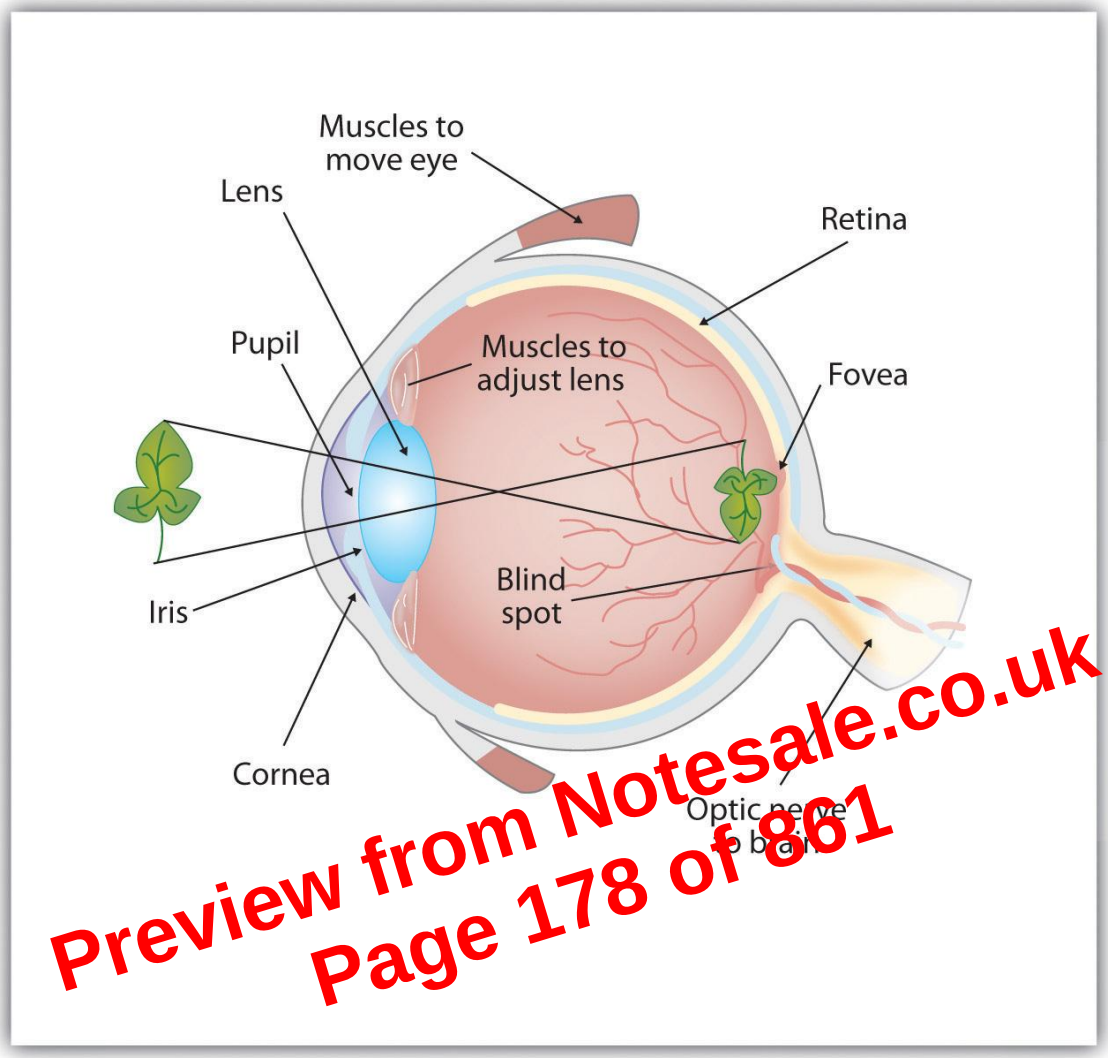
[9] Weiskrantz, L. (1997). *Consciousness lost and found: A neuropsychological exploration.*New York, NY: Oxford University Press.

4.2 Seeing

LEARNING OBJECTIVES

1. Identify the key structures of the eye and the role they play in vision.
2. Summarize how the eye and the visual cortex work together to sense and perceive the visual stimuli in the environment, including processing colors, shape, depth, and motion.

Whereas other animals rely primarily on hearing, smell, or touch to understand the world around them, human beings rely in large part on vision. A large part of our cerebral cortex is devoted to seeing, and we have substantial visual skills. Seeing begins when light falls on the eyes, initiating



Light enters the eye through the transparent cornea, passing through the pupil at the center of the iris. The lens adjusts to focus the light on the retina, where it appears upside down and backward. Receptor cells on the retina send information via the optic nerve to the visual cortex.

Accommodation is not always perfect, and in some cases the light that is hitting the retina is a bit out of focus. As you can see in Figure 4.8 "Normal, Nearsighted, and Farsighted Eyes", if the focus is in front of the retina, we say that the person is *nearsighted*, and when the focus is behind the retina we say that the person is *farsighted*. Eyeglasses and contact lenses correct this problem

Principle	Description	Example	Image
	incomplete image to create a complete, whole object.	right rather than a set of unrelated cones.	

Perceiving Depth

Depth perception is *the ability to perceive three-dimensional space and to accurately judge distance*. Without depth perception, we would be unable to drive a car, thread a needle, or simply navigate our way around the supermarket (Howard & Rogers, 2001).[8] Research has found that depth perception is in part based on innate capacities and in part learned through experience (Witherington, 2005).[9]

Psychologists Eleanor Gibson and Richard Walk (1960)[10] tested the ability to perceive depth in 6- to 14-month-old infants by placing them on a visual cliff,*a mechanism that gives the perception of a dangerous drop-off, in which infants can be safely tested for their perception of depth* (Figure 4.22 "Visual Cliff"). The infants were placed on one side of the "cliff," while their

mothers called to them from the other side. Gibson and Walk found that most infants either crawled away from the cliff or remained on the board and cried because they wanted to go to their mothers, but the infants perceived a chasm that they instinctively could not cross. Further research has found that even very young children who cannot yet crawl are fearful of heights (Campos, Langer, & Krowitz, 1970).[11] On the other hand, studies have also found that infants improve their hand-eye coordination as they learn to better grasp objects and as they gain more experience in crawling, indicating that depth perception is also learned (Adolph, 2000).[12]

Depth perception is the result of our use of depth cues, *messages from our bodies and the external environment that supply us with information about space and distance*. Binocular depth cues are *depth cues that are created by retinal image disparity—that is, the space between our eyes, and thus which require the coordination of both eyes.* One outcome of retinal disparity is that the images projected on each eye are slightly different from each other. The visual cortex automatically merges the two images into one, enabling us to perceive depth. Three-dimensional movies make use of retinal disparity by using 3-D glasses that the viewer wears to create a different image on each eye. The perceptual system quickly, easily, and unconsciously turns the disparity into 3-D.

An important binocular depth cue is convergence, *the inward turning of our eyes that is required to focus on objects that are less than about 50 feet away from us*. The visual cortex uses the size of the convergence angle between the eyes to judge the object's distance. You will be able to feel your eyes converging if you slowly bring a finger closer to your nose while continuing to focus on it. When you close one eye, you no longer feel the tension—convergence is a binocular depth cue that requires both eyes to work.

The visual system also uses *accommodation* to help determine depth. As the lens changes its curvature to focus on distant or close objects, information relayed from the muscles attached to the lens helps us determine an object's distance. Accommodation is only effective at short viewing distances, however, so while it comes in handy when threading a needle or tying shoelaces, it is far less effective when driving or playing sports.

fact that the Chaser group's motorcade was a fake—they focused on some aspects of the situation, such as the color of the cars and the fact that they were there at all, and completely ignored others (the details of the security information).

Video Clip: Selective Attention

Watch this video and carefully count how many times the people pass the ball to each other.

Selective attention also allows us to focus on a single talker at a party while ignoring other conversations that are occurring around us (Broadbent, 1958; Cherry, 1953).[5] Without this automatic selective attention, we'd be unable to focus on the single conversation we want to hear. But selective attention is not complete; we also at the same time monitor what's happening in the channels we are not focusing on. Perhaps you have had the experience of being at a party and talking to someone in one part of the room, when suddenly you hear your name being mentioned by someone in another part of the room. This *cocktail party phenomenon* shows us that although selective attention is limiting what we processes, we are nevertheless at the same time doing a lot of unconscious monitoring of the world around us—you didn't know you were attending to the background sounds of the party, but evidently you were.

A second fundamental process of perception is sensory adaptation—*a decreased sensitivity to a stimulus after prolonged and constant exposure*. When you step into a swimming pool, the water initially feels cold, but after a while you stop noticing it. After prolonged exposure to the same stimulus, our sensitivity toward it diminishes and we no longer perceive it. The ability to adapt to the things that don't change around us is essential to our survival, as it leaves our sensory receptors free to detect the important and informative changes in our environment and to respond accordingly. We ignore the sounds that our car makes every day, which leaves us free to pay attention to the sounds that are different from normal, and thus likely to need our attention. Our sensory receptors are alert to novelty and are fatigued after constant exposure to the same stimulus.

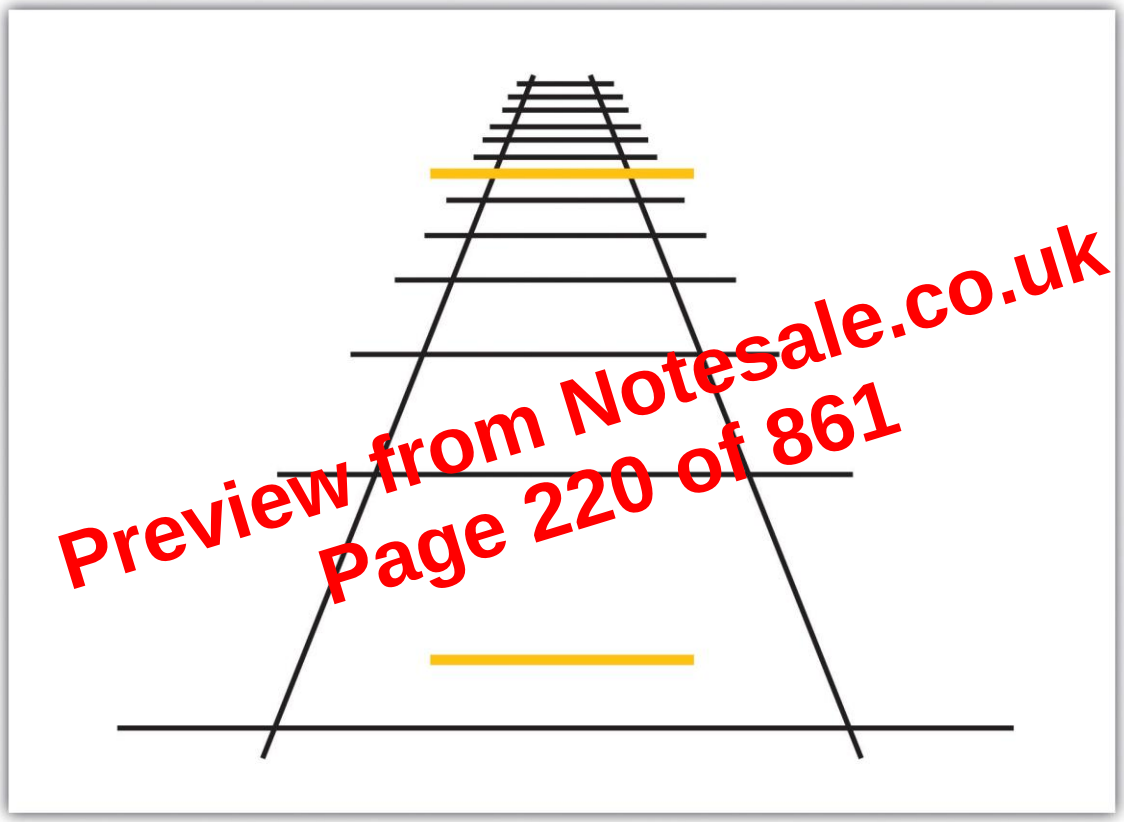
If sensory adaptation occurs with all senses, why doesn't an image fade away after we stare at it for a period of time? The answer is that, although we are not aware of it, our eyes are constantly flitting from one angle to the next, making thousands of tiny movements (called *saccades*) every minute. This constant eye movement guarantees that the image we are viewing always falls on fresh receptor cells. What would happen if we could stop the movement of our eyes? Psychologists have devised a way of testing the sensory adaptation of the eye by attaching an instrument that ensures a constant image is maintained on the eye's inner surface. Participants are fitted with a contact lens that has miniature slide projector attached to it. Because the projector follows the exact movements of the eye, the same image is always projected, stimulating the same spot, on the retina. Within a few seconds, interesting things begin to happen. The image will begin to vanish, then reappear, only to disappear again, either in pieces or as a whole. Even the eye experiences sensory adaptation (Yarbus, 1967). [6]

One of the major problems in perception is to ensure that we always perceive the same object in the same way, despite the fact that the sensations that it creates on our receptors changes dramatically. *The ability to perceive a stimulus as constant despite changes in sensation* is known as perceptual constancy. Consider our image of a door as it swings. When it is closed, we see it as rectangular, but when it is open, we see only its edge and it appears as a line. But we never perceive the door as changing shape as it swings—perceptual mechanisms take care of the problem for us by allowing us to see a constant shape.

The visual system also corrects for color constancy. Imagine that you are wearing blue jeans and a bright white t-shirt. When you are outdoors, both colors will be at their brightest, but you will still perceive the white t-shirt as bright and the blue jeans as darker. When you go indoors, the light shining on the clothes will be significantly dimmer, but you will still perceive the t-shirt as bright. This is because we put colors in context and see that, compared to its surroundings, the white t-shirt reflects the most light (McCann, 1992). [7] In the same way, a green leaf on a cloudy day may reflect the same wavelength of light as a brown tree branch does on a sunny day. Nevertheless, we still perceive the leaf as green and the branch as brown.

The *Ponzo illusion* operates on the same principle. As you can see in Figure 4.37 "The Ponzo Illusion", the top yellow bar seems longer than the bottom one, but if you measure them you'll see that they are exactly the same length. The monocular depth cue of linear perspective leads us to believe that, given two similar objects, the distant one can only cast the same size retinal image as the closer object if it is larger. The topmost bar therefore appears longer.

Figure 4.37 The Ponzo Illusion



The Ponzo illusion is caused by a failure of the monocular depth cue of linear perspective: Both bars are the same size even though the top one looks larger.

Illusions demonstrate that our perception of the world around us may be influenced by our prior knowledge. But the fact that some illusions exist in some cases does not mean that the perceptual system is generally inaccurate—in fact, humans normally become so closely in touch with their

safety measures, where copilots must call out the altitude progressively during the descent, which has probably decreased the number of landing accidents.

Figure 4.38 presents the design of an airplane instrument panel before and after it was redesigned by human factors psychologists. On the left is the initial design in which the controls were crowded and cluttered, in no logical sequence, each control performing one task. The controls were more or less the same in color, and the gauges were not easy to read. The redesigned digital cockpit (right on Figure 4.38) shows a marked improvement in usability. More of the controls are color-coded and multifunctional so that there is less clutter on the dashboard. Screens make use of LCD and 3-D graphics. Text sizes are changeable—increasing readability—and many of the functions have become automated, freeing up the pilots concentration for more important activities.

Figure 4.38

One important aspect of the redesign was based on the principles of sensory adaptation. Displays that are easy to see in darker conditions quickly become unreadable when the sun shines directly on them. It takes the pilot a relatively long time to adapt to the suddenly much brighter display. Furthermore, perceived contrast is important. The display cannot be so bright at night that the pilot is unable to see targets in the sky or on the land. Human factors psychologists used these principles to determine the appropriate stimulus intensity needed on these displays so that pilots would be able to read them accurately and quickly under a wide range of conditions. The psychologists accomplished this by developing an automatic control mechanism that senses the ambient light visible through the front cockpit windows and that detects the light falling on the display surface, and then automatically adjusts the intensity of the display for the pilot (Silverstein, Krantz, Gomer, Yeh, & Monty, 1990; Silverstein & Merrifield, 1985).[24]

KEY TAKEAWAYS

- Sensory interaction occurs when different senses work together, for instance, when taste, smell, and touch together produce the flavor of food.
- Selective attention allows us to focus on some sensory experiences while tuning out others.

Chapter 5
States of Consciousness

An Unconscious Killing

During the night of May 23, 1987, Kenneth Parks, a 23-year old Canadian with a wife, a baby daughter, and heavy gambling debts, got out of his bed, climbed into his car, and drove 15 miles to the home of his wife's parents in the suburbs of Toronto. There, he attacked them with a knife, killing his mother-in-law and severely injuring his father-in-law. Parks then drove to a police station and stumbled into the building, holding up his bloody hands and saying, "I think I killed some people…my hands." The police arrested him and took him to a hospital, where surgeons repaired several deep cuts on his hands. Only then did police discover that he had indeed assaulted his in-laws.

Parks claimed that he could not remember anything about the crime. He said that he remembered going to sleep in his bed, then awakening in the police station with bloody hands, but nothing in between. His defense was that he had been asleep during the entire incident and was not aware of his actions (Martin, 2009).[1]

Not surprisingly, no one believed this explanation at first. However, further investigation established that he did have a long history of sleepwalking, he had no motive for the crime, and despite repeated attempts to trip him up in numerous interviews, he was completely consistent in his story, which also fit the timeline of events. Parks was examined by a team of sleep specialists, who found that the pattern of brain waves that occurred while he slept was very abnormal (Broughton, Billings, Cartwright, & Doucette, 1994).[2] The specialists eventually concluded that sleepwalking, probably precipitated by stress and anxiety over his financial troubles, was the most likely explanation of his aberrant behavior. They also agreed that such a combination of stressors was unlikely to happen again, so he was not likely to undergo another such violent episode and was probably not a hazard to others. Given this combination of evidence, the jury acquitted Parks of murder and assault charges. He walked out of the courtroom a free man (Wilson, 1998).[3]

Consciousness is defined as *our subjective awareness of ourselves and our environment* (Koch, 2004).[4] The experience of consciousness is fundamental to human nature. We all know what it means to be conscious, and we assume (although we can never be sure) that other human beings experience their consciousness similarly to how we experience ours.

Each stage of sleep has its own distinct pattern of brain activity.

Normally, if we are allowed to keep sleeping, we will move from stage N1 to stage N2 sleep. During stage N2, muscular activity is further decreased and conscious awareness of the environment is lost. This stage typically represents about half of the total sleep time in normal adults. Stage N2 sleep is characterized by theta waves interspersed with bursts of rapid brain activity known as *sleep spindles*.

Stage N3, also known as *slow wave sleep,* is the deepest level of sleep, characterized by an increased proportion of very slow *delta waves*. This is the stage in which most sleep abnormalities, such as sleepwalking, sleeptalking, nightmares, and bed-wetting occur. The sleepwalking murders committed by Mr. Parks would have occurred in this stage. Some skeletal muscle tone remains, making it possible for affected individuals to rise from their beds and engage in sometimes very complex behaviors, but consciousness is distant. Even in the deepest sleep, however, we are still aware of the external world. If smoke enters the room or if we hear the cry of a baby we are likely to react, even though we are sound asleep. These occurrences again demonstrate the extent to which we process information outside consciousness.

After falling initially into a very deep sleep, the brain begins to become more active again, and we normally move into the first period of REM sleep about 90 minutes after falling asleep. REM sleep is accompanied by an increase in heart rate, facial twitches, and the repeated rapid eye movements that give this stage its name. People who are awakened during REM sleep almost always report that they were dreaming, while those awakened in other stages of sleep report dreams much less often. REM sleep is also emotional sleep. Activity in the limbic system, including the amygdala, is increased during REM sleep, and the genitals become aroused, even if the content of the dreams we are having is not sexual. A typical 25-year-old man may have an erection nearly half of the night, and the common "morning erection" is left over from the last REM period before waking.

mimic the operation of a neurotransmitter; some are antagonists, which block the action of a neurotransmitter; and some work by blocking the reuptake of neurotransmitters at the synapse.

Table 5.1 Psychoactive Drugs by Class

Mechanism	Symptoms	Drug	Dangers and side effects	Psychological dependence	Physical dependence	Addiction potential	Addiction potential
Stimulants							
Stimulants block the reuptake of dopamine, norepinephrine, and serotonin in the synapses of the CNS.	Enhanced mood and increased energy	Caffeine	May create dependence	Low	Low	Low	
		Nicotine	Has major negative health effects if smoked or chewed	High	High	High	
		Cocaine	Decreased appetite, headache, [illegible]	[illegible]	Low	Moderate	
		Amphetamines	Possible dependence, accompanied by severe "crash" with depression as drug effects wear off, particularly if smoked or injected	Moderate	Low	Moderate to high	
Depressants							
Depressants change consciousness by increasing the production of the neurotransmitter GABA and decreasing the production of the neurotransmitter acetylcholine, usually at the level of the thalamus	Calming effects, sleep, pain relief, slowed heart rate and respiration	Alcohol	Impaired judgment, loss of coordination, dizziness, nausea, and eventually a loss of consciousness	Moderate	Moderate	Moderate	
		Barbiturates and benzodiazepines	Sluggishness, slowed speech, drowsiness, in	Moderate	Moderate	Moderate	

A stimulant is *a psychoactive drug that operates by blocking the reuptake of dopamine, norepinephrine, and serotonin in the synapses of the CNS*. Because more of these neurotransmitters remain active in the brain, the result is an increase in the activity of the sympathetic division of the autonomic nervous system (ANS). Effects of stimulants include increased heart and breathing rates, pupil dilation, and increases in blood sugar accompanied by decreases in appetite. For these reasons, stimulants are frequently used to help people stay awake and to control weight.

Used in moderation, some stimulants may increase alertness, but used in an irresponsible fashion they can quickly create dependency. A major problem is the "crash" that results when the drug loses its effectiveness and the activity of the neurotransmitters returns to normal. The withdrawal from stimulants can create profound depression and lead to an intense desire to repeat the high.

Caffeine is *a bitter psychoactive drug found in the beans, leaves, and fruits of plants*, where it acts as a natural pesticide. It is found in a wide variety of products, including coffee, tea, soft drinks, candy, and desserts. In North America, more than 80% of adults consume caffeine daily (Lovett, 2005).[4] Caffeine acts as a mood enhancer and provides energy. Although the U.S. Food and Drug Administration lists caffeine as a safe food substance, it has at least some characteristics of dependence. People who reduce their caffeine intake often report being irritable, restless, and drowsy, as well as experiencing strong headaches, and these withdrawal symptoms may last up to a week. Most experts feel that using small amounts of caffeine during pregnancy is safe, but larger amounts of caffeine can be harmful to the fetus (U.S. Food and Drug Administration, 2007).[5]

Nicotine is *a psychoactive drug found in the nightshade family of plants, where it acts as a natural pesticide*. Nicotine is the main cause for the dependence-forming properties of tobacco use, and tobacco use is a major health threat. Nicotine creates both psychological and physical addiction, and it is one of the hardest addictions to break. Nicotine content in cigarettes has slowly increased over the years, making quitting smoking more and more difficult. Nicotine is also found in smokeless (chewing) tobacco.

meditative state had more prominent alpha and theta waves, and other studies have shown declines in heart rate, skin conductance, oxygen consumption, and carbon dioxide elimination during meditation (Dillbeck, Glenn, & Orme-Johnson, 1987; Fenwick, 1987).[26] These studies suggest that the action of the sympathetic division of the autonomic nervous system (ANS) is suppressed during meditation, creating a more relaxed physiological state as the meditator moves into deeper states of relaxation and consciousness.

Research has found that regular meditation can mediate the effects of stress and depression, and promote well-being (Grossman, Niemann, Schmidt, & Walach, 2004; Reibel, Greeson, Brainard, & Rosenzweig, 2001; Salmon et al., 2004).[27]Meditation has also been shown to assist in controlling blood pressure (Barnes, Treiber, & Davis, 2001; Walton et al., 2004).[28] A study by Lyubimov (1992)[29] showed that during meditation, a larger area of the brain was responsive to sensory stimuli, suggesting that there is greater coordination between the two brain hemispheres as a result of meditation. Lutz and others (2004)[30]demonstrated that those who meditate regularly (as opposed to those who do not) tend to utilize a greater part of their brain and that their gamma waves are faster and more powerful. And a study of Tibetan Buddhist monks who meditate daily found that several areas of the brain can be permanently altered by the long-term practice of meditation (Lutz, Greischar, Rawlings, Ricard, & Davidson, 2004).[31]

It is possible that the positive effects of meditation could also be found by using other methods of relaxation. Although advocates of meditation claim that meditation enables people to attain a higher and purer consciousness, perhaps any kind of activity that calms and relaxes the mind, such as working on crossword puzzles, watching television or movies, or engaging in other enjoyed behaviors, might be equally effective in creating positive outcomes. Regardless of the debate, the fact remains that meditation is, at the very least, a worthwhile relaxation strategy.

Psychology in Everyday Life: The Need to Escape Everyday Consciousness

We may use recreational drugs, drink alcohol, overeat, have sex, and gamble for fun, but in some cases these normally pleasurable behaviors are abused, leading to exceedingly negative consequences for us. We frequently refer to the abuse of any type of pleasurable behavior as an “addiction,” just as we refer to drug or alcohol addiction.

The removal of self-awareness has also been depicted as the essential part of the appeal of masochism, in which people engage in bondage and other aspects of submission. Masochists are frequently tied up using ropes, scarves, neckties, stockings, handcuffs, and gags, and the outcome is that they no longer feel that they are in control of themselves, which relieves them from the burdens of the self (Baumeister, 1991).[36]

Newman and Baumeister (1996)[37] have argued that even the belief that one has been abducted by aliens may be driven by the need to escape everyday consciousness. Every day at least several hundred (and more likely several thousand) Americans claim that they are abducted by these aliens, although most of these stories occur after the individuals have consulted with a psychotherapist or someone else who believes in alien abduction. Again, Baumeister and his colleagues have found a number of indications that people who believe that they have been abducted may be using the belief as a way of escaping self-consciousness.

KEY TAKEAWAYS

- Hypnosis is a trance-like state of conscious consisting of heightened susceptibility, deep relaxation, and intense focus.
- Hypnosis is not useful for helping people remember past events, but it can be used to alleviate anxiety and pain.
- Sensory deprivation is the intentional reduction of stimulation to one or more of the senses. It can be used therapeutically to treat insomnia, muscle tension, and pain.
- Meditation refers to a range of techniques that can create relaxation and well-being.

EXERCISES AND CRITICAL THINKING

1. Do you think that you would be a good candidate for hypnosis? Why or why not?
2. Try the meditation exercise in this section for three consecutive days. Do you feel any different when or after you meditate?

[1] Hammond, D. C. (2008). Hypnosis as sole anesthesia for major surgeries: Historical & contemporary perspectives. *American Journal of Clinical Hypnosis, 51*(2), 101–121.

[2] Callahan, J. (1997). Hypnosis: Trick or treatment? You'd be amazed at what modern doctors are tackling with an 18th century gimmick. *Health, 11,* 52–55.

[3] Nash, M., & Barnier, A. (2008). *The Oxford handbook of hypnosis: Theory, research and practice*: New York, NY: Oxford University Press.

[4] Baker, E. L., & Nash, M. R. (2008). Psychoanalytic approaches to clinical hypnosis. In M. R. Nash & A. J. Barnier (Eds.), *The Oxford handbook of hypnosis: Theory, research, and practice* (pp. 439–456). New York, NY: Oxford University Press.

[5] Hilgard, E. R. (1965). *Hypnotic susceptibility*. New York, NY: Harcourt, Brace & World.

[6] Spiegel, H., Greenleaf, M., & Spiegel, D. (2005). Hypnosis. In B. J. Sadock & V. A. Sadock (Eds.), *Kaplan & Sadock's comprehensive textbook of psychiatry*. Philadelphia, PA: Lippincott Williams & Wilkins.

[7] Spanos, N. P. (1991). A sociocognitive approach to hypnosis. In S. J. Lynn & J. W. Rhue (Eds.), *Theories of hypnosis: Current models and perspectives,* New York, NY: Guilford Press.

[8] Fassler, O., Lynn, S. J., Knox, J. (2008). Is hypnotic suggestibility a stable trait?*Consciousness and Cognition: An International Journal. 17*(1), 240–253.

[9] Kinnunen, T., Zamansky, H. S., & Block, M. L. (1994). Is the hypnotized subject lying?*Journal of Abnormal Psychology, 103,* 184–191.

[10] Jamieson, G. A., & Hasegawa, H. (2007). New paradigms of hypnosis research. Hypnosis and conscious states: The cognitive neuroscience perspective. In G.A. Jamieson (Ed.), *Hypnosis and conscious states: The cognitive neuroscience perspective* (pp. 133–144). New York, NY: Oxford University Press.

[11] Kirsch, I., & Braffman, W. (2001). Imaginative suggestibility and hypnotizability.*Current Directions in Psychological Science. 10*(2), 57–61.

[12] Orne, M. T., & Evans, F. J. (1965). Social control in the psychological experiment: Antisocial behavior and hypnosis. *Journal of Personality and Social Psychology, 1*(3), 189–200.

[13] Hilgard, E. R., & Cooper, L. M. (1965). Spontaneous and suggested posthypnotic amnesia. *International Journal of Clinical and Experimental Hypnosis, 13*(4), 261–273.

[14] Silverman, P. S., & Retzlaff, P. D. (1986). Cognitive stage regression through hypnosis: Are earlier cognitive stages retrievable? *International Journal of Clinical and Experimental Hypnosis, 34*(3), 192–204.

[15] Newman, L. S., & Baumeister, R. F. (1996). Toward an explanation of the UFO abduction phenomenon: Hypnotic elaboration, extraterrestrial sadomasochism, and spurious memories. *Psychological Inquiry, 7*(2), 99–126.

[16] Kirsch, I., Montgomery, G., & Sapirstein, G. (1995). Hypnosis as an adjunct to cognitive-behavioral psychotherapy: A meta-analysis. *Journal of Consulting and Clinical Psychology, 63*(2), 214–220.

Meditation refers to techniques in which the individual focuses on something specific, such as an object, a word, or one‘s breathing, with the goal of ignoring external distractions. Meditation has a variety of positive health effects.

Once the zygote attaches to the wall of the uterus, it is known as the embryo. During the embryonic phase, which will last for the next 6 weeks, the major internal and external organs are formed, each beginning at the microscopic level, with only a few cells. The changes in the embryo‘s appearance will continue rapidly from this point until birth.

While the inner layer of embryonic cells is busy forming the embryo itself, the outer layer is forming the surrounding protective environment that will help the embryo survive the pregnancy. This environment consists of three major structures: The amniotic sac is *the fluid-filled reservoir in which the embryo (soon to be known as a fetus) will live until birth, and which acts as both a cushion against outside pressure and as a temperature regulator*. Theplacenta is *an organ that allows the exchange of nutrients between the embryo and the mother, while at the same time filtering out harmful material*. The filtering occurs through a thin membrane that separates the mother‘s blood from the blood of the fetus, allowing them to share only the material that is able to pass through the filter. Finally, the umbilical cord *links the embryo directly to the placenta and transfers all material to the fetus*. Thus the placenta and the umbilical cord protect the fetus from many foreign agents in the mother‘s system that might otherwise pose a threat.

The Fetus

Beginning in the 9th week after conception, the embryo becomes a fetus. The defining characteristic of the fetal stage is growth. All the major aspects of the growing organism have been formed in the embryonic phase, and now the fetus has approximately six months to go from weighing less than an ounce to weighing an average of 6 to 8 pounds. That‘s quite a growth spurt.

The fetus begins to take on many of the characteristics of a human being, including moving (by the 3rd month the fetus is able to curl and open its fingers, form fists, and wiggle its toes), sleeping, as well as early forms of swallowing and breathing. The fetus begins to develop its senses, becoming able to distinguish tastes and respond to sounds. Research has found that the fetus even develops some initial preferences. A newborn prefers the mother‘s voice to that of a stranger, the languages heard in the womb over other languages (DeCasper & Fifer, 1980; Moon,

During the sensorimotor stage, babies‘ use of their senses to perceive the world is so central to their understanding that whenever babies do not directly perceive objects, as far as they are concerned, the objects do not exist. Piaget found, for instance, that if he first interested babies in a toy and then covered the toy with a blanket, children who were younger than 6 months of age would act as if the toy had disappeared completely—they never tried to find it under the blanket but would nevertheless smile and reach for it when the blanket was removed. Piaget found that it was not until about 8 months that the children realized that the object was merely covered and not gone. Piaget used the term object permanence to refer to *the child’s ability to know that an object exists even when the object cannot be perceived*.

Video Clip: Object Permanence

Children younger than about 8 months of age do not understand object permanence.

At about 2 years of age, and until about 7 years of age, children move into thepreoperational stage. During this stage, *children begin to use language and to think more abstractly about objects, but their understanding is more intuitive than without much ability to deduce or reason*. The thinking is preoperational, meaning that the child lacks the ability to operate on or transform objects mentally. In one study that showed the extent of this inability, Judy DeLoache (1987) [10] showed children a room within a small dollhouse. Inside the room, a small toy was visible behind a small couch. The researchers took the children to another lab room, which was an exact replica of the dollhouse room, but full-sized. When children who were 2.5 years old were asked to find the toy, they did not know where to look—they were simply unable to make the transition across the changes in room size. Three-year-old children, on the other hand, immediately looked for the toy behind the couch, demonstrating that they were improving their operational skills.

The inability of young children to view transitions also leads them to be *egocentric*—unable to readily see and understand other people‘s viewpoints. Developmental psychologists define the theory of mind as *the ability to take another person’s viewpoint*, and the ability to do so

might be a problem. The two groups of adults necessarily grew up in different time periods, and they may have been differentially influenced by societal experiences, such as economic hardship, the presence of wars, or the introduction of new technology. As a result, it is difficult in cross-sectional studies such as this one to determine whether the differences between the groups (e.g., in terms of the relative roles of environment and genetics) are due to age or to other factors.

KEY TAKEAWAYS

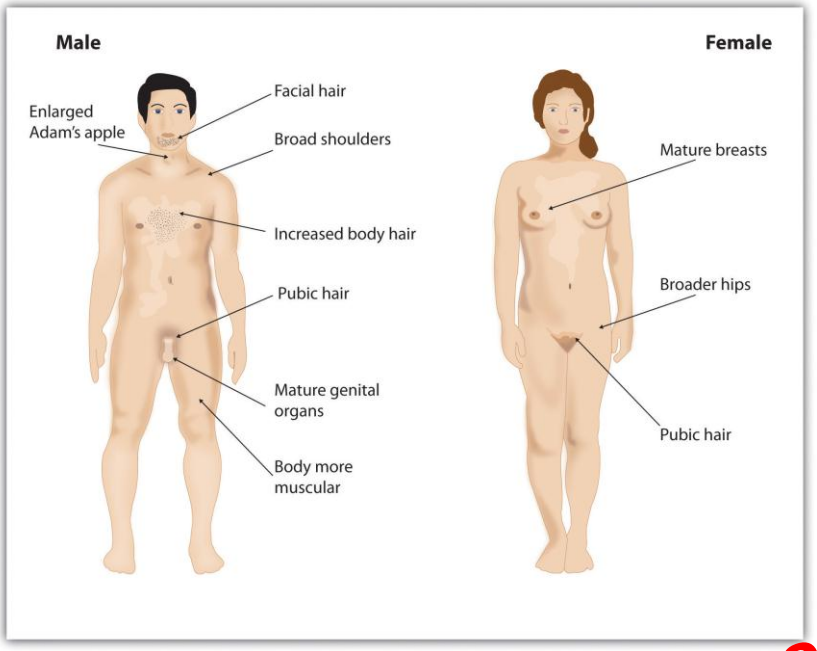
- Babies are born with a variety of skills and abilities that contribute to their survival, and they also actively learn by engaging with their environments.
- The habituation technique is used to demonstrate the newborn's ability to remember and learn from experience.
- Children use both assimilation and accommodation to develop functioning schemas of the world.
- Piaget's theory of cognitive development proposes that children develop in a specific series of sequential stages: sensorimotor, preoperational, concrete operational, and formal operational.
- Piaget's theories have had a major impact, but they have also been critiqued and expanded.
- Social development requires the development of a secure base from which children feel free to explore. Attachment styles refer to the security of this base and more generally to the type of relationship that people, and especially children, develop with those who are important to them.
- Longitudinal and cross-sectional studies have each used to test hypotheses about development, and each approach has advantages and disadvantages.

EXERCISES AND CRITICAL THINKING

1. Give an example of a situation in which you or someone else might show cognitive assimilation and cognitive accommodation. In what cases do you think each process is most likely to occur?
2. Consider some examples of how Piaget's and Vygotsky's theories of cognitive development might be used by teachers who are teaching young children.
3. Consider the attachment styles of some of your friends in terms of their relationships with their parents and other friends. Do you think their style is secure?

[1] Beauchamp, D. K., Cowart, B. J., Menellia, J. A., & Marsh, R. R. (1994). Infant salt taste: Developmental, methodological, and contextual factors. *Developmental Psychology, 27*, 353–365; Blass, E. M., & Smith, B. A. (1992). Differential effects of sucrose,

Figure 6.9 *Sex Characteristics*



Puberty brings dramatic changes in the body, including the development of primary and secondary sex characteristics.

A major milestone in puberty for girls is menarche, *the first menstrual period*, typically experienced at around 12 or 13 years of age (Anderson, Dannal, & Must, 2003).[5] The age of menarche varies substantially and is determined by genetics, as well as by diet and lifestyle, since a certain amount of body fat is needed to attain menarche. Girls who are very slim, who engage in strenuous athletic activities, or who are malnourished may begin to menstruate later. Even after menstruation begins, girls whose level of body fat drops below the critical level may stop having their periods. The sequence of events for puberty is more predictable than the age at which they occur. Some girls may begin to grow pubic hair at age 10 but not attain menarche until age 15. In boys, facial hair may not appear until 10 years after the initial onset of puberty.

The timing of puberty in both boys and girls can have significant psychological consequences. Boys who mature earlier attain some social advantages because they are taller and stronger and,

Table 6.4 James Marcia's Stages of Identity Development

Identity-diffusion status	The individual does not have firm commitments regarding the issues in question and is not making progress toward them.
Foreclosure status	The individual has not engaged in any identity experimentation and has established an identity based on the choices or values of others.
Moratorium status	The individual is exploring various choices but has not yet made a clear commitment to any of them.
Identity-achievement status	The individual has attained a coherent and committed identity based on personal decisions.

Source: Adapted from Marcia, J. (1980). Identity in adolescence. *Handbook of adolescent psychology, 5*, 145–160.

Studies assessing how teens pass through Marcia's stages show that, although most teens eventually succeed in developing a stable identity, the path to it is not always easy and there are many routes that can be taken. Some teens may simply adopt the beliefs of their parents or the first role that is offered to them, perhaps at the expense of searching for other, more promising possibilities (foreclosure status). Other teens may spend years trying on different possible identities (moratorium status) before finally choosing one.

To help them work through the process of developing an identity, teenagers may well try out different identities in different social situations. They may maintain one identity at home and a different type of persona when they are with their peers. Eventually, most teenagers do integrate the different possibilities into a single self-concept and a comfortable sense of identity (identity-achievement status).

For teenagers, the peer group provides valuable information about the self-concept. For instance, in response to the question"What were you like as a teenager? (e.g., cool, nerdy, awkward?)," posed on the website Answerbag, one teenager replied in this way:

I'm still a teenager now, but from 8th–9th grade I didn't really know what I wanted at all. I was smart, so I hung out with the nerdy kids. I still do; my friends mean the world to me. But in the

middle of 8th I started hanging out with whom you may call the "cool" kids…and I also hung out with some stoners, just for variety. I pierced various parts of my body and kept my grades up. Now, I'm just trying to find who I am. I'm even doing my sophomore year in China so I can get a better view of what I want. (Answerbag, 2007) [20]

Responses like this one demonstrate the extent to which adolescents are developing their self-concepts and self-identities and how they rely on peers to help them do that. The writer here is trying out several (perhaps conflicting) identities, and the identities any teen experiments with are defined by the group the person chooses to be a part of. The friendship groups (cliques, crowds, or gangs) that are such an important part of the adolescent experience allow the young adult to try out different identities, and these groups provide a sense of belonging and acceptance (Rubin, Bukowski, & Parker, 2006). [21] A big part of what the adolescent is learning is social identity, *the part of the self-concept that is derived from one's group memberships*. Adolescents define their social identities according to how they are similar to and differ from others, finding meaning in the sports, religious, school, gender, and ethnic categories they belong to.

Developing Moral Reasoning: Kohlberg's Theory

The independence that comes with adolescence requires independent thinking as well as the development of *morality*—standards of behavior that are generally agreed on within a culture to be right or proper. Just as Piaget believed that children's cognitive development follows specific patterns, Lawrence Kohlberg (1984) [22] argued that children learn their moral values through active thinking and reasoning, and that moral development follows a series of stages. To study moral development, Kohlberg posed moral dilemmas to children, teenagers, and adults, such as the following:

A man's wife is dying of cancer and there is only one drug that can save her. The only place to get the drug is at the store of a pharmacist who is known to overcharge people for drugs. The man can only pay $1,000, but the pharmacist wants $2,000, and refuses to sell it to him for less,

relationship, and we develop an interest in guiding the development of the next generation, often by becoming parents.

Psychology in Everyday Life: What Makes a Good Parent?

One thing that you may have wondered about as you grew up, and which you may start to think about again if you decide to have children yourself, concerns the skills involved in parenting. Some parents are strict, others are lax; some parents spend a lot of time with their kids, trying to resolve their problems and helping to keep them out of dangerous situations, whereas others leave their children with nannies or in day care. Some parents hug and kiss their kids and say that they love them over and over every day, whereas others never do. Do these behaviors matter? And what makes a "good parent"?

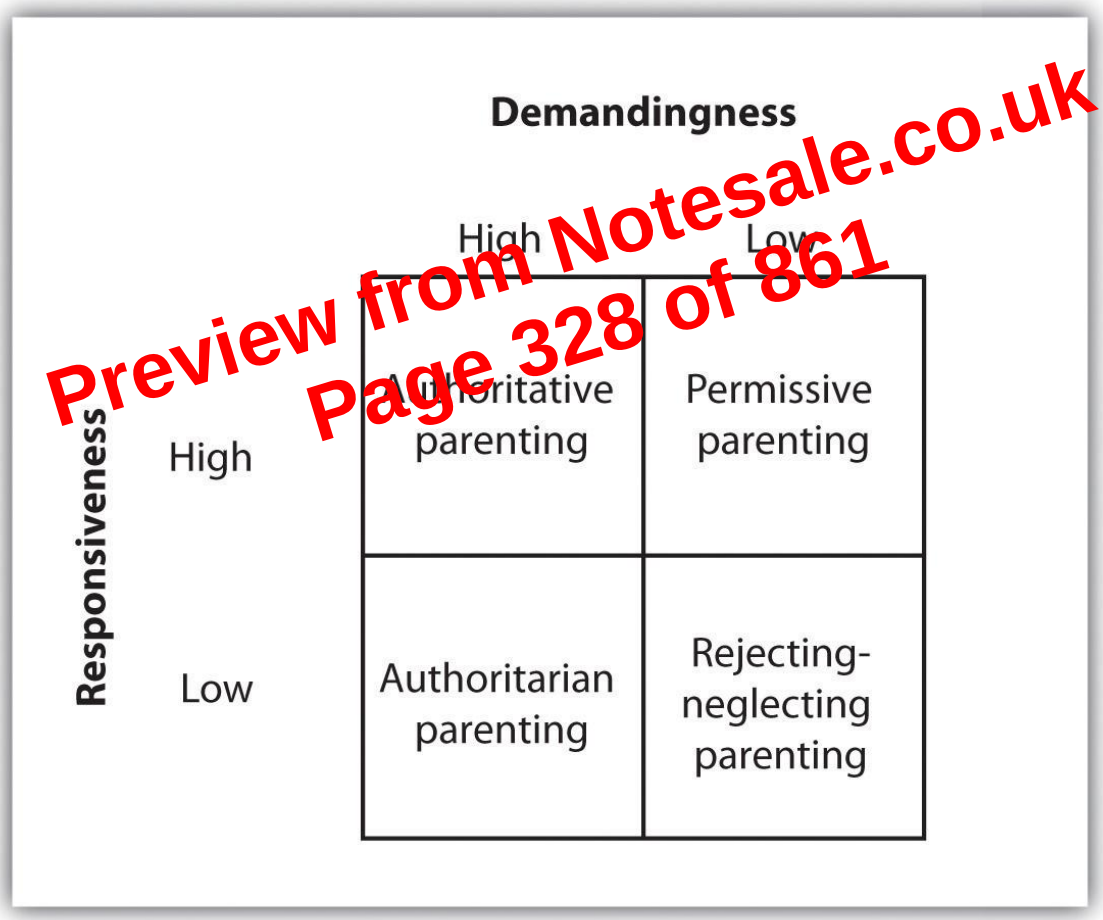
We have already considered two answers to this question, in the form of what all children require: (1) babies need a conscientious mother who does not smoke, drink, or use drugs during her pregnancy, and (2) infants need caretakers who are consistently available, loving, and supportive to help them form a secure base. One case in which these basic goals are less likely to be met is when the mother is an adolescent. Adolescent mothers are more likely to use drugs and alcohol during their pregnancies, to have poor parenting skills in general, and to provide insufficient support for the child (Ekéus, Christensson, & Hjern, 2004).[1] As a result, the babies of adolescent mothers have higher rates of academic failure, delinquency, and incarceration in comparison to children of older mothers (Moore & Brooks-Gunn, 2002).[2]

Normally, it is the mother who provides early attachment, but fathers are not irrelevant. In fact, studies have found that children whose fathers are more involved tend to be more cognitively and socially competent, more empathic, and psychologically better adjusted, compared with children whose fathers are less involved (Rohner & Veneziano, 2001).[3] In fact, Amato (1994)[4] found that, in some cases, the role of the father can be as or even more important than that of the mother in the child's overall psychological health and well-being. Amato concluded, "Regardless of the quality of the mother-child relationship, the closer adult offspring were to their fathers, the happier, more satisfied, and less distressed they reported being" (p. 1039).

As the child grows, parents take on one of four types ofparenting styles—*parental behaviors that determine the nature of parent-child interactions* and that guide their interaction with the child. These styles depend on whether the parent is more or less *demanding* and more or less *responsive* to the child (see Figure 6.11 "Parenting

Styles").*Authoritarian parents* are demanding but not responsive. They impose rules and expect obedience, tending to give orders ("Eat your food!") and enforcing their commands with rewards and punishment, without providing any explanation of where the rules came from, except "Because I said so!" *Permissive parents*, on the other hand, tend to make few demands and give little punishment, but they are responsive in the sense that they generally allow their children to make their own rules. *Authoritative parents* are demanding ("You must be home by curfew"), but they are also responsive to the needs and opinions of the child ("Let's discuss what an appropriate curfew might be"). They set rules and enforce them, but they also explain and discuss the reasons behind the rules. Finally, *rejecting-neglecting parents* are undemanding and unresponsive overall.

*Figure 6.11*Parenting Styles



LEARNING OBJECTIVES

1. Review the physical, cognitive, and social changes that accompany late adulthood.
2. Describe the psychological and physical outcomes of bereavement.

We have seen that, over the course of their lives, most individuals are able to develop secure attachments; reason cognitively, socially and morally; and create families and find appropriate careers. Eventually, however, as people enter into their 60s and beyond, the aging process leads to faster changes in our physical, cognitive, and social capabilities and needs, and life begins to come to its natural conclusion, resulting in *the final life stage, beginning in the 60s*, known as late adulthood.

Despite the fact that the body and mind are slowing, most older adults nevertheless maintain an active lifestyle, remain as happy or are happier than when they were younger, and increasingly value their social connections with family and friends (Angner, Ray, Saag, & Allison, 2009). [1] Kennedy, Mather, and Carstensen (2004) [2] found that people's memories of their lives became more positive with age, and Myers and Diener (1996) [3] found that older adults tended to speak more positively about events in their lives, particularly their relationships with friends and family, than did younger adults.

Cognitive Changes During Aging

The changes associated with aging do not affect everyone in the same way, and they do not necessarily interfere with a healthy life. Former Beatles drummer Ringo Starr celebrated his 70th birthday in 2010 by playing at Radio City Music Hall, and Rolling Stones singer Mick Jagger (who once supposedly said, "I'd rather be dead than singing Satisfaction' at 45") continues to perform as he pushes 70. The golfer Tom Watson almost won the 2010 British Open golf tournament at the age of 59, playing against competitors in their 20s and 30s. And people such as the financier Warren Buffet, U.S. Senator Frank Lautenberg, and actress Betty White, each in their 80s, all enjoy highly productive and energetic lives.

Chapter 7
Learning

My Story of Posttraumatic Stress Disorder

It is a continuous challenge living with post-traumatic stress disorder (PTSD), and I've suffered from it for most of my life. I can look back now and gently laugh at all the people who thought I had the perfect life. I was young, beautiful, and talented, but unbeknownst to them, I was terrorized by an undiagnosed debilitating mental illness.

Having been properly diagnosed with PTSD at age 35, I know that there is not one aspect of my life that has gone untouched by this mental illness. My PTSD was triggered by several traumas, most importantly a sexual attack at knifepoint that left me thinking I would die. I would never be the same after that attack. For me there was no safe place in the world, not even my home. I went to the police and filed a report. Rape counselors came to see me while I was in the hospital, but I declined their help, convinced that I didn't need it. This would be the most damaging decision of my life.

For months after the attack, I couldn't close my eyes without seeing the face of my attacker. I suffered horrific flashbacks and nightmares. For four years after the attack I was unable to sleep alone in my house. I obsessively checked windows, doors, and locks. By age 17, I'd suffered my first panic attack. Soon I became unable to leave my apartment for weeks at a time, ending my modeling career abruptly. This just became a way of life. Years passed when I had few or no symptoms at all, and I led what I thought was a fairly normal life, just thinking I had a "panic problem."

Then another traumatic event retriggered the PTSD. It was as if the past had evaporated, and I was back in the place of my attack, only now I had uncontrollable thoughts of someone entering my house and harming my daughter. I saw violent images every time I closed my eyes. I lost all ability to concentrate or even complete simple tasks. Normally social, I stopped trying to make friends or get involved in my community. I often felt disoriented, forgetting where, or who, I was. I would panic on the freeway and became unable to drive, again ending a career. I felt as if I had completely lost my mind. For a time, I managed to keep it together on the outside, but then I became unable to leave my house again.

they knew that they were about to be fed; the dogs had begun to associate the arrival of the technicians with the food that soon followed their appearance in the room.

With his team of researchers, Pavlov began studying this process in more detail. He conducted a series of experiments in which, over a number of trials, dogs were exposed to a sound immediately before receiving food. He systematically controlled the onset of the sound and the timing of the delivery of the food, and recorded the amount of the dogs' salivation. Initially the dogs salivated only when they saw or smelled the food, but after several pairings of the sound and the food, the dogs began to salivate as soon as they heard the sound. The animals had learned to associate the sound with the food that followed.

Pavlov had identified a fundamental associative learning process called *classical conditioning*. Classical conditioning refers to *learning that occurs when a neutral stimulus (e.g., a tone) becomes associated with a stimulus (e.g., food) that naturally produces a behavior*. After the association is learned, the previously neutral stimulus is sufficient to produce the behavior.

As you can see in Figure 7.3 "4-Panel Image of Whistle and Dog", psychologists use specific terms to identify the stimuli and the responses in classical conditioning.
The unconditioned stimulus (US) is *something (such as food) that triggers a natural occurring response*, and the unconditioned response (UR) is *the naturally occurring response (such as salivation) that follows the unconditioned stimulus*. The conditioned stimulus (CS) is *a neutral stimulus that, after being repeatedly presented prior to the unconditioned stimulus, evokes a similar response as the unconditioned stimulus*. In Pavlov's experiment, the sound of the tone served as the conditioned stimulus that, after learning, produced the conditioned response (CR), which is *the acquired response to the formerly neutral stimulus*. Note that the UR and the CR are the same behavior—in this case salivation—but they are given different names because they are produced by different stimuli (the US and the CS, respectively).

Figure 7.3 *4-Panel Image of Whistle and Dog*

At first the cats scratched, bit, and swatted haphazardly, without any idea of how to get out. But eventually, and accidentally, they pressed the lever that opened the door and exited to their prize, a scrap of fish. The next time the cat was constrained within the box it attempted fewer of the ineffective responses before carrying out the successful escape, and after several trials the cat learned to almost immediately make the correct response.

Observing these changes in the cats‘ behavior led Thorndike to develop hislaw of effect, *the principle that responses that create a typically pleasant outcome in a particular situation are more likely to occur again in a similar situation, whereas responses that produce a typically unpleasant outcome are less likely to occur again in the situation* (Thorndike, 1911).[2] The essence of the law of effect is that successful responses, because they are pleasurable, are "stamped in" by experience and thus occur more frequently. Unsuccessful responses, which produce unpleasant experiences, are "stamped out" and subsequently occur less frequently.

Video Clip: Thorndike's Puzzle Box

When Thorndike placed his cats in a puzzle box, he found that they learned to engage in the important escape behavior faster after each trial. Thorndike described the learning that follows reinforcement in terms of the law of effect.

The influential behavioral psychologist B. F. Skinner (1904–1990) expanded on Thorndike‘s ideas to develop a more complete set of principles to explain operant conditioning. Skinner created specially designed environments known as *operant chambers* (usually called *Skinner boxes*) to systemically study learning. A Skinner box (operant chamber) is *a structure that is big enough to fit a rodent or bird and that contains a bar or key that the organism can press or peck to release food or water. It also contains a device to record the animal's responses*.

The most basic of Skinner‘s experiments was quite similar to Thorndike‘s research with cats. A rat placed in the chamber reacted as one might expect, scurrying about the box and sniffing and clawing at the floor and walls. Eventually the rat chanced upon a lever, which it pressed to

b. *The Big Bang Theory*: http://www.youtube.com/watch?v=JA96Fba-WHk

[1] Thorndike, E. L. (1898). *Animal intelligence: An experimental study of the associative processes in animals.* Washington, DC: American Psychological Association.

[2] Thorndike, E. L. (1911). *Animal intelligence: Experimental studies.* New York, NY: Macmillan. Retrieved from http://www.archive.org/details/animalintelligen00thor

[3] Cerella, J. (1980). The pigeon's analysis of pictures. *Pattern Recognition, 12*, 1–6.

[4] Porter, D., & Neuringer, A. (1984). Music discriminations by pigeons. *Journal of Experimental Psychology: Animal Behavior Processes, 10*(2), 138–148; Watanabe, S., Sakamoto, J., & Wakita, M. (1995). Pigeons' discrimination of painting by Monet and Picasso. *Journal of the Experimental Analysis of Behavior, 63*(2), 165–174.

7.3 Learning by Insight and Observation

LEARNING OBJECTIVE

1. Understand the principles of learning by insight and observation.

John B. Watson and B. F. Skinner were behaviorists who believed that all learning could be explained by the processes of conditioning—that is, that associations, and associations alone, influence learning. But some kinds of learning are very difficult to explain using only conditioning. Thus, although classical and operant conditioning play a key role in learning, they constitute only a part of the total picture.

One type of learning that is not determined only by conditioning occurs when we suddenly find the solution to a problem, as if the idea just popped into our head. This type of learning is known as insight, *the sudden understanding of a solution to a problem*. The German psychologist Wolfgang Köhler (1925)[1] carefully observed what happened when he presented chimpanzees with a problem that was not easy for them to solve, such as placing food in an area that was too high in the cage to be reached. He found that the chimps first engaged in trial-and-error attempts at solving the problem, but when these failed they seemed to stop and contemplate for a while. Then, after this period of contemplation, they would suddenly seem to know how to solve the problem, for instance by using a stick to knock the food down or by standing on a chair to reach

aggression. The studies included both experimental and correlational studies, with both male and female participants in both laboratory and field settings. They found that exposure to violent video games is significantly linked to increases in aggressive thoughts, aggressive feelings, psychological arousal (including blood pressure and heart rate), as well as aggressive behavior. Furthermore, playing more video games was found to relate to less altruistic behavior. In one experiment, Bushman and Anderson (2002)[11] assessed the effects of viewing violent video games on aggressive thoughts and behavior. Participants were randomly assigned to play either a violent or a nonviolent video game for 20 minutes. Each participant played one of four violent video games (Carmageddon, Duke Nukem, Mortal Kombat, or Future Cop) or one of four nonviolent video games (Glider Pro, 3D Pinball, Austin Powers, or Tetra Madness).

Participants then read a story, for instance this one about Todd, and were asked to list 20 thoughts, feelings, and actions about how they would respond if they were Todd:

> *Todd was on his way home from work one evening when he had to brake quickly for a yellow light. The person in the car behind him must have thought Todd was going to run the light because he crashed into the back of Todd's car, causing a lot of damage to both vehicles. Fortunately, there were no injuries. Todd got out of his car and surveyed the damage. He then walked over to the other car.*

As you can see in Figure 7.9 "Results From Bushman and Anderson, 2002", the students who had played one of the violent video games responded much more aggressively to the story than did those who played the nonviolent games. In fact, their responses were often extremely aggressive. They said things like "Call the guy an idiot," "Kick the other driver's car," "This guy's dead meat!" and "What a dumbass!"

Figure 7.9 Results From Bushman and Anderson, 2002

[11] Bushman, B. J., & Anderson, C. A. (2002). Violent video games and hostile expectations: A test of the general aggression model. *Personality and Social Psychology Bulletin, 28*(12), 1679–1686.

[12] Seymour, B., Yoshida W., & Dolan, R. (2009) Altruistic learning. *Frontiers in Behavioral Neuroscience, 3*, 23. doi:10.3389/neuro.07.023.2009

7.4 Using the Principles of Learning to Understand Everyday Behavior

LEARNING OBJECTIVES

1. Review the ways that learning theories can be applied to understanding and modifying everyday behavior.
2. Describe the situations under which reinforcement may make people *less* likely to enjoy engaging in a behavior.
3. Explain how principles of reinforcement are used to understand social dilemmas such as the prisoner's dilemma and why people are likely to make competitive choices in them.

The principles of learning are some of the most general and most powerful in all of psychology. It would be fair to say that these principles account for more behavior using fewer principles than any other set of psychological theories. The principles of learning are applied in numerous ways in everyday settings. For example, operant conditioning has been used to motivate employees, to improve athletic performance, to increase the functioning of those suffering from developmental disabilities, and to help parents successfully toilet train their children (Simek & O'Brien, 1981; Pedalino & Gamboa, 1974; Azrin & Foxx, 1974; McGlynn, 1990).[1] In this section we will consider how learning theories are used in advertising, in education, and in understanding competitive relationships between individuals and groups.

Using Classical Conditioning in Advertising

Classical conditioning has long been, and continues to be, an effective tool in marketing and advertising (Hawkins, Best, & Coney, 1998).[2] The general idea is to create an advertisement that has positive features such that the ad creates enjoyment in the person exposed to it. The enjoyable ad serves as the unconditioned stimulus (US), and the enjoyment is the unconditioned response (UR). Because the product being advertised is mentioned in the ad, it becomes

dilemma by short-term rewards, seemingly without considering the potential long-term costs of the behavior, such as air pollution and the necessity of building even more highways.

A social dilemma such as the commons dilemma is *a situation in which the behavior that creates the most positive outcomes for the individual may in the long term lead to negative consequences for the group as a whole*. The dilemmas are arranged in a way that it is easy to be selfish, because the personally beneficial choice (such as using water during a water shortage or driving to work alone in one's own car) produces reinforcements for the individual. Furthermore, social dilemmas tend to work on a type of "time delay." The problem is that, because the long-term negative outcome (the extinction of fish species or dramatic changes in the earth's climate) is far away in the future and the individual benefits are occurring right now, it is difficult for an individual to see how many costs there really are. The paradox, of course, is that if everyone takes the personally selfish choice in an attempt to maximize his or her own outcomes, the long-term result is poorer outcomes for every individual in the group. Each individual prefers to make use of the public goods for himself or herself, whereas the best outcome for the group as a whole is to use the resources more slowly and wisely.

One method of understanding how individuals and groups behave in social dilemmas is to create such situations in the laboratory and observe how people react to them. The best known of these laboratory simulations is called theprisoner's dilemma game (Poundstone, 1992).[17] This game *represents a social dilemma in which the goals of the individual compete with the goals of another individual (or sometimes with a group of other individuals)*. Like all social dilemmas, the prisoner's dilemma assumes that individuals will generally try to maximize their own outcomes in their interactions with others.

In the prisoner's dilemma game, the participants are shown a *payoff matrix* in which numbers are used to express the potential outcomes for each of the players in the game, given the decisions each player makes. The payoffs are chosen beforehand by the experimenter to create a situation that models some real-world outcome. Furthermore, in the prisoner's dilemma game, the payoffs are normally arranged as they would be in a typical social dilemma, such that each individual is

Perloff, R. M. (2003).*The dynamics of persuasion: Communication and attitudes in the 21st century* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates; Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior, 27*(5), 591–615.

[6] Schemer, C., Matthes, J. R., Wirth, W., & Textor, S. (2008). Does "Passing the Courvoisier" always pay off? Positive and negative evaluative conditioning effects of brand placements in music videos. *Psychology & Marketing, 25*(10), 923–943.

[7] Watson, J. B. (1930). *Behaviorism* (Rev. ed.). New York, NY: Norton.

[8] Skinner, B. F. (1965). The technology of teaching. *Proceedings of the Royal Society B Biological Sciences, 162*(989): 427–43. doi:10.1098/rspb.1965.0048

[9] Emurian, H. H. (2009). Teaching Java: Managing instructional tactics to optimize student learning. *International Journal of Information & Communication Technology Education, 3*(4), 34–49.

[10] Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest, 4*, 1–44.

[11] Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality & Social Psychology, 28*(1), 129–137.

[12] Hulleman, C. S., Durik, A. M., Schweigert, S. B., & Harackiewicz, J. M. (2008). Task values, achievement goals, and interest: An integrative analysis. *Journal of Educational Psychology, 100*(2), 398–416; Ryan, R. M., & Deci, E. L. (2002). Overview of self-determination theory: An organismic-dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3–33). Rochester, NY: University of Rochester Press.

[13] Gershoff, E. T. (2002). Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychological Bulletin, 128*(4), 539–579.

[14] Kohn, A. (1993). *Punished by rewards: The trouble with gold stars, incentive plans, A's, praise, and other bribes*. Boston, MA: Houghton Mifflin and Company.

[15] Rotter, J. B. (1945). *Social learning and clinical psychology*. Upper Saddle River, NJ: Prentice Hall; Bandura, A. (1977). *Social learning theory*. New York, NY: General Learning Press; Miller, N., & Dollard, J. (1941). *Social learning and imitation*. New Haven, CT: Yale University Press.

[16] Hardin, G. (1968). The tragedy of the commons. *Science, 162*, 1243–1248.

[17] Poundstone, W. (1992). *The prisoner's dilemma*. New York, NY: Doubleday.

7.5 Chapter Summary

Classical conditioning was first studied by physiologist Ivan Pavlov. In classical conditioning a person or animal learns to associate a neutral stimulus (the conditioned stimulus, or CS) with a stimulus (the unconditioned stimulus, or US) that naturally produces a behavior (the unconditioned response, or UR). As a result of this association, the previously neutral stimulus comes to elicit the same or similar response (the conditioned response, or CR).

Classically conditioned responses show extinction if the CS is repeatedly presented without the US. The CR may reappear later in a process known as spontaneous recovery.

Organisms may show stimulus generalization, in which stimuli similar to the CS may produce similar behaviors, or stimulus discrimination, in which the organism learns to differentiate between the CS and other similar stimuli.

Second-order conditioning occurs when a second CS is conditioned to a previously established CS.

Psychologist Edward Thorndike developed the law of effect: the idea that responses that are reinforced are "stamped in" by experience and thus occur more frequently, whereas responses that are punishing are "stamped out" and subsequently occur less frequently.

B. F. Skinner (1904–1990) expanded on Thorndike's ideas to develop a set of principles to explain operant conditioning.

Positive reinforcement strengthens a response by presenting a something pleasant after the response, and negative reinforcement strengthens a response by reducing or removing something unpleasant. Positive punishment weakens a response by presenting something unpleasant after the response, whereas negative punishment weakens a response by reducing or removing something pleasant.

Shaping is the process of guiding an organism‘s behavior to the desired outcome through the use of reinforcers.

Reinforcement may be either partial or continuous. Partial-reinforcement schedules are determined by whether the reward is presented on the basis of the time that elapses between rewards (interval) or on the basis of the number of responses that the organism engages in (ratio), and by whether the reinforcement occurs on a regular (fixed) or unpredictable (variable) schedule.

Not all learning can be explained through the principles of classical and operant conditioning. Insight is the sudden understanding of the components of a problem that makes the solution apparent, and latent learning refers to learning that is not reinforced and not demonstrated until there is motivation to do so.

Learning by observing the behavior of others and the consequences of those behaviors is known as observational learning. Aggression, altruism, and many other behaviors are learned through observation.

Learning theories can and have been applied to change behaviors in many areas of everyday life. Some advertising uses classical conditioning to associate a pleasant response with a product.

Rewards are frequently and effectively used in education but must be carefully designed to be contingent on performance and to avoid undermining interest in the activity.

Social dilemmas, such as the prisoner‘s dilemma, can be understood in terms of a desire to maximize one‘s outcomes in a competitive relationship.

_ o _ k

_ h _ i s _

Now read the following sentence carefully:

He got his materials from the shelves, checked them out, and then left the building."

Then try again to make words out of the word fragments.

I think you might find that it is easier to complete fragments 1 and 3 as "library" and "book," respectively, after you read the sentence than it was before you read it. However, reading the sentence didn't really help you to complete fragments 2 and 4 as "physician" and "chaise." This difference in implicit memory probably occurred because as you read the sentence, the concept of "library" (and perhaps "book") was primed, even though they were never mentioned explicitly. Once a concept is primed it influences our behaviors, for instance, on word fragment tests.

Our everyday behaviors are influenced by priming in a wide variety of situations. Seeing an advertisement for cigarettes may make us start smoking, seeing the flag of our home country may arouse our patriotism, and seeing a student from a rival school may arouse our competitive spirit. And these influences on our behaviors may occur without our being aware of them.

Research Focus: Priming Outside Awareness Influences Behavior

One of the most important characteristics of implicit memories is that they are frequently formed and used *automatically*, without much effort or awareness on our part. In one demonstration of the automaticity and influence of priming effects, John Bargh and his colleagues (Bargh, Chen, & Burrows, 1996)[5] conducted a study in which they showed college students lists of five scrambled words, each of which they were to make into a sentence. Furthermore, for half of the research participants, the words were related to stereotypes of the elderly. These participants saw words such as the following:

in Florida retired live people

2007).[10] Each of the following questions appears individually on a computer screen and then disappears after you answer the question:

Is 10 × 2 − 5 = 15? (Answer YES OR NO) Then remember "S"
Is 12 ’ 6 − 2 = 1? (Answer YES OR NO) Then remember "R"
Is 10 × 2 = 5? (Answer YES OR NO) Then remember "P"
Is 8 ’ 2 − 1 = 1? (Answer YES OR NO) Then remember "T"
Is 6 × 2 − 1 = 8? (Answer YES OR NO) Then remember "U"
Is 2 × 3 − 3 = 0? (Answer YES OR NO) Then remember "Q"

To successfully accomplish the task, you have to answer each of the math problems correctly and at the same time remember the letter that follows the task. Then, after the six questions, you must list the letters that appeared in each of the trials in the correct order (in this case S, R, P, T, U, Q).

To accomplish this difficult task you need to use a variety of skills. You clearly need to use STM, as you must keep the letters in storage until you are asked to list them. But you also need a way to make the best use of your available attention and processing. For instance, you might decide to use a strategy of "repeat the letters twice, then quickly solve the next problem, and then repeat the letters twice again including the new one." Keeping this strategy (or others like it) going is the role of working memory's *central executive*—the part of working memory that directs attention and processing. The central executive will make use of whatever strategies seem to be best for the given task. For instance, the central executive will direct the rehearsal process, and at the same time direct the visual cortex to form an image of the list of letters in memory. You can see that although STM is involved, the processes that we use to operate on the material in memory are also critical.

Short-term memory is limited in both the length and the amount of information it can hold. Peterson and Peterson (1959)[11] found that when people were asked to remember a list of three-letter strings and then were immediately asked to perform a distracting task (counting backward

One way to prevent the decay of information from short-term memory is to use working memory to rehearse it. Maintenance rehearsal is *the process of repeating information mentally or out loud with the goal of keeping it in memory*. We engage in maintenance rehearsal to keep a something that we want to remember (e.g., a person‘s name, e-mail address, or phone number) in mind long enough to write it down, use it, or potentially transfer it to long-term memory.

If we continue to rehearse information it will stay in STM until we stop rehearsing it, but there is also a capacity limit to STM. Try reading each of the following rows of numbers, one row at a time, at a rate of about one number each second. Then when you have finished each row, close your eyes and write down as many of the numbers as you can remember.

019

3586

10295

861059

1029384

75674834

657874104

6550423897

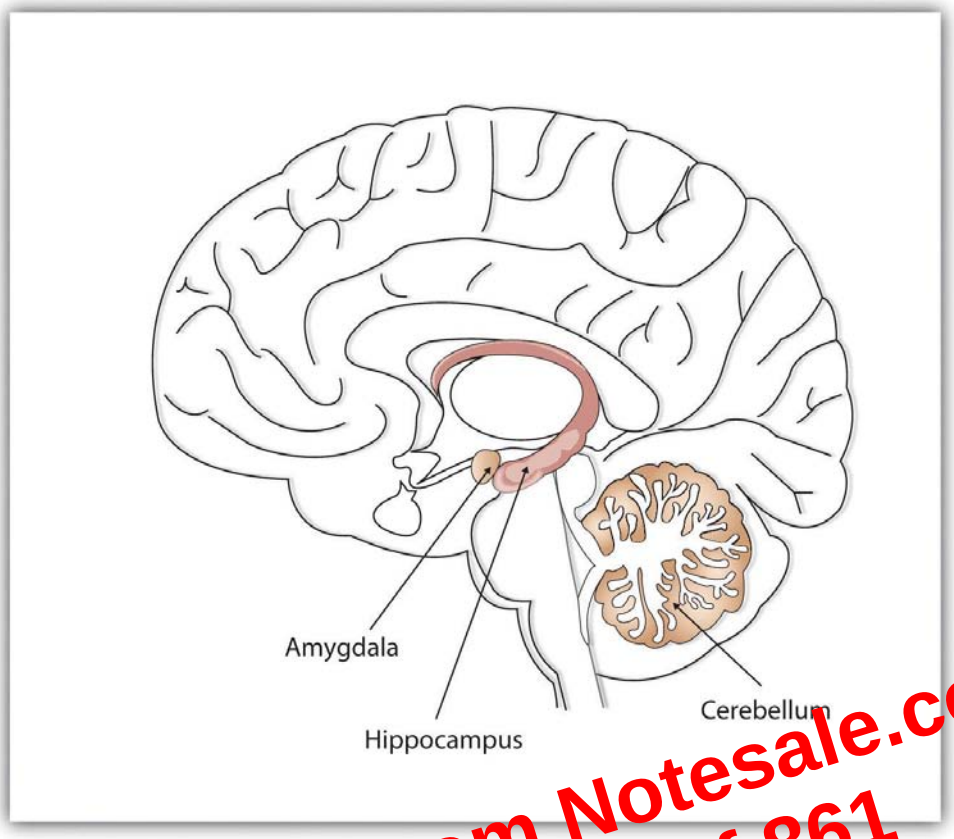
Schemas are important in part because they help us remember new information by providing an organizational structure for it. Read the following paragraph (Bransford & Johnson, 1972)[14] and then try to write down everything you can remember.

The procedure is actually quite simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities, that is the next step; otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important, but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed, one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life.

It turns out that people's memory for this information is quite poor, unless they have been told ahead of time that the information describes "doing the laundry," in which case their memory for the material is much better. This demonstration of the role of schemas in memory shows how our existing knowledge can help us organize new information, and how this organization can improve encoding, storage, and retrieval.

The Biology of Memory

Just as information is stored on digital media such as DVDs and flash drives, the information in LTM must be stored in the brain. The ability to maintain information in LTM involves a gradual strengthening of the connections among the neurons in the brain. When pathways in these neural networks are frequently and repeatedly fired, the synapses become more efficient in communicating with each other, and these changes create memory. This process, known as long-term potentiation (LTP), refers to *the strengthening of the synaptic connections between neurons*



Different brain structures help us remember different types of information. The hippocampus is particularly important in explicit memories, the cerebellum is particularly important in implicit memories, and the amygdala is particularly important in emotional memories.

While the hippocampus is handling explicit memory, the *cerebellum* and the *amygdala* are concentrating on implicit and emotional memories, respectively. Research shows that the cerebellum is more active when we are learning associations and in priming tasks, and animals and humans with damage to the cerebellum have more difficulty in classical conditioning studies (Krupa, Thompson, & Thompson, 1993; Woodruff-Pak, Goldenberg, Downey-Lamb, Boyko, & Lemieux, 2000).[20] The storage of many of our most important emotional memories, and particularly those related to fear, is initiated and controlled by the amygdala (Sigurdsson, Doyère, Cain, & LeDoux, 2007).[21]

Cognitive process	Description	Potential threat to accuracy
Misinformation effect	Errors in memory that occur when new but incorrect information influences existing accurate memories	Eyewitnesses who are questioned by the police may change their memories of what they observed at the crime scene.
Overconfidence	When we are more certain that our memories and judgments are accurate than we should be	Eyewitnesses may be very confident that they have accurately identified a suspect, even though their memories are incorrect.
Salience	When some stimuli, (e.g., those that are colorful, moving, or unexpected) grab our attention and make them more likely to be remembered	We may base our judgments on a single salient event while we ignore hundreds of other equally informative events that we do not see.
Representativeness heuristic	Tendency to make judgments according to how well the event matches our expectations	After a coin has come up "heads" many times in a row, we may erroneously think that the next flip is more likely to be "tails" (the gambler's fallacy).
Availability heuristic	Idea that things that come to mind easily are seen as more common	We may overestimate the crime statistics in our own area, because these crimes are so easy to recall.
Cognitive accessibility	Idea that some memories are more highly activated than others	We may think that we contributed more to a project than we really did because it is so easy to remember our own contributions.
Counterfactual thinking	When we "replay" events such that they turn out differently (especially when only minor changes in the events leading up to them make a difference)	We may feel particularly bad about events that might not have occurred if only a small change had occurred before them.

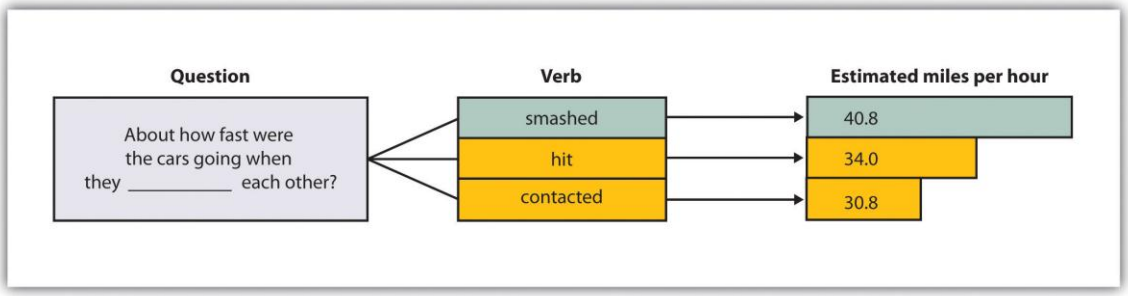
Source Monitoring: Did It Really Happen?

One potential error in memory involves mistakes in differentiating the sources of information. Source monitoring refers to *the ability to accurately identify the source of a memory*. Perhaps you've had the experience of wondering whether you really experienced an event or only dreamed or imagined it. If so, you wouldn't be alone. Rassin, Merkelbach, and Spaan (2001) [1] reported that up to 25% of college students reported being confused about real

“About how fast were the cars going when they hit each other?”
“About how fast were the cars going when they smashed each other?”
“About how fast were the cars going when they contacted each other?”

As you can see in Figure 8.20 "Misinformation Effect", although all the participants saw the same accident, their estimates of the cars‘ speed varied by condition. Participants who had been asked about the cars “smashing” each other estimated the highest average speed, and those who had been asked the “contacted” question estimated the lowest average speed.

Figure 8.20 *Misinformation Effect*



you wanted to buy a new music player for yourself. You've been trying to decide whether to get the iPod or the Zune. You checked *Consumer Reports* online and found that, although the players differed on many dimensions, including price, battery life, ability to share music, and so forth, the Zune was nevertheless rated significantly higher by owners than was the iPod. As a result, you decide to purchase the Zune the next day. That night, however, you go to a party, and a friend shows you her iPod. You check it out, and it seems really cool. You tell her that you were thinking of buying a Zune, and she tells you that you are crazy. She says she knows someone who had one and it had a lot of problems—it didn't download music correctly, the battery died right after the warranty expired, and so forth—and that she would never buy one. Would you still buy the Zune, or would you switch your plans?

If you think about this question logically, the information that you just got from your friend isn't really all that important. You now know the opinion of one more person, but that can't change the overall rating of the two machines very much. On the other hand, the information your friend gives you, and the chance to use her iPod, are highly salient. The information is right there in front of you, in your hand, whereas the statistical information from *Consumer Reports* is only in the form of a table that you saw on your computer. The outcome in cases such as this is that people frequently ignore the less salient but more important information, such as the likelihood that events occur across a large population (these statistics are known as *base rates*), in favor of the less important but nevertheless more salient information.

People also vary in the schemas that they find important to use when judging others and when thinking about themselves. Cognitive accessibility refers to*the extent to which knowledge is activated in memory, and thus likely to be used in cognition and behavior*. For instance, you probably know a person who is a golf nut (or fanatic of another sport). All he can talk about is golf. For him, we would say that golf is a highly accessible construct. Because he loves golf, it is important to his self-concept, he sets many of his goals in terms of the sport, and he tends to think about things and people in terms of it ("if he plays golf, he must be a good person!"). Other people have highly accessible schemas about environmental issues, eating healthy food, or drinking really good coffee. When schemas are highly accessible, we are likely to use them to

make judgments of ourselves and others, and this overuse may inappropriately color our judgments.

Counterfactual Thinking

In addition to influencing our judgments about ourselves and others, the ease with which we can retrieve potential experiences from memory can have an important effect on our own emotions. If we can easily imagine an outcome that is better than what actually happened, then we may experience sadness and disappointment; on the other hand, if we can easily imagine that a result might have been worse than what actually happened, we may be more likely to experience happiness and satisfaction. *The tendency to think about and experience events according to "what might have been"* is known ascounterfactual thinking (Kahneman & Miller, 1986; Roese, 2005).[26]

Imagine, for instance, that you were participating in an important contest, and you won the silver (second-place) medal. How would you feel? Certainly you would be happy that you won the silver medal, but wouldn't you also be thinking about what might have happened if you had been just a little bit better—you might have won the gold medal! On the other hand, how might you feel if you won the bronze (third-place) medal? If you were thinking about the *counterfactuals* (the "what might have beens") perhaps the idea of not getting any medal at all would have been highly accessible; you'd be happy that you got the medal that you did get, rather than coming in fourth.

Tom Gilovich and his colleagues (Medvec, Madey, & Gilovich, 1995)[28] investigated this idea by videotaping the responses of athletes who won medals in the 1992 Summer Olympic Games. They videotaped the athletes both as they learned that they had won a silver or a bronze medal and again as they were awarded the medal. Then the researchers showed these videos, without any sound, to raters who did not know which medal which athlete had won. The raters were

asked to indicate how they thought the athlete was feeling, using a range of feelings from "agony" to "ecstasy." The results showed that the bronze medalists were, on average, rated as happier than were the silver medalists. In a follow-up study, raters watched interviews with many of these same athletes as they talked about their performance. The raters indicated what we would expect on the basis of counterfactual thinking—the silver medalists talked about their disappointments in having finished second rather than first, whereas the bronze medalists focused on how happy they were to have finished third rather than fourth.

You might have experienced counterfactual thinking in other situations. Once I was driving across country, and my car was having some engine trouble. I really wanted to make it home when I got near the end of my journey; I would have been extremely disappointed if the car broke down only a few miles from my home. Perhaps you have noticed that once you get close to finishing something, you feel like you really need to get it done. Counterfactual thinking has even been observed in juries. Jurors who were asked to award monetary damages to others who had been in an accident offered them substantially more in compensation if they barely avoided injury than they offered if the accident seemed inevitable (Miller, Turnbull, & McFarland, 1988).[29]

Psychology in Everyday Life: Cognitive Biases in the Real World

Perhaps you are thinking that the kinds of errors that we have been talking about don't seem that important. After all, who really cares if we think there are more words that begin with the letter "R" than there actually are, or if bronze medal winners are happier than the silver medalists? These aren't big problems in the overall scheme of things. But it turns out that what seem to be relatively small cognitive biases on the surface can have profound consequences for people.

Why would so many people continue to purchase lottery tickets, buy risky investments in the stock market, or gamble their money in casinos when the likelihood of them ever winning is so low? One possibility is that they are victims of salience; they focus their attention on the salient likelihood of a big win, forgetting that the base rate of the event occurring is very low. The belief in astrology, which all scientific evidence suggests is not accurate, is probably driven in part by the salience of the occasions when the predictions are correct. When a horoscope comes true (which will, of

[13] Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals, 25*(12), 720–725.

[14] Mazzoni, G. A. L., Loftus, E. F., & Kirsch, I. (2001). Changing beliefs about implausible autobiographical events: A little plausibility goes a long way. *Journal of Experimental Psychology: Applied, 7*(1), 51–59.

[15] Brown, D., Scheflin, A. W., & Hammond, D. C. (1998). *Memory, trauma treatment, and the law*. New York, NY: Norton.

[16] McNally, R. J., Bryant, R. A., & Ehlers, A. (2003). Does early psychological intervention promote recovery from posttraumatic stress? *Psychological Science in the Public Interest, 4*(2), 45–79; Pope, H. G., Jr., Poliakoff, M. B., Parker, M. P., Boynes, M., & Hudson, J. I. (2007). Is dissociative amnesia a culture-bound syndrome? Findings from a survey of historical literature. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences, 37*(2), 225–233.

[17] Loftus, E. F., & Ketcham, K. (1994). *The myth of repressed memory: False memories and allegations of sexual abuse* (1st ed.). New York, NY: St. Martin's Press.

[18] Dunning, D., Griffin, D. W., Milojkovic, J. D., & Ross, L. (1990). The overconfidence effect in social prediction. *Journal of Personality and Social Psychology, 58*(4), 568–581.

[19] Wells, G. L., & Olson, E. A. (2003). Eyewitness testimony. *Annual Review of Psychology, 54*, 277–295.

[20] Brown, R., & Kulik, J. (1977). Flashbulb memories. *Cognition, 5*, 73–99.

[21] Talarico, J. M., & Rubin, D. C. (2003). Confidence, not consistency, characterizes flashbulb memories. *Psychological Science, 14*(5), 455–461.

[22] Schmolck, H., Buffalo, E. A., & Squire, L. R. (2000). Memory distortions develop over time: Recollections of the O. J. Simpson trial verdict after 15 and 32 months. *Psychological Science, 11*(1), 39–45.

[23] MacLeod, C., & Campbell, L. (1992). Memory accessibility and probability judgments: An experimental evaluation of the availability heuristic. *Journal of Personality and Social Psychology, 63*(6), 890–902; Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5*, 207–232.

[24] McArthur, L. Z., & Post, D. L. (1977). Figural emphasis and person perception. *Journal of Experimental Social Psychology, 13*(6), 520–535; Taylor, S. E., & Fiske, S. T. (1978). Salience, attention and attribution: Top of the head phenomena. *Advances in Experimental Social Psychology, 11*, 249–288.

[25] Loftus, E. F., Loftus, G. R., & Messo, J. (1987). Some facts about "weapon focus." *Law and Human Behavior, 11*(1), 55–62.

[26] Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review, 93*, 136–153; Roese, N. (2005). *If only: How to turn regret into opportunity*. New York, NY: Broadway Books.

Psychologists have long debated how to best conceptualize and measure intelligence (Sternberg, 2003).[1] These questions include how many types of intelligence there are, the role of nature versus nurture in intelligence, how intelligence is represented in the brain, and the meaning of group differences in intelligence.

General (g) Versus Specific (s) Intelligences

In the early 1900s, the French psychologist Alfred Binet (1857–1914) and his colleague Henri Simon (1872–1961) began working in Paris to develop a measure that would differentiate students who were expected to be better learners from students who were expected to be slower learners. The goal was to help teachers better educate these two groups of students. Binet and Simon developed what most psychologists today regard as the first intelligence test, which consisted of a wide variety of questions that included the ability to name objects, define words, draw pictures, complete sentences, compare items, and construct sentences.

Binet and Simon (Binet, Simon, & Town, 1915; Siegler, 1992)[2] believed that the questions they asked their students, even though they were on the surface dissimilar, all assessed the basic abilities to understand, reason, and make judgments. And it turned out that the correlations among these different types of measures were in fact all positive; students who got one item correct were more likely to also get other items correct, even though the questions themselves were very different.

On the basis of these results, the psychologist Charles Spearman (1863–1945) hypothesized that there must be a single underlying construct that all of these items measure. He called *the construct that the different abilities and skills measured on intelligence tests have in common* thegeneral intelligence factor (g). Virtually all psychologists now believe that there is a generalized intelligence factor, g, that relates to abstract thinking and that includes the abilities to acquire knowledge, to reason abstractly, to adapt to novel situations, and to benefit from

instruction and experience (Gottfredson, 1997; Sternberg, 2003).[3] People with higher general intelligence learn faster.

Soon after Binet and Simon introduced their test, the American psychologist Lewis Terman (1877–1956) developed an American version of Binet's test that became known as the *Stanford-Binet Intelligence Test*. The Stanford-Binet is a measure of general intelligence made up of a wide variety of tasks including vocabulary, memory for pictures, naming of familiar objects, repeating sentences, and following commands.

Although there is general agreement among psychologists that g exists, there is also evidence for specific intelligence (s), *a measure of specific skills in narrow domains*. One empirical result in support of the idea of s comes from intelligence tests themselves. Although the different types of questions do correlate with each other, some items correlate more highly with each other than do other items; they form clusters or clumps of intelligences.

One distinction is between *fluid intelligence*, which refers to the capacity to learn new ways of solving problems and performing activities, and *crystallized intelligence*, which refers to the accumulated knowledge of the world we have acquired throughout our lives (Salthouse, 2004).[4] These intelligences must be different because crystallized intelligence increases with age—older adults are as good as or better than young people in solving crossword puzzles—whereas fluid intelligence tends to decrease with age (Horn, Donaldson, & Engstrom, 1981; Salthouse, 2004).[5]

Other researchers have proposed even more types of intelligences. L. L. Thurstone (1938)[6] proposed that there were seven clusters of *primary mental abilities*, made up of word fluency, verbal comprehension, spatial ability, perceptual speed, numerical ability, inductive reasoning, and memory. But even these dimensions tend to be at least somewhat correlated, showing again the importance of g.

One advocate of the idea of multiple intelligences is the psychologist Robert Sternberg. Sternberg has proposed a triarchic (three-part) theory of intelligence that proposes that *people*

Extremes of Intelligence: Retardation and Giftedness

The results of studies assessing the measurement of intelligence show that IQ is distributed in the population in the form of anormal distribution (or bell curve), which is *the pattern of scores usually observed in a variable that clusters around its average*. In a normal distribution, the bulk of the scores fall toward the middle, with many fewer scores falling at the extremes. The normal distribution of intelligence (Figure 9.6 "Distribution of IQ Scores in the General Population") shows that on IQ tests, as well as on most other measures, the majority of people cluster around the average (in this case, where IQ = 100), and fewer are either very smart or very dull. Because the standard deviation of an IQ test is about 15, this means that about 2% of people score above an IQ of 130 (often considered the threshold for *giftedness*), and about the same percentage score below an IQ of 70 (often being considered the threshold for *mental retardation*).

Although Figure 9.6 "Distribution of IQ Scores in the General Population" presents a single distribution, the actual IQ distribution varies by sex such that the distribution for men is more spread out than is the distribution for women. These sex differences mean that about 20% more men than women fall in the extreme (very smart or very dull) ends of the distribution (Johnson, Carothers, & Deary, 2008).[2] Boys are about five times more likely to be diagnosed with the reading disability dyslexia than are girls (Halpern, 1992),[3] and are also more likely to be classified as mentally retarded. But boys are also about 20% more highly represented in the upper end of the IQ distribution.

profound mental retardation is usually caused by genetic mutations or accidents during birth, whereas mild forms have both genetic and environmental influences.

One cause of mental retardation is Down syndrome, *a chromosomal disorder leading to mental retardation caused by the presence of all or part of an extra 21st chromosome*. The incidence of Down syndrome is estimated at 1 per 800 to 1,000 births, although its prevalence rises sharply in those born to older mothers. People with Down syndrome typically exhibit a distinctive pattern of physical features, including a flat nose, upwardly slanted eyes, a protruding tongue, and a short neck.

Societal attitudes toward individuals with mental retardation have changed over the past decades. We no longer use terms such as "moron," "idiot," or "imbecile" to describe these people, although these were the official psychological terms used to describe degrees of retardation in the past. Laws such as the Americans with Disabilities Act (ADA) have made it illegal to discriminate on the basis of mental and physical disability, and there has been a trend to bring the mentally retarded out of institutions and into our workplaces and schools. In 2002 the U.S. Supreme Court ruled that the execution of people with mental retardation is "cruel and unusual punishment," thereby ending this practice (Atkins v. Virginia, 2002).[6]

Extremely High Intelligence

Having extremely high IQ is clearly less of a problem than having extremely low IQ, but there may also be challenges to being particularly smart. It is often assumed that schoolchildren who are labeled as "gifted" may have adjustment problems that make it more difficult for them to create social relationships. To study gifted children, Lewis Terman and his colleagues (Terman & Oden, 1959)[7] selected about 1,500 high school students who scored in the top 1% on the Stanford-Binet and similar IQ tests (i.e., who had IQs of about 135 or higher), and tracked them for more than seven decades (the children became known as the "termites" and are still being studied today). This study found, first, that these students were not unhealthy or poorly adjusted but rather were above average in physical health and were taller and heavier than individuals in

abandoned between the 1940s and the 1960s, although sterilization laws remained on the books in some states until the 1970s.

One explanation for race differences in IQ is that intelligence tests are biased against some groups and in favor of others. By bias, what psychologists mean is that a test predicts outcomes—such as grades or occupational success—better for one group than it does for another. If IQ is a better predictor of school grade point average for Whites than it is for Asian Americans, for instance, then the test would be biased against Asian Americans, even though the average IQ scores for Asians might be higher. But IQ tests do not seem to be racially biased because the observed correlations between IQ tests and both academic and occupational achievement are about equal across races (Brody, 1992).[24]

Another way that tests might be biased is if questions are framed such that they are easier for people from one culture to understand than for people from other cultures. For example, even a very smart person will not do well on a test if he or she is not fluent in the language in which the test is administered, or does not understand the meaning of the questions being asked. But modern intelligence tests are designed to be culturally neutral, and group differences are found even on tests that ask about spatial intelligence. Although some researchers still are concerned about the possibility that intelligence tests are culturally biased, it is probably not the case that the tests are creating all of the observed group differences (Suzuki & Valencia, 1997).[25]

Research Focus: Stereotype Threat

Although intelligence tests may not be culturally biased, the situation in which one takes a test may be. One environmental factor that may affect how individuals perform and achieve is their expectations about their ability at a task. In some cases these beliefs may be positive, and they have the effect of making us feel more confident and thus better able to perform tasks. For instance, research has found that because Asian students are aware of the cultural stereotype that "Asians are good at math," reminding them of this fact before they take a difficult math test can improve their performance on the test (Walton & Cohen, 2003).[26] On the other hand, sometimes these beliefs are

Intelligence and culture. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology* (pp. 547–568). New York, NY: Guilford Press.

[2] Johnson, W., Carothers, A., & Deary, I. J. (2009). A role for the X chromosome in sex differences in variability in general intelligence? *Perspectives on Psychological Science, 4*(6), 598–611.

[3] Halpern, D. F. (1992). *Sex differences in cognitive abilities* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

[4] Switzky, H. N., & Greenspan, S. (2006). *What is mental retardation? Ideas for an evolving disability in the 21st century*. Washington, DC: American Association on Mental Retardation.

[5] Greenspan, S., Loughlin, G., & Black, R. S. (2001). Credulity and gullibility in people with developmental disorders: A framework for future research. In L. M. Glidden (Ed.),*International review of research in mental retardation* (Vol. 24, pp. 101–135). San Diego, CA: Academic Press.

[6] Atkins v. Virginia, 536 U.S. 304 (2002).

[7] Terman, L. M., & Oden, M. H. (1959). *Genetic studies of genius: The gifted group at mid-life* (Vol. 5). Stanford, CA: Stanford University Press.

[8] Seagoe, M. V. (1975). *Terman and the gifted*. Los Altos, CA: William Kaufmann.

[9] Lubinski, D., & Benbow, C. P. (2006). Study of mathematically precocious youth after 35 years: Uncovering antecedents for the development of math-science expertise. *Perspectives on Psychological Science, 1*(4), 316–345.

[10] Colangelo, N., & Assouline, S. G. (2009). Acceleration: Meeting the academic and social needs of students. In T. Balchin, B. Hymer, & D. J. Matthews (Eds.), *The Routledge international companion to gifted education* (pp. 194–202). New York, NY: Routledge.

[11] Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist, 60*(6), 581–592.

[12] Halpern, D. F., Benbow, C. P., Geary, D. C., Gur, R. C., Hyde, J. S., & Gernsbache, M. A. (2007). The science of sex differences in science and mathematics. *Psychological Science in the Public Interest, 8*(1), 1–51.

[13] McClure, E. B. (2000). A meta-analytic review of sex differences in facial expression processing and their development in infants, children, and adolescents. *Psychological Bulletin, 126*(3), 424–453.

[14] Voyer, D., Voyer, S., & Bryden, M. P. (1995). Magnitude of sex differences in spatial abilities: A meta-analysis and consideration of critical variables. *Psychological Bulletin, 117*(2), 250–270.

[15] Vogel, G. (1996). School achievement: Asia and Europe top in world, but reasons are hard to find. *Science, 274*(5291), 1296.

Examples in Which Syntax Is Correct but the Interpretation Can Be Ambiguous

- Grandmother of Eight Makes Hole in One
- Milk Drinkers Turn to Powder
- Farmer Bill Dies in House
- Old School Pillars Are Replaced by Alumni
- Two Convicts Evade Noose, Jury Hung
- Include Your Children When Baking Cookies

The Biology and Development of Language

Anyone who has tried to master a second language as an adult knows the difficulty of language learning. And yet children learn languages easily and naturally. Children who are not exposed to language early in their lives will likely never learn one. Case studies, including Victor the "Wild Child," who was abandoned as a baby in France and not discovered until he was 12, and Genie, a child whose parents kept her locked in a closet from 18 months until 13 years of age, are (fortunately) two of the only known examples of these deprived children. Both of these children made some progress in socialization after they were rescued, but neither of them ever developed language (Rymer, 1993). [2] This is also why it is important to determine quickly if a child is deaf and to begin immediately to communicate in sign language. Deaf children who are not exposed to sign language during their early years will likely never learn it (Mayberry, Lock, & Kazmi, 2002). [3]

Research Focus: When Can We Best Learn Language? Testing the Critical Period Hypothesis

For many years psychologists assumed that there was a critical period (*a time in which learning can easily occur*) for language learning, lasting between infancy and puberty, and after which language learning was more difficult or impossible (Lenneberg, 1967; Penfield & Roberts, 1959). [4] But more recent research has provided a different interpretation.

An important study by Jacqueline Johnson and Elissa Newport (1989) [5] using Chinese and Korean speakers who had learned English as a second language provided the first insight. The participants were all adults who had immigrated

learning a second language produces changes in the area of the brain in the left hemisphere that is involved in language, such that this area is denser and contains more neurons (Mechelli et al., 2004).[26] Furthermore, the increased density is stronger in those individuals who are most proficient in their second language and who learned the second language earlier. Thus, rather than slowing language development, learning a second language seems to increase cognitive abilities.

Figure 9.15 *Gray Matter in Bilinguals*

unless they have a profound brain abnormality or are completely isolated from other humans, learn language.

Language and Perception

To this point in the chapter we have considered intelligence and language as if they are separate concepts. But what if language influences our thinking? *The idea that language and its structures influence and limit human thought* is called linguistic relativity.

The most frequently cited example of this possibility was proposed by Benjamin Whorf (1897–1941), an American linguist who was particularly interested in Native American languages. Whorf argued that the Inuit people of Canada (sometimes known as Eskimos) had many words for snow, whereas English speakers have only one, and that this difference influenced how the different cultures perceived snow. Whorf argued that the Inuit perceived and categorized snow in finer details than English speakers possibly could, because the English language constrained perception.

Although the idea of linguistic relativism seemed reasonable, research has suggested that language has less influence on thinking than might be expected. For one, in terms of perceptions of snow, although it is true that the Inuit do make more distinctions among types of snow than do English speakers, the latter also make some distinctions (think "powder," "slush," "whiteout," and so forth). And it is also possible that thinking about snow may influence language, rather than the other way around.

In a more direct test of the possibility that language influences thinking, Eleanor Rosch (1973)[34] compared people from the Dani culture of New Guinea, who have only two terms for color ("dark" and "bright"), with English speakers who use many more terms. Rosch hypothesized that if language constrains perception and categorization, then the Dani should have a harder time distinguishing colors than would English speakers. But her research found that when the Dani were asked to categorize colors using new categories, they did so in almost

- Noam Chomsky argues that human brains contain a language acquisition module that includes a universal grammar that underlies all human language. Chomsky differentiates between the deep structure and the surface structure of an idea.
- Although other animals communicate and may be able to express ideas, only the human brain is complex enough to create real language.
- Our language may have some influence on our thinking, but it does not affect our underlying understanding of concepts.

EXERCISES AND CRITICAL THINKING

1. What languages do you speak? Did you ever try to learn a new one? What problems did you have when you did this? Would you consider trying to learn a new language?
2. Some animals, such as Kanzi, display at least some language. Do you think that this means that they are intelligent?

[1] Werker, J. F., & Tees, R. C. (2002). Cross-language speech perception: Evidence for perceptual reorganization during the first year of life. *Infant Behavior & Development, 25*(1), 121–133.

[2] Rymer, R. (1993). *Genie: An abused child's flight from silence*. New York, NY: HarperCollins.

[3] Mayberry, R. I., Lock, E., & Kazmi, H. (2002). Development: Linguistic ability and early language exposure. *Nature, 417*(6884), 38.

[4] Lenneberg, E. (1967). *Biological foundations of language*. New York, NY: John Wiley & Sons; Penfield, W., & Roberts, L. (1959). *Speech and brain mechanisms*. Princeton, NJ: Princeton University Press.

[5] Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology, 21*(1), 60–99.

[6] Hakuta, K., Bialystok, E., & Wiley, E. (2003). Critical evidence: A test of the critical-period hypothesis for second-language acquisition. *Psychological Science, 14*(1), 31–38.

[7] Moon, C., Cooper, R. P., & Fifer, W. P. (1993). Two-day-olds prefer their native language. *Infant Behavior & Development, 16*(4), 495–500.

Chapter 10
Emotions and Motivations

Captain Sullenberger Conquers His Emotions

He was 3,000 feet up in the air when the sudden loss of power in his airplane put his life, as well as the lives of 150 other passengers and crew members, in his hands. Both of the engines on flight 1539 had shut down, and his options for a safe landing were limited.

Sully kept flying the plane and alerted the control tower to the situation:

> *This is Cactus 1539…hit birds. We lost thrust in both engines. We're turning back towards La Guardia.*

When the tower gave him the compass setting and runway for a possible landing, Sullenberger's extensive experience allowed him to give a calm response:

> *I'm not sure if we can make any runway…Anything in New Jersey?*

Captain Sullenberger was not just any pilot in a crisis, but a former U.S. Air Force fighter pilot with 40 years of flight experience. He had served as a flight instructor and the Airline Pilots Association safety chairman. Training had quickened his mental processes in assessing the threat, allowing him to maintain what tower operators later called an "eerie calm." He knew the capabilities of his plane.

When the tower suggested a runway in New Jersey, Sullenberger calmly replied:

> *We'[illegible] We may end up in the Hudson.*

The last communication from Captain Sullenberger to the tower advised of the eventual outcome:

> *We're going to be in the Hudson.*

He calmly set the plane down on the water. Passengers reported that the landing was like landing on a rough runway. The crew kept the passengers calm as women, children, and then the rest of the passengers were evacuated onto the boats of the rescue personnel that had quickly arrived. Captain Sullenberger then calmly walked the aisle of the plane to be sure that everyone was out before joining the 150 other rescued survivors (Levin, 2009; National Transportation Safety Board, 2009).[1]

Some called it "grace under pressure," and others the "miracle on the Hudson." But psychologists see it as the ultimate in *emotion regulation*—the ability to control and productively use one's emotions.

10.1 The Experience of Emotion

LEARNING OBJECTIVES

1. Explain the biological experience of emotion.
2. Summarize the psychological theories of emotion.
3. Give examples of the ways that emotion is communicated.

The most fundamental emotions, known as the basic emotions, are those of*anger, disgust, fear, happiness, sadness, and surprise*. The basic emotions have a long history in human evolution, and they have developed in large part to help us make rapid judgments about stimuli and to quickly guide appropriate behavior (LeDoux, 2000). [1] The basic emotions are determined in large part by one of the oldest parts of our brain, the limbic system, including the amygdala, the hypothalamus, and the thalamus. Because they are primarily evolutionarily determined, the basic emotions are experienced and displayed in much the same way across cultures (Ekman, 1992; Elfenbein & Ambady, 2002, 2003; Fridland, Ekman, & Oster, 1987), [2] and people are quite accurate at judging the facial expressions of people from different cultures. View Note 10.8 "Video Clip: The Basic Emotions" to see a demonstration of the basic emotions.

Video Clip: The Basic Emotions

Not all of our emotions come from the old parts of our brain; we also interpret our experiences to create a more complex array of emotional experiences. For instance, the amygdala may sense fear when it senses that the body is falling, but that fear may be interpreted completely differently (perhaps even as “excitement”) when we are falling on a roller-coaster ride than when we are falling from the sky in an airplane that has lost power. The *cognitive interpretations that accompany emotions*—known as cognitive appraisal—allow us to experience a much larger and more complex set of *secondary emotions*, as shown in Figure 10.2 "The Secondary Emotions". Although they are in large part cognitive, our experiences of the secondary emotions are determined in part by arousal (on the vertical axis of Figure 10.2 "The Secondary Emotions")

- According to the two-factor theory of emotion, the experience of emotion is determined by the intensity of the arousal we are experiencing, and the cognitive appraisal of the situation determines what the emotion will be.
- When people incorrectly label the source of the arousal that they are experiencing, we say that they have misattributed their arousal.
- We express our emotions to others through nonverbal behaviors, and we learn about the emotions of others by observing them.

EXERCISES AND CRITICAL THINKING

1. Consider the three theories of emotion that we have discussed and provide an example of a situation in which a person might experience each of the three proposed patterns of arousal and emotion.
2. Describe a time when you used nonverbal behaviors to express your emotions or to detect the emotions of others. What specific nonverbal techniques did you use to communicate?

[1] LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience, 23*, 155–184.

[2] Ekman, P. (1992). Are there basic emotions? *Psychological Review, 99*(3), 550–553; Elfenbein, H. A., & Ambady, N. (2002). On the universality and cultural specificity of emotion recognition: A meta-analysis. *Psychological Bulletin, 128*, 203–23; Fridlund, A. J., Ekman, P., & Oster, H. (1987). Facial expressions of emotion. In A. Siegman & S. Feldstein (Eds.), *Nonverbal behavior and communication* (2nd ed., pp. 143–223). Hillsdale, NJ: Lawrence Erlbaum Associates.

[3] Martin, L. L. & Tesser, A. (2006). Extending the goal progress theory of rumination: Goal reevaluation and growth. In L. J. Sanna & E. C. Chang (Eds.), *Judgments over time: The interplay of thoughts, feelings, and behaviors* (pp. 145–162). New York, NY: Oxford University Press.

[4] Damasio, A. (2000). *The feeling of what happens: Body and emotion in the making of consciousness*. New York, NY: Mariner Books; LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience, 23*, 155–184; Ochsner, K. N., Bunge, S. A., Gross, J. J., & Gabrieli, J. D. E. (2002). Rethinking feelings: An fMRI study of the cognitive regulation of emotion. *Journal of Cognitive Neuroscience, 14*(8), 1215–1229.

[5] Damasio, A. R. (1994). *Descartes' error: Emotion, reason, and the human brain*. New York, NY: Grosset/Putnam; Dijksterhuis, A., Bos, M. W., Nordgren, L. F., & van Baaren, R. B. (2006). On making the right choice: The deliberation-without-attention effect. *Science, 311*(5763), 1005–1007; Nordgren, L. F., & Dijksterhuis, A. P. (2009). The devil is in the deliberation: Thinking too much reduces preference consistency. *Journal of Consumer Research, 36*(1), 39–46; Wilson, T. D., & Schooler, J. W. (1991).

Thinking too much: Introspection can reduce the quality of preferences and decisions. *Journal of Personality and Social Psychology, 60*(2), 181–192.

[6] James, W. (1884). What is an emotion? *Mind, 9*(34), 188–205.

[7] LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience, 23,*155–184.

[8] Hohmann, G. W. (1966). Some effects of spinal cord lesions on experienced emotional feelings. *Psychophysiology, 3*(2), 143–156.

[9] Whalen, P. J., Shin, L. M., McInerney, S. C., Fischer, H., Wright, C. I., & Rauch, S. L. (2001). A functional MRI study of human amygdala responses to facial expressions of fear versus anger. *Emotion, 1*(1), 70–83; Witvliet, C. V., & Vrana, S. R. (1995). Psychophysiological responses as indices of affective dimensions. *Psychophysiology, 32*(5), 436–443.

[10] Leary, M. R., Britt, T. W., Cutlip, W. D., & Templeton, J. L. (1992). Social blushing.*Psychological Bulletin, 112*(3), 446–460.

[11] Oatley, K., Keltner, D., & Jenkins, J. M. (2006). *Understanding emotions* (2nd ed.). Malden, MA: Blackwell.

[12] Schachter, S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review, 69*, 379–399.

[13] Dutton, D., & Aron, A. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology, 30*, 510–517.

[14] Schachter, S., & Singer, J. E. (1962). Cognitive, social and physiological determinants of emotional state. *Psychological Review, 69*, 379–399.

[15] Schachter, S., & Singer, J. E. (1962). Cognitive, social and physiological determinants of emotional state. *Psychological Review, 69*, 379–399.

[16] Ambady, N., & Weisbuch, M. (2010). Nonverbal behavior. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed., Vol. 1, pp. 464–497). Hoboken, NJ: John Wiley & Sons; Andersen, P. (2007). *Nonverbal communication: Forms and functions*(2nd ed.). Long Grove, IL: Waveland Press.

[17] Strack, F., Martin, L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology, 54*(5), 768–777. doi:10.1037/0022-3514.54.5.768

[18] Stepper, S., & Strack, F. (1993). Proprioceptive determinants of emotional and nonemotional feelings. *Journal of Personality and Social Psychology, 64*(2), 211–220.

1936, 1974, 1982).[4] Seyle found that regardless of the source of the stress, the rats experienced the same series of physiological changes as they suffered the prolonged stress. Seyle created the termgeneral adaptation syndrome to refer to *the three distinct phases of physiological change that occur in response to long-term stress: alarm, resistance, and exhaustion* (Figure 10.8 "General Adaptation Syndrome").

Figure 10.8 *General Adaptation Syndrome*

[5] Rodrigues, S. M., LeDoux, J. E., & Sapolsky, R. M. (2009). The influence of stress hormones on fear circuitry. *Annual Review of Neuroscience, 32*, 289–313.

[6] Cohen, S., & Herbert, T. B. (1996). Health psychology: Psychological factors and physical disease from the perspective of human psychoneuroimmunology. *Annual Review of Psychology, 47*, 113–142; Faulkner, S., & Smith, A. (2009). A prospective diary study of the role of psychological stress and negative mood in the recurrence of herpes simplex virus (HSV1). *Stress and Health: Journal of the International Society for the Investigation of Stress, 25*(2), 179–187; Miller, G., Chen, E., & Cole, S. W. (2009). Health psychology: Developing biologically plausible models linking the social world and physical health.*Annual Review of Psychology, 60*, 501–524; Uchino, B. N., Smith, T. W., Holt-Lunstad, J., Campo, R., & Reblin, M. (2007). Stress and illness. In J. T. Cacioppo, L. G. Tassinary, & G. G. Berntson (Eds.), *Handbook of psychophysiology* (3rd ed., pp. 608–632). New York, NY: Cambridge University Press.

[7] Epel, E., Lin, J., Wilhelm, F., Wolkowitz, O., Cawthon, R., Adler, N.,…Blackburn, E. H. (2006). Cell aging in relation to stress arousal and cardiovascular disease risk factors.*Psychoneuroendocrinology, 31*(3), 277–287.

[8] Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Psychoneuroimmunology: Psychological influences on immune function and health.*Journal of Consulting & Clinical Psychology, 70*(3), 537–547; Wells, W. (2006). How chronic stress exacerbates cancer. *Journal of Cell Biology, 173*(4), 477.

[9] Krantz, D. S., & McCeney, M. K. (2002). Effects of psychological and social factors on organic disease: A critical assessment of research on coronary heart disease. *Annual Review of Psychology, 53*, 341–369.

[10] Dekker, M., Koper, J., van Aken, M., Pols, H., Hofman, A., de Jong, F.,…Tiemeier, H. (2008). Salivary cortisol is related to atherosclerosis of carotid arteries. *Journal of Clinical Endocrinology & Metabolism, 93*(10), 3741.

[11] Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research, 11*, 213–218.

[12] Rahe, R. H., Mahan, J., Arthur, R. J., & Gunderson, E. K. E. (1970). The epidemiology of illness in naval environments: I. Illness types, distribution, severities and relationships to life change. *Military Medicine, 135*, 443–452.

[13] Hutchinson, J. G., & Williams, P. G. (2007). Neuroticism, daily hassles, and depressive symptoms: An examination of moderating and mediating effects. *Personality and Individual Differences, 42*(7), 1367–1378.

[14] Fiksenbaum, L. M., Greenglass, E. R., & Eaton, J. (2006). Perceived social support, hassles, and coping among the elderly. *Journal of Applied Gerontology, 25*(1), 17–30.

[15] Glaser, R. (1985). Stress-related impairments in cellular immunity. *Psychiatry Research, 16*(3), 233–239.

One difficulty that people face when trying to improve their happiness is that they may not always know what will make them happy. As one example, many of us think that if we just had more money we would be happier. While it is true that we do need money to afford food and adequate shelter for ourselves and our families, after this minimum level of wealth is reached, more money does not generally buy more happiness (Easterlin, 2005).[25] For instance, as you can see in , even though income and material success has improved dramatically in many countries over the past decades, happiness has not. Despite tremendous economic growth in France, Japan, and the United States between 1946 to 1990, there was no increase in reports of well-being by the citizens of these countries. Americans today have about three times the buying power they had in the 1950s, and yet overall happiness has not increased. The problem seems to be that we never seem to have enough money to make us "really" happy. Csikszentmihalyi (1999)[26] reported that people who earned $30,000 per year felt that they would be happier if they made $50,000 per year, but that people who earned $100,000 per year said that they would need $250,000 per year to make them happy.

Figure 10.11 *Income and Happiness*

If pleasure is fleeting, at least misery shares some of the same quality. We might think we can't be happy if something terrible, such as the loss of a partner or child, were to happen to us, but after a period of adjustment most people find that happiness levels return to prior levels (Bonnano et al., 2002).[32] Health concerns tend to put a damper on our feeling of well-being, and those with a serious disability or illness show slightly lowered mood levels. But even when health is compromised, levels of misery are lower than most people expect (Lucas, 2007; Riis et al., 2005).[33] For instance, although disabled individuals have more concern about health, safety, and acceptance in the community, they still experience overall positive happiness levels (Marinić & Brkljačić, 2008).[34] Taken together, it has been estimated that our wealth, health, and life circumstances account for only 15% to 20% of life satisfaction scores (Argyle, 1999).[35] Clearly the main ingredient in happiness lies beyond, or perhaps beneath, external factors.

KEY TAKEAWAYS

- Positive thinking can be beneficial to our health.
- Optimism, self-efficacy, and hardiness all relate to positive health outcomes.
- Happiness is determined in part by genetic factors, but also by the experience of social support.
- People may not always know what will make them happy.
- Material wealth plays only a small role in determining happiness.

EXERCISES AND CRITICAL THINKING

1. Are you a happy person? Can you think of ways to increase your positive emotions?
2. Do you know what will make you happy? Do you believe that material wealth is not as important as you might have thought it would be?

[1] Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction.*American Psychologist, 55*(1), 5–14.

[2] Carver, C. S., & Scheier, M. F. (2009). Optimism. In M. R. Leary & R. H. Hoyle (Eds.),*Handbook of individual differences in social behavior* (pp. 330–342). New York, NY: Guilford Press.

[3] Thompson, S. C. (2009). The role of personal control in adaptive functioning. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology* (2nd ed., pp. 271–278). New York, NY: Oxford University Press.

[4] Rodin, J. (1986). Aging and health: Effects of the sense of control. *Science, 233*(4770), 1271–1276.

[5] Glass, D. C., Reim, B., & Singer, J. E. (1971). Behavioral consequences of adaptation to controllable and uncontrollable noise. *Journal of Experimental Social Psychology, 7*(2), 244–257.

[6] Sapolsky, R. M. (2005). The influence of social hierarchy on primate health. *Science, 308*(5722), 648–652.

[7] Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology, 42*(1), 168–177.

[8] Carver, C. S., Smith, R. G., Antoni, M. H., Petronis, V. M., Weiss, S., & Derhagopian, R. P. (2005). Optimistic personality and psychosocial well-being during treatment predict psychosocial well-being among long-term survivors of breast cancer. *Health Psychology, 24*(5), 508–516.

[9] Cohen, S., & Pressman, S. D. (2006). Positive affect and health. *Current Directions in Psychological Science, 15*(3), 122–125.

[10] Dolbier, C. L., Smith, S. E., & Steinhardt, M. A. (2007). Relationships of protective factors to stress and symptoms of illness. *American Journal of Health Behavior, 31*(4), 423–433.

[11] Baker, S. R. (2007). Dispositional optimism and health status, symptoms, and behaviors: Assessing ideothetic relationships using a prospective daily diary approach.*Psychology and Health, 22*(4), 387–455.

[12] Antoni, M. H., Lehman, J. M., Kilbourn, K. M., Boyers, A. E., Culver, J. L., Alferi, S. M., ... Kilbourn, K. (2001). Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychology, 20*(1), 20–32.

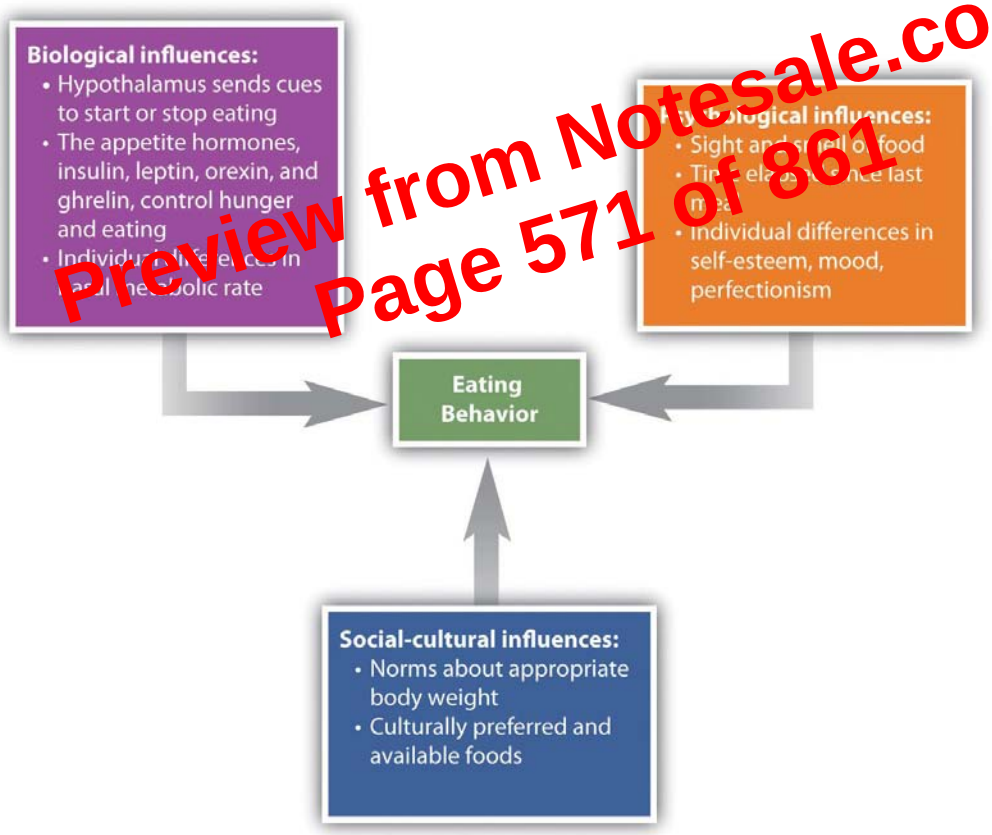
[13] Maddi, S. R., Kahn, S., & Maddi, K. L. (1998). The effectiveness of hardiness training.*Consulting Psychology Journal: Practice and Research, 50*(2), 78–86.

[14] Peterson, C., Seligman, M. E. P., Yurko, K. H., Martin, L. R., & Friedman, H. S. (1998). Catastrophizing and untimely death. *Psychological Science, 9*(2), 127–130.

[15] Levy, B., & Myers, L. (2005). Relationship between respiratory mortality and self-perceptions of aging. *Psychology & Health, 20*(5), 553–564. doi:10.1080/14768320500066381; Levy, B., Slade, M., & Kasl, S. (2002). Longitudinal benefit of positive self-perceptions of aging on functional health. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 57B*(5), P409. Retrieved from Academic Search Premier Database.

[16] Diener, E., Nickerson, C., Lucas, R., & Sandvik, E. (2002). Dispositional affect and job outcomes. *Social Indicators Research, 59*(3), 229. Retrieved from Academic Search Premier Database.

Figure 10.12 *Biological, Psychological, and Social-Cultural Contributors to Eating*



kg/m^2 and as obese when it is greater than 30 kg/m^2. If you know your height and weight, you can go to http://www.nhlbisupport.com/bmi to calculate your BMI.

Obesity is a leading cause of death worldwide. Its prevalence is rapidly increasing, and it is one of the most serious public health problems of the 21st century. Although obesity is caused in part by genetics, it is increased by overeating and a lack of physical activity (Nestle & Jacobson, 2000; James, 2008).[16]

There are really only two approaches to controlling weight: eat less and exercise more. Dieting is difficult for anyone, but it is particularly difficult for people with slow basal metabolic rates, who must cope with severe hunger to lose weight. Although most weight loss can be maintained for about a year, very few people are able to maintain substantial weight loss through dieting alone for more than three years (Miller, 1999).[17] Substantial weight loss of more than 50 pounds is typically seen only when weight loss surgery has been performed (Douketis, Macie, Thabane, & Williamson, 2005).[18] Weight loss surgery reduces stomach volume or bowel length, leading to earlier satiation and reduced ability to absorb nutrients from food.

Although dieting alone does not produce a great deal of weight loss over time, its effects are substantially improved when it is accompanied by more physical activity. People who exercise regularly, and particularly those who combine exercise with dieting, are less likely to be obese (Borer, 2008).[19] Exercise not only improves our waistline but also makes us healthier overall. Exercise increases cardiovascular capacity, lowers blood pressure, and helps improve diabetes, joint flexibility, and muscle strength (American Heart Association, 1998).[20] Exercise also slows the cognitive impairments that are associated with aging (Kramer, Erickson, & Colcombe, 2006).[21]

Because the costs of exercise are immediate but the benefits are long-term, it may be difficult for people who do not exercise to get started. It is important to make a regular schedule, to work exercise into one‘s daily activities, and to view exercise not as a cost but as an opportunity to

Orgasm. Muscular contractions occur throughout the body, but particularly in the genitals. The spasmodic ejaculations of sperm are similar to the spasmodic contractions of vaginal walls, and the experience of orgasm is similar for men and women. The woman‘s orgasm helps position the uterus to draw sperm inward (Thornhill & Gangestad, 1995).[27]

Resolution. After orgasm the body gradually returns to its prearoused state. After one orgasm, men typically experience a *refractory period*, in which they are incapable of reaching another orgasm for several minutes, hours, or even longer. Women may achieve several orgasms before entering the resolution stage.

The sexual response cycle and sexual desire are regulated by the sex hormones*estrogen* in women and *testosterone* in both women and in men. Although the hormones are secreted by the ovaries and testes, it is the hypothalamus and the pituitary glands that control the process. Estrogen levels in women vary across the menstrual cycle, peaking during ovulation (Pillsworth, Haselton, & Buss, 2004).[28] Women are more interested in having sex during ovulation but can experience high levels of sexual arousal throughout the menstrual cycle.

In men, testosterone is essential to maintain sexual desire and to sustain an erection, and testosterone injections can increase sexual interest and performance (Aversa et al., 2000; Jockenhövel et al., 2009).[29] Testosterone is also important in the female sex cycle. Women who are experiencing menopause may develop a loss of interest in sex, but this interest may be rekindled through estrogen and testosterone replacement treatments (Meston & Frohlich, 2000).[30]

Although their biological determinants and experiences of sex are similar, men and women differ substantially in their overall interest in sex, the frequency of their sexual activities, and the mates they are most interested in. Men show a more consistent interest in sex, whereas the sexual desires of women are more likely to vary over time (Baumeister, 2000).[31] Men fantasize about sex more often than women, and their fantasies are more physical and less intimate (Leitenberg

Psychology in Everyday Life: Regulating Emotions to Improve Our Health

Although smoking cigarettes, drinking alcohol, using recreational drugs, engaging in unsafe sex, and eating too much may produce enjoyable positive emotions in the short term, they are some of the leading causes of negative health outcomes and even death in the long term (Mokdad, Marks, Stroup, & Gerberding, 2004).[45] To avoid these negative outcomes, we must use our cognitive resources to plan, guide, and restrain our behaviors. And we (like Captain Sullenberger) can also use our emotion regulation skills to help us do better.

Even in an age where the addictive and detrimental health effects of cigarette smoking are well understood, more than 60% of children try smoking before they are 18 years old, and more than half who have smoked have tried and failed to quit (Fryar, Merino, Hirsch, & Porter, 2009).[46]Although smoking is depicted in movies as sexy and alluring, it is highly addictive and probably the most dangerous thing we can do to our body. Poor diet and physical inactivity combine to make up the second greatest threat to our health. But we can improve our diet by eating more natural and less processed food, and by monitoring our food intake. And we can start and maintain an exercise program. Exercise keeps us happier, improves fitness, and leads to better health and lower mortality (Vogel-John, 2010; Galper, Trivedi, Barlow, Dunn, & Kampert, 2006; Hassmén, Koivula, & Uutela, 2000).[47] And exercise also has a variety of positive influences on our cognitive processes, including academic performance (Hillman, Erickson, & Kramer, 2008).[48]

Alcohol abuse, and particularly binge drinking (i.e., having five or more drinks in one sitting), is often the norm among high school and college students, but it has severe negative health consequences. Bingeing leads to deaths from car crashes, drowning, falls, gunshots, and alcohol poisoning (Valencia-Martín, Galán, & Rodríguez-Artalejo, 2008).[49] Binge-drinking students are also more likely to be involved in other risky behaviors, such as smoking, drug use, dating violence, or attempted suicide (Miller, Naimi, Brewer, & Jones, 2007).[50] Binge drinking may also damage neural pathways in the brain (McQueeny et al., 2009)[51] and lead to lifelong alcohol abuse and dependency (Kim et al., 2008).[52] Illicit drug use has also been increasing and is linked to the spread of infectious diseases such as HIV, hepatitis B, and hepatitis C (Monteiro, 2001).[53]

Some teens abstain from sex entirely, particularly those who are very religious, but most experiment with it. About half of U.S. children under 18 report having had intercourse, a rate much higher than in other parts of the world. Although sex is fun, it can also kill us if we are not careful. Sexual activity can lead to guilt about having engaged in the act itself, and may also lead to unwanted pregnancies and sexually transmitted infections (STIs), including HIV

[12] Crandall, C. S. (1988). Social contagion of binge eating. *Journal of Personality & Social Psychology, 55*(4), 588–598.

[13] Crandall, C. S., Merman, A., & Hebl, M. (2009). Anti-fat prejudice. In T. D. Nelson (Ed.),*Handbook of prejudice, stereotyping, and discrimination* (pp. 469–487). New York, NY: Psychology Press.

[14] Gustafson, D., Rothenberg, E., Blennow, K., Steen, B., & Skoog, I. (2003). An 18-year follow-up of overweight and risk of Alzheimer disease. *Archives of Internal Medicine, 163*(13), 1524.

[15] Haslam, D. W., & James, W. P. (2005). Obesity. *Lancet, 366*(9492), 197–209. doi:10.1016/S0140-6736(05)67483-1

[16] Nestle, M., & Jacobson, M. F. (2000). Halting the obesity epidemic: A public health policy approach. *Public Health Reports, 115*(1), 12–24. doi:10.1093/phr/115.1.12; James, W. P. (2008). The fundamental drivers of the obesity epidemic. *Obesity Review, 9*(Suppl. 1), 6–13.

[17] Miller, W. C. (1999). How effective are traditional dietary and exercise interventions for weight loss? *Medicine & Science in Sports & Exercise, 31*(8), 1129–1134.

[18] Douketis, J. D., Macie C., Thabane, L., & Williamson, D. F. (2005). Systematic review of long-term weight loss studies in obese adults: Clinical significance and applicability to clinical practice. *International Journal of Obesity, 29*, 1153–1167. doi:10.1038/sj.ijo.0802982

[19] Boyle, K.T. (2008). How effective is exercise in producing fat loss? *Kinesiology, 40*(2), 126–137.

[20] American Heart Association. (1998). Statement on exercise, benefits and recommendations for physical activity programs for all Americans. *American Heart Association, 94*, 857–862. Retrieved fromhttp://circ.ahajournals.org/cgi/content/full/94/4/857?ijkey=6e9ad2e53ba5b25f9002a707e5e4b5b8ee015481&keytype2=tf_ipsecsha

[21] Kramer, A. F., Erickson, K. I., & Colcombe, S. J. (2006). Exercise, cognition, and the aging brain. *Journal of Applied Physiology, 101*(4), 1237–1242.

[22] Schomer, H., & Drake, B. (2001). Physical activity and mental health. *International SportMed Journal, 2*(3), 1. Retrieved from Academic Search Premier Database.

[50] Miller, J., Naimi, T., Brewer, R., & Jones, S. (2007). Binge drinking and associated health risk behaviors among high school students. *Pediatrics, 119*(1), 76–85. doi:10.1542/peds.2006–1517

[51] McQueeny, T., Schweinsburg, B., Schweinsburg, A., Jacobus, J., Bava, S., Frank, L.,…Tapert, S. F. (2009). Altered white matter integrity in adolescent binge drinkers. *Alcoholism: Clinical & Experimental Research, 33*(7), 1278–1285. doi:10.1111/j.1530-0277.2009.00953.x

[52] Kim, J., Sing, L., Chow, J., Lau, J., Tsang, A., Choi, J.,…Griffiths, S. M. (2008). Prevalence and the factors associated with binge drinking, alcohol abuse, and alcohol dependence: A population-based study of Chinese adults in Hong Kong. *Alcohol & Alcoholism, 43*(3), 360–370. doi:10.1093/Alcalc/Agm181

[53] Monteiro, M. (2001). A World Health Organization perspective on alcohol and illicit drug use and health. *European Addiction Research, 7*(3), 98–103. doi:10.1159/000050727

[54] Hutton, H., McCaul, M., Santora, P., & Erbelding, E. (2008). The relationship between recent alcohol use and sexual behaviors: Gender differences among sexually transmitted disease clinic patients. *Alcoholism: Clinical & Experimental Research, 32*(11), 2008–2015; Raj, A., Reed, E., Santana, M., Walker, A., Welles, S., Horsburgh, C.,…Silverman, J. G. (2009). The associations of binge alcohol use with HIV/STI risk and diagnosis among heterosexual African American men. *Drug & Alcohol Dependence, 104*(1/2), 101–106.

10.5 Chapter Summary

Affect guides behavior, helps us make decisions, and has a major impact on our mental and physical health. Affect is guided by arousal—our experiences of the bodily responses created by the sympathetic division of the autonomic nervous system.

Emotions are the mental and physiological feeling states that direct our attention and guide our behavior. The most fundamental emotions, known as the basic emotions, are those of anger, disgust, fear, happiness, sadness, and surprise. A variety of secondary emotions are determined by the process of cognitive appraisal. The distinction between the primary and the secondary emotions is paralleled by two brain pathways: a fast pathway and a slow pathway.

Sex is a fundamental motivation that involves the coordination of a wide variety of behaviors, including courtship, sex, household arrangements, parenting, and child care. The sexual response cycle is similar in men and women. The sex hormone testosterone is particularly important for sex drive, in both men and women.

Sexual behavior varies widely, not only between men and women but within each sex.

The vast majority of human beings have a heterosexual orientation, but a smaller minority is primarily homosexual or bisexual. The love and sexual lives of homosexuals and bisexual are little different from those of heterosexuals, except where their behaviors are constrained by cultural norms and local laws.

Chapter 11
Personality

Identical Twins Reunited after 35 Years

Paula Bernstein and Elyse Schein were identical twins who were adopted into separate families immediately after their births in 1968. It was only at the age of 35 that the twins were reunited and discovered how similar they were to each other.

Paula Bernstein grew up in a happy home in suburban New York. She loved her adopted parents and older brother and even wrote an article titled "Why I Don't Want to Find My Birth Mother." Elyse's childhood, also a happy one, was followed by college and then film school abroad.

In 2003, 35 years after she was adopted, Elyse, acting on a whim, inquired about her biological family at the adoption agency. The response came back: "You were born on October 9, 1968, at 12:51 p.m., the younger of twin girls. You've got a twin sister Paula and she's looking for you."

"Oh my God, I'm a *twin*! Can you believe this? Is this really happening?" Elyse cried.

Elyse dialed Paula's phone number: "It's almost like I'm hearing my own voice in a recorder back at me," she said. "It's funny because I feel like in a way I was talking to an old, close friend I never knew I had...we had an immediate intimacy, and yet, we didn't know each other at all," Paula said.

The two women met for the first time at a café for lunch and talked until the late evening.

Figure 11.1 *Phrenology*

As with intelligence tests, the utility of self-report measures of personality depends on their *reliability* and *construct validity*. Some popular measures of personality are not useful because they are unreliable or invalid. Perhaps you have heard of a personality test known as the Myers-Briggs Type Indicator (MBTI). If so, you are not alone, because the MBTI is the most widely administered personality test in the world, given millions of times a year to employees in thousands of companies. The MBTI categorizes people into one of four categories on each of four dimensions: *introversion* versus *extraversion*,*sensing* versus *intuiting*, *thinking* versus *feeling*, and *judging* versus*perceiving*.

Although completing the MBTI can be useful for helping people think about individual differences in personality, and for "breaking the ice" at meetings, the measure itself is not psychologically useful because it is not reliable or valid. People's classifications change over time, and scores on the MBTI do not relate to other measures of personality or to behavior (Hunsley, Lee, & Wood, 2003).[5] Measures such as the MBTI remind us that it is important to scientifically and empirically test the effectiveness of personality tests by assessing their stability over time and their ability to predict behavior.

One of the challenges of the trait approach to personality is that there are so many of them; there are at least 18,000 English words that can be used to describe people (Allport & Odbert, 1936).[6] Thus a major goal of psychologists is to take this vast number of descriptors (many of which are very similar to each other) and to determine the underlying important or "core" traits among them (John, Angleitner, & Ostendorf, 1988).[7]

The trait approach to personality was pioneered by early psychologists, including Gordon Allport (1897–1967), Raymond Cattell (1905–1998), and Hans Eysenck (1916–1997). Each of these psychologists believed in the idea of the trait as the stable unit of personality, and each attempted to provide a list or taxonomy of the most important trait dimensions. Their approach was to provide people with a self-report measure and then to use statistical analyses to look for the

A large body of research evidence has supported the five-factor model. The Big Five dimensions seem to be cross-cultural, because the same five factors have been identified in participants in China, Japan, Italy, Hungary, Turkey, and many other countries (Triandis & Suh, 2002).[12] The Big Five dimensions also accurately predict behavior. For instance, a pattern of high conscientiousness, low neuroticism, and high agreeableness predicts successful job performance (Tett, Jackson, & Rothstein, 1991).[13] Scores on the Big Five dimensions also predict the performance of U.S. presidents; ratings of openness to experience are correlated positively with ratings of presidential success, whereas ratings of agreeableness are correlated negatively with success (Rubenzer, Faschingbauer, & Ones, 2000).[14] The Big Five factors are also increasingly being used in helping researchers understand the dimensions of psychological disorders such as anxiety and depression (Oldham, 2010; Saulsman & Page, 2004).[15]

An advantage of the five-factor approach is that it is parsimonious. Rather than studying hundreds of traits, researchers can focus on only five underlying dimensions. The Big Five may also capture other dimensions that have been of interest to psychologists. For instance, the trait dimension of *need for achievement* relates to the Big Five variable of conscientiousness, and *self-esteem* relates to low neuroticism. On the other hand, the Big Five factors do not seem to capture all the important dimensions of personality. For instance, the Big Five does not capture moral behavior, although this variable is important in many theories of personality. And there is evidence that the Big Five factors are not exactly the same across all cultures (Cheung & Leung, 1998).[16]

Situational Influences on Personality

One challenge to the trait approach to personality is that traits may not be as stable as we think they are. When we say that Malik is friendly, we mean that Malik is friendly today and will be friendly tomorrow and even next week. And we mean that Malik is friendlier than average in all situations. But what if Malik were found to behave in a friendly way with his family members but to be unfriendly with his fellow classmates? This would clash with the idea that traits are stable across time and situation.

To interpret the results, the clinician looks at the pattern of responses across the different subscales and makes a diagnosis about the potential psychological problems facing the patient. Although clinicians prefer to interpret the patterns themselves, a variety of research has demonstrated that computers can often interpret the results as well as can clinicians (Garb, 1998; Karon, 2000).[28] Extensive research has found that the MMPI-2 can accurately predict which of many different psychological disorders a person suffers from (Graham, 2006).[29]

One potential problem with a measure like the MMPI is that it asks people to consciously report on their inner experiences. But much of our personality is determined by unconscious processes of which we are only vaguely or not at all aware. Projective measures are *measures of personality in which unstructured stimuli, such as ink blots, drawings of social situations, or incomplete sentences, are shown to participants, who are asked to freely list what comes to mind as they think about the stimuli*. Experts then score the responses for clues to personality. The proposed advantage of these tests is that they are more indirect—they allow the respondent to freely express whatever comes to mind, including perhaps the contents of their unconscious experiences.

One commonly used projective test is the *Rorschach Inkblot Test*, developed by the Swiss psychiatrist Hermann Rorschach (1884–1922). TheRorschach Inkblot Test is *a projective measure of personality in which the respondent indicates his or her thoughts about a series of 10 symmetrical inkblots* (Figure 11.5 "Rorschach Inkblots"). The Rorschach is administered

millions of time every year. The participants are asked to respond to the inkblots, and their responses are systematically scored in terms of what, where, and why they saw what they saw. For example, people who focus on the details of the inkblots may have obsessive-compulsive tendencies, whereas those who talk about sex or aggression may have sexual or aggressive problems.

TheThematic Apperception Test (TAT) is *a projective measure of personality in which the respondent is asked to create stories about sketches of ambiguous situations, most of them of people, either alone or with others*(Figure 11.6 "Sample Card From the TAT"). The sketches are shown to individuals, who are asked to tell a story about what is happening in the picture. The TAT assumes that people may be unwilling or unable to admit their true feelings when asked directly but that these feelings will show up in the stories about the pictures. Trained coders read the stories and use them to develop a personality profile of the respondent.

Other popular projective tests include those that ask the respondent to draw pictures, such as the Draw-A-Person test (Machover, 1949),[30] and free association tests in which the respondent quickly responds with the first word that comes to mind when the examiner says a test word. Another approach is the use of "anatomically correct" dolls that feature representations of the male and female genitals. Investigators allow children to play with the dolls and then try to determine on the basis of the play if the children may have been sexually abused.

The advantage of projective tests is that they are less direct, allowing people to avoid using their defense mechanisms and therefore show their "true" personality. The idea is that when people view ambiguous stimuli they will describe them according to the aspects of personality that are most important to them, and therefore bypass some of the limitations of more conscious responding.

Despite their widespread use, however, the empirical evidence supporting the use of projective tests is mixed (Karon, 2000; Wood, Nezworski, Lilienfeld, & Garb, 2003).[31] The reliability of the measures is low because people often produce very different responses on different occasions. The construct validity of the measures is also suspect because there are very few consistent associations between Rorschach scores or TAT scores and most personality traits. The projective tests often fail to distinguish between people with psychological disorders and those without or to correlate with other measures of personality or with behavior.

The *anal stage*, lasting from about 18 months to 3 years of age is when children first experience psychological conflict. During this stage children desire to experience pleasure through bowel movements, but they are also being toilet trained to delay this gratification. Freud believed that if this toilet training was either too harsh or too lenient, children would become fixated in the anal stage and become likely to regress to this stage under stress as adults. If the child received too little anal gratification (i.e., if the parents had been very harsh about toilet training), the adult personality will be *anal retentive*—stingy, with a compulsive seeking of order and tidiness. On the other hand, if the parents had been too lenient, the *anal expulsive* personality results, characterized by a lack of self-control and a tendency toward messiness and carelessness.

The *phallic stage*, which lasts from age 3 to age 6 is when the penis (for boys) and clitoris (for girls) become the primary erogenous zone for sexual pleasure. During this stage, Freud believed that children develop a powerful but unconscious attraction for the opposite-sex parent, as well as a desire to eliminate the same-sex parent as a rival. Freud based his theory of sexual development in boys (the "Oedipus complex") on the Greek mythological character Oedipus, who unknowingly killed his father and married his mother, and then put his own eyes out when he learned what he had done. Freud argued that boys will normally eventually abandon their love of the mother, and instead identify with the father, also taking on the father's personality characteristics, but that boys who do not successfully resolve the Oedipus complex will experience psychological problems later in life. Although it was not as important in Freud's theorizing, in girls the phallic stage is often termed the "Electra complex," after the Greek character who avenged her father's murder by killing her mother. Freud believed that girls frequently experienced *penis envy*, the sense of deprivation supposedly experienced by girls because they do not have a penis.

The *latency stage* is a period of relative calm that lasts from about 6 years to 12 years. During this time, Freud believed that sexual impulses were repressed, leading boys and girls to have little or no interest in members of the opposite sex.

According to Adler, most psychological disorders result from misguided attempts to compensate for the inferiority complex in order meet the goal of superiority.

Carl Jung (1875–1961) was another student of Freud who developed his own theories about personality. Jung agreed with Freud about the power of the unconscious but felt that Freud overemphasized the importance of sexuality. Jung argued that in addition to the personal unconscious, there was also acollective unconscious, or *a collection of shared ancestral memories*. Jung believed that the collective unconscious contains a variety of *archetypes*, or cross-culturally universal symbols, which explain the similarities among people in their emotional reactions to many stimuli. Important archetypes include the mother, the goddess, the hero, and the mandala or circle, which Jung believed symbolized a desire for wholeness or unity. For Jung, the underlying motivation that guides successful personality is *self-realization*, or learning about and developing the self to the fullest possible extent.

Karen Horney (the last syllable of her last name rhymes with "eye", 1885–1952), was a German physician who applied Freudian theories to create a personality theory that she thought was more balanced between men and women. Horney believed that parts of Freudian theory, and particularly the ideas of the Oedipus complex and penis envy, were biased against women. Horney argued that women's sense of inferiority was not due to their lack of a penis but rather to their dependency on men, an approach that the culture made it difficult for them to break from. For Horney, the underlying motivation that guides personality development is the desire for *security*, the ability to develop appropriate and supportive relationships with others.

Another important neo-Freudian was Erich Fromm (1900–1980). Fromm's focus was on the negative impact of technology, arguing that the increases in its use have led people to feel increasingly isolated from others. Fromm believed that the independence that technology brings us also creates the need "escape from freedom," that is, to become closer to others.

Research Focus: How the Fear of Death Causes Aggressive Behavior

Fromm believed that the primary human motivation was to escape the fear of death, and contemporary research has shown how our concerns about dying can influence our behavior. In this research, people have been made to confront their death by writing about it or otherwise being reminded of it, and effects on their behavior are then observed. In one relevant study, McGregor et al. (1998)[4] demonstrated that people who are provoked may be particularly aggressive after they have been reminded of the possibility of their own death. The participants in the study had been selected, on the basis of prior reporting, to have either politically liberal or politically conservative views. When they arrived at the lab they were asked to write a short paragraph describing their opinion of politics in the United States. In addition, half of the participants (the *mortality salient condition*) were asked to "briefly describe the emotions that the thought of your own death arouses in you" and to "jot down as specifically as you can, what you think will happen to you as you physically die, and once you are physically dead." Participants in the *exam control condition* also thought about a negative event, but not one associated with a fear of death. They were instructed to "please briefly describe the emotions that the thought of your next important exam arouses in you" and to "jot down as specifically as you can, what you think will happen to you as you physically take your next exam, and once you are physically taking your next exam."

Then the participants read the essay that had supposedly just been written by another person. (The other person did not exist, but the participants didn't know this until the end of the experiment.) The essay that they read had been prepared by the experimenters to be very negative toward politically liberal views or to be very negative toward politically conservative views. Thus one-half of the participants were provoked by the other person by reading a statement that strongly conflicted with their own political beliefs, whereas the other half read an essay in which the other person's views supported their own (liberal or conservative) beliefs.

At this point the participants moved on to what they thought was a completely separate study in which they were to be tasting and giving their impression of some foods. Furthermore, they were told that it was necessary for the participants in the research to administer the food samples to each other. At this point, the participants found out that the food they were going to be sampling was spicy hot sauce and that they were going to be administering the sauce to the very person whose essay they had just read. In addition, the participants read some information about the other person that indicated that he very much disliked eating spicy food. Participants were given a taste of the hot sauce (it

[2] Dolnick, E. (1998). *Madness on the couch: Blaming the victim in the heyday of psychoanalysis.* New York, NY: Simon & Schuster.

[3] Freud, S. (1923/1949). *The ego and the id*. London, England: Hogarth Press. (Original work published 1923)

[4] McGregor, H. A., Lieberman, J. D., Greenberg, J., Solomon, S., Arndt, J., Simon, L.,…Pyszczynski, T. (1998). Terror management and aggression: Evidence that mortality salience motivates aggression against worldview-threatening others. *Journal of Personality and Social Psychology, 74*(3), 590–605.

[5] Crews, F. C. (1998). *Unauthorized Freud: Doubters confront a legend*. New York, NY: Viking Press.

[6] Fisher, S., & Greenberg, R. P. (1996). *Freud scientifically reappraised: Testing the theories and therapy*. Oxford, England: John Wiley & Sons.

[7] Kihlstrom, J. F. (1997). Memory, abuse, and science. *American Psychologist, 52*(9), 994–995.

[8] Newman, L. S., Duff, K. J., & Baumeister, R. F. (1997). A new look at defensive projection: Thought suppression, accessibility, and biased person perception. *Journal of Personality and Social Psychology, 72*(5), 980–1001.

[9] Baddeley, J. L., & Pennebaker, J. W. (2009). Expressive writing. In W. T. O'Donohue & K. E. Fisher (Eds.), *General principles and empirically supported techniques of cognitive behavior therapy* (pp. 295–299). Hoboken, NJ: John Wiley & Sons.

[10] Kihlstrom, J. F. (1987). The cognitive unconscious. *Science, 237*(4821), 1445–1452.

[11] Maslow, Abraham (1970). *Motivation and personality* (2nd ed.). New York, NY: Harper.

[12] Prochaska, J. O., & Norcross, J. C. (2001). *Systems of psychotherapy: A transtheoretical analysis* (6th ed.). Pacific Grove, CA: Brooks/Cole; Yalom, I. (1995). Introduction. In C. Rogers, *A way of being*. (1980). New York, NY: Houghton Mifflin.

[13] Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 5–14.

[14] Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology, 51*(1), 5–15; Strauman, T. J., & Higgins, E. T. (1988). Self-discrepancies as predictors of vulnerability to distinct syndromes of chronic emotional distress. *Journal of Personality, 56*(4), 685–707.

[15] Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology, 51*(1), 5–15.

One approach that can be used in animals, usually in laboratory mice, is the *knockout study*. In this approach the researchers use specialized techniques to remove or modify the influence of a gene in a line of "knockout" mice (Crusio, Goldowitz, Holmes, & Wolfer, 2009).[9] The researchers harvest embryonic stem cells from mouse embryos and then modify the DNA of the cells. The DNA is created such that the action of certain genes will be eliminated or "knocked out." The cells are then injected into the embryos of other mice that are implanted into the uteruses of living female mice. When these animals are born, they are studied to see whether their behavior differs from a control group of normal animals. Research has found that removing or changing genes in mice can affect their anxiety, aggression, learning, and socialization patterns.

In humans, a molecular genetics study normally begins with the collection of a DNA sample from the participants in the study, usually by taking some cells from the inner surface of the cheek. In the lab, the DNA is extracted from the sampled cells and is combined with a solution containing a marker for the particular genes of interest as well as a fluorescent dye. If the gene is present in the DNA of the individual, then the solution will bind to that gene and activate the dye. The more the gene is expressed, the stronger the reaction.

In one common approach, DNA is collected from people who have a particular personality characteristic and also from people who do not. The DNA of the two groups is compared to see which genes differ between them. These studies are now able to compare thousands of genes at the same time. Research using molecular genetics has found genes associated with a variety of personality traits including novelty-seeking (Ekelund, Lichtermann, Järvelin, & Peltonen, 1999),[10] attention-deficit/hyperactivity disorder (Waldman & Gizer, 2006),[11] and smoking behavior (Thorgeirsson et al., 2008).[12]

Reviewing the Literature: Is Our Genetics Our Destiny?

Over the past two decades scientists have made substantial progress in understanding the important role of genetics in behavior. Behavioral genetics studies have found that, for most

the unconscious. Freud proposed that the mind is divided into three components: id, ego, and superego, and that the interactions and conflicts among the components create personality. Freud also believed that psychological disorders, and particularly the experience of anxiety, occur when there is conflict or imbalance among the motivations of the id, ego, and superego and that people use defense mechanisms to cope with this anxiety.

Freud argued that personality is developed through a series of psychosexual stages, each focusing on pleasure from a different part of the body, and that the appropriate resolution of each stage has implications for later personality development.

Freud has probably exerted a greater impact on the public's understanding of personality than any other thinker, but his theories have in many cases failed to pass the test of empiricism.

Freudian theory led to a number of followers known as the neo-Freudians, including Adler, Jung, Horney, and Fromm.

Humanistic theories of personality focus on the underlying motivations that they believed drive personality, focusing on the nature of the self-concept and the development of self-esteem. The idea of unconditional positive regard championed by Carl Rogers has led in part to the positive psychology movement, and it is a basis for almost all contemporary psychological therapy.

Personality traits of humans and animals are determined in large part by their genetic makeup. Personality is not determined by any single gene, but rather by the actions of many genes working together.

The role of nature and nurture in personality is studied by means of behavioral genetics studies including family studies, twin studies, and adoption studies. These studies partition variability in personality into the influence of genetics (known as heritability), shared environment, and nonshared environment. Although these studies find that many personality traits are highly heritable, genetics does not determine everything. The major influence on personality is nonshared environmental influences.

In addition to the use of behavioral genetics, our understanding of the role of biology in personality recently has been dramatically increased through the use of molecular genetics, the study of which genes are associated with which personality traits in animals and humans.

"normal" everyday life. Washing one's hands is a normal healthy activity, but it can be overdone by those with an *obsessive-compulsive disorder (OCD)*. It is not unusual to worry about and try to improve one's body image, but Robert's struggle with his personal appearance, as discussed at the beginning of this chapter, was clearly unusual, unhealthy, and distressing to him.

Whether a given behavior is considered a psychological disorder is determined not only by whether a behavior is *unusual* (e.g., whether it is "mild" anxiety versus "extreme" anxiety) but also by whether a behavior is maladaptive—that is, the extent to which it causes *distress* (e.g., pain and suffering) and *dysfunction* (impairment in one or more important areas of functioning) to the individual (American Psychiatric Association, 2000).[6] An intense fear of spiders, for example, would not be considered a psychological disorder unless it has a significant negative impact on the sufferer's life, for instance by causing him or her to be unable to step outside the house. The focus on distress and dysfunction means that behaviors that are simply unusual (such as some political, religious, or sexual practices) are not classified as disorders.

Put your psychology hat on for a moment and consider the behaviors of the people listed in Table 12.2 "Diagnosing Disorder". For each, indicate whether you think the behavior is or is not a psychological disorder. If you're not sure, what other information would you need to know to be more certain of your diagnosis?

Table 12.2 Diagnosing Disorder

Yes	No	Need more information	Description
			Jackie frequently talks to herself while she is working out her math homework. Her roommate sometimes hears her and wonders if she is OK.
			Charlie believes that the noises made by cars and planes going by outside his house have secret meanings. He is convinced that he was involved in the start of a nuclear war and that the only way for him to survive is to find the answer to a difficult riddle.
			Harriet gets very depressed during the winter months when the light is low. She sometimes stays in her pajamas for the whole weekend, eating chocolate and

the category are said to have that disorder. The*DSM* frequently uses qualifiers to indicate different levels of severity within a category. For instance, the disorder of mental retardation can be classified as mild, moderate, or severe.

Each revision of the *DSM* takes into consideration new knowledge as well as changes in cultural norms about disorder. Homosexuality, for example, was listed as a mental disorder in the *DSM* until 1973, when it was removed in response to advocacy by politically active gay rights groups and changing social norms. The current version of the *DSM* lists about 400 disorders. Some of the major categories are shown in Table 12.3 "Categories of Psychological Disorders Based on the ", and you may go to http://en.wikipedia.org/wiki/DSM-IV_Codes_(alphabetical) and browse the complete list.

Table 12.3 Categories of Psychological Disorders Based on the *DSM*

Category and description	Example
Disorders diagnosed in infancy and childhood	Mental retardation
	Communication, conduct, elimination, feeding, learning, and motor skills disorders
	Autism spectrum disorders
	Attention-deficit and disruptive behavior disorders including attention-deficit/hyperactivity disorder (ADHD)
	Separation anxiety disorder
Delirium, dementia, and amnesia (forgetting or memory distortions caused by physical factors)	Delirium
	Dementia and Alzheimer disease
Dissociative disorders (forgetting or memory distortions that do not involve physical factors)	Dissociative amnesia
	Dissociative fugue
	Dissociative identity disorder (“multiple personality”)
Substance abuse disorders	Alcohol abuse
	Drug abuse

Autistic Disorder and Asperger's Disorder

Jared's kindergarten teacher has voiced her concern to Jared's parents about his difficulties with interacting with other children and his delay in developing normal language. Jared is able to maintain eye contact and enjoys mixing with other children, but he cannot communicate with them very well. He often responds to questions or comments with long-winded speeches about trucks or some other topic that interests him, and he seems to lack awareness of other children's wishes and needs.

Jared's concerned parents took him to a multidisciplinary child development center for consultation. Here he was tested by a pediatric neurologist, a psychologist, and a child psychiatrist.

The pediatric neurologist found that Jared's hearing was normal, and there were no signs of any neurological disorder. He diagnosed Jared with a *pervasive developmental disorder*, because while his comprehension and expressive language was poor, he was still able to carry out nonverbal tasks, such as drawing a picture or doing a puzzle.

Based on her observation of Jared's difficulty interacting with his peers, and the fact that he did not respond warmly to his parents, the psychologist diagnosed Jared with autistic disorder (autism), *a disorder of neural development characterized by impaired social interaction and communication and by restricted and repetitive behavior, and in which symptoms begin before 7 years of age*. The psychologist believed that the autism diagnosis was correct because, like other children with autism, Jared, has a poorly developed ability to see the world from the perspective of others; engages in unusual behaviors such as talking about trucks for hours; and responds to stimuli, such as the sound of a car or an airplane, in unusual ways.

The child psychiatrist believed that Jared's language problems and social skills were not severe enough to warrant a diagnosis of autistic disorder and instead proposed a diagnosis of Asperger's disorder, *a developmental disorder that affects a child's ability to socialize and*

- The impact on people with a psychological disorder comes both from the disease itself and from the stigma associated with disorder.
- A psychological disorder is an ongoing dysfunctional pattern of thought, emotion, and behavior that causes significant distress and that is considered deviant in that person's culture or society.
- According to the bio-psycho-social model, psychological disorders have biological, psychological, and social causes.
- It is difficult to diagnose psychological disorders, although the *DSM* provides guidelines that are based on a category system. The *DSM* is frequently revised, taking into consideration new knowledge as well as changes in cultural norms about disorder.
- There is controversy about the diagnosis of disorders such as ADHD, autistic disorder, and Asperger's disorder.

EXERCISES AND CRITICAL THINKING

1. Do you or your friends hold stereotypes about the mentally ill? Can you think of or find clips from any films or other popular media that portray mental illness positively or negatively? Is it more or less acceptable to stereotype the mentally ill than to stereotype other social groups?
2. Consider the psychological disorders listed in Table 12.3 "Categories of Psychological Disorders Based on the ". Do you know people who may suffer from any of these? Can you or have you talked to them about their experiences? If so, how do they experience the illness?
3. Consider the diagnosis of ADHD, autism, and Asperger's disorder from the biological, personal, and social-cultural perspectives. Do you think that these disorders are overdiagnosed? How might clinicians determine if ADHD is dysfunctional or distressing to the individual?

[1] Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month *DSM-IV* disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 617–627.

[2] Butcher, J., Mineka, S., & Hooley, J. (2007). *Abnormal psychology and modern life* (13th ed.). Boston, MA: Allyn & Bacon.

[24] Burt, S. A., Krueger, R. F., McGue, M., & Iacono, W. G. (2001). Sources of covariation among attention-deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder: The importance of shared environment. *Journal of Abnormal Psychology, 110*(4), 516–525.

[25] Kogan, M., Blumberg, S., Schieve, L., Boyle, C., Perrin, J., Ghandour, R.,…van Dyck, P. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics, 124*(5), 1395–1403. doi:10.1542/peds.2009-1522

[26] Freitag C. M. (2007). The genetics of autistic disorders and its clinical relevance: A review of the literature. *Molecular Psychiatry, 12*(1), 2–22.

[27] Moldin, S. O. (2003). Editorial: Neurobiology of autism: The new frontier. *Genes, Brain & Behavior, 2*(5), 253–254.

12.2 Anxiety and Dissociative Disorders: Fearing the World Around Us

LEARNING OBJECTIVES

1. Outline and describe the different types of anxiety disorders.
2. Outline and describe the different types of dissociative disorders.
3. Explain the biological and environmental causes of anxiety and dissociative disorders.

Anxiety, *the nervousness or agitation that we sometimes experience, often about something that is going to happen*, is a natural part of life. We all feel anxious at times, maybe when we think about our upcoming visit to the dentist or the presentation we have to give to our class next week. Anxiety is an important and useful human emotion; it is associated with the activation of the sympathetic nervous system and the physiological and behavioral responses that help protect us from danger. But too much anxiety can be debilitating, and every year millions of people suffer from anxiety disorders, which are*psychological disturbances marked by irrational fears, often of everyday objects and situations* (Kessler, Chiu, Demler, & Walters, 2005).[1]

Generalized Anxiety Disorder

Consider the following, in which "Chase" describes her feelings of a persistent and exaggerated sense of anxiety, even when there is little or nothing in her life to provoke it:

clinical psychology (pp. 109–142). New York, NY: Guilford Press; Lipsanen, T., Korkeila, J., Peltola, P., Jarvinen, J., Langen, K., & Lauerma, H. (2004). Dissociative disorders among psychiatric patients: Comparison with a nonclinical sample. *European Psychiatry, 19*(1), 53–55.

[26] Miller, M., & Kantrowitz, B. (1999, January 25). Unmasking Sybil: A reexamination of the most famous psychiatric patient in history. *Newsweek*, pp. 11–16.

[27] Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001). A review and meta-analysis of the genetic epidemiology of anxiety disorders. *The American Journal of Psychiatry, 158*(10), 1568–1578.

[28] Smoller, J., Paulus, M., Fagerness, J., Purcell, S., Yamaki, L., Hirshfeld-Becker, D.,…Stein, M. (2008). Influence of RGS2 on anxiety-related temperament, personality, and brain function. *Archives of General Psychiatry, 65*(3), 298–308. doi:10.1001/archgenpsychiatry.2007.48; Thoeringer, C., Ripke, S., Unschuld, P., Lucae, S., Ising, M., Bettecken, T.,…Erhardt, A. (2009). The GABA transporter 1 (SLC6A1): A novel candidate gene for anxiety disorders. *Journal of Neural Transmission, 116*(6), 649–657. doi:10.1007/s00702-008-0075-y

[29] Brown, T., & McNiff, J. (2009). Specificity of autonomic arousal to *DSM-IV* panic disorder and posttraumatic stress disorder. *Behaviour Research and Therapy, 47*(6), 487–493. doi:10.1016/j.brat.2009.02.016; Damsa, C., Kosel, M., & Moussally, J. (2009). Current status of brain imaging in anxiety disorders. *Current Opinion in Psychiatry, 22*(1), 96–110. doi:10.1097/YCO.0b013e32831e9ed1

[30] Gilbertson, M. W., Shenton, M. E., Ciszewski, A., Kasai, K., Lasko, N. B., Orr, S. P.,…Pitman, R. K. (2002). Smaller hippocampal volume predicts pathologic vulnerability to psychological trauma. *Nature Neuroscience, 5*(11), 1242.

[31] Stein, M., Schork, N., & Gelernter, J. (2008). Gene-by-environment (serotonin transporter and childhood maltreatment) interaction for anxiety sensitivity, an intermediate phenotype for anxiety disorders. *Neuropsychopharmacology, 33*(2), 312–319. doi:10.1038/sj.npp.1301422

[32] Twenge, J. (2006). *Generation me*. New York, NY: Free Press.

[33] Alpher, V. S. (1992). Introject and identity: Structural-interpersonal analysis and psychological assessment of multiple personality disorder. *Journal of Personality Assessment. 58*(2), 347–367. doi:10.1207/s15327752jpa5802_12; Cardeña, E., & Gleaves, D. (2007). Dissociative disorders. In M. M. Hersen, S. M. Turner, & D. C. Beidel (Eds.), *Adult psychological disorder and diagnosis* (5th ed., pp. 473–503). Hoboken, NJ: John Wiley & Sons.

Association of Suicidology, 2010; American Foundation for Suicide Prevention, 2007; Sudak, 2005).[7]

Behaviors Associated with Depression

- Changes in appetite; weight loss or gain
- Difficulty concentrating, remembering details, and making decisions
- Fatigue and decreased energy
- Feelings of hopelessness, helplessness, and pessimism
- Increased use of alcohol or drugs
- Irritability, restlessness
- Loss of interest in activities or hobbies once pleasurable, including sex
- Loss of interest in personal appearance
- Persistent aches or pains, headaches, cramps, or digestive problems that do not improve with treatment
- Sleep disorders, either trouble sleeping or excessive sleeping
- Thoughts of suicide or attempts at suicide

Dysthymia and Major Depressive Disorder

The level of depression observed in people with mood disorders varies widely. People who experience depression for many years, such that it becomes to seem normal and part of their everyday life, and who feel that they are rarely or never happy, will likely be diagnosed with a mood disorder. If the depression is mild but long-lasting, they will be diagnosed with dysthymia, *a condition characterized by mild, but chronic, depressive symptoms that last for at least 2 years*.

If the depression continues and becomes even more severe, the diagnosis may become that of *major depressive disorder*.Major depressive disorder (clinical depression) is *a mental disorder characterized by an all-encompassing low mood accompanied by low self-esteem and by loss of interest or pleasure in normally enjoyable activities*. Those who suffer from major depressive disorder feel an intense sadness, despair, and loss of interest in pursuits that once gave them

Research Focus: Using Molecular Genetics to Unravel the Causes of Depression

Avshalom Caspi and his colleagues (Caspi et al., 2003)[17] used a longitudinal study to test whether genetic predispositions might lead some people, but not others, to suffer from depression as a result of environmental stress. Their research focused on a particular gene, the 5-HTT gene, which is known to be important in the production and use of the neurotransmitter *serotonin*. The researchers focused on this gene because serotonin is known to be important in depression, and because selective serotonin reuptake inhibitors (SSRIs) have been shown to be effective in treating depression.

People who experience stressful life events, for instance involving threat, loss, humiliation, or defeat, are likely to experience depression. But biological-situational models suggest that a person's sensitivity to stressful events depends on his or her genetic makeup. The researchers therefore expected that people with one type of genetic pattern would show depression following stress to a greater extent than people with a different type of genetic pattern.

The research included a sample of 1,037 adults from Dunedin, New Zealand. Genetic analysis on the basis of DNA samples allowed the researchers to divide the sample into two groups on the basis of the characteristics of their 5-HTT gene. One group had a short version (or *allele*) of the gene, whereas the other group did not have the short allele of the gene.

The participants also completed a measure where they indicated the number and severity of stressful life events that they had experienced over the past 5 years. The events included employment, financial, housing, health, and relationship stressors. The dependent measure in the study was the level of depression reported by the participant, as assessed using a structured interview test (Robins, Cottler, Bucholtz, & Compton, 1995).[18]

As you can see in Figure 12.12 "Results From Caspi et al., 2003", as the number of stressful experiences the participants reported increased from 0 to 4, depression also significantly increased for the participants with the short version of the gene (top panel). But for the participants who did not have a short allele, increasing stress did not increase depression (bottom panel). Furthermore, for the participants who experienced 4 stressors over the past 5 years, 33% of the participants who carried the short version of the gene became depressed, whereas only 17% of participants who did not have the short version did.

Figure 12.12 *Results From Caspi et al., 2003*

cognitions to be more positive. Negative moods also create negative behaviors toward others, such as acting sad, slouching, and avoiding others, which may lead those others to respond negatively to the person, for instance by isolating that person, which then creates even more depression (Figure 12.13 "Cycle of Depression"). You can see how it might become difficult for people to break out of this "cycle of depression."

Figure 12.13 Cycle of Depression

Negative emotions create negative behaviors, which lead people to respond negatively to the individual, creating even more depression.

Weissman et al. (1996)[19] found that rates of depression varied greatly among countries, with the highest rates in European and American countries and the lowest rates in Asian countries. These differences seem to be due to discrepancies between individual feelings and cultural expectations about what one *should* feel. People from European and American cultures report that it is important to experience emotions such as happiness and excitement, whereas the Chinese report that it is more important to be stable and calm. Because Americans may feel that

[15] Warner-Schmidt, J. L., & Duman, R. S. (2006). Hippocampal neurogenesis: Opposing effects of stress and antidepressant treatment. *Hippocampus, 16*, 239–249.

[16] Duman, R. S., & Monteggia, L. M. (2006). A neurotrophic model for stress-related mood disorders. *Biological Psychiatry, 59*, 1116–1127.

[17] Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H.,…Poulton, R. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science, 301*(5631), 386–389.

[18] Robins, L. N., Cottler, L., Bucholtz, K., & Compton, W. (1995). *Diagnostic interview schedule for DSM-1V*. St. Louis, MO: Washington University.

[19] Weissman, M. M., Bland, R. C., Canino, G. J., Greenwald, S., Hwu, H-G., Joyce, P. R.,…Yeh, E-K. (1996). Cross-national epidemiology of major depression and bipolar disorder.*Journal of the American Medical Association, 276*, 293–299.

[20] Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation.*Journal of Personality and Social Psychology, 90*, 288–307.

12.4 Schizophrenia: The Edge of Reality and Consciousness

LEARNING OBJECTIVES

1. Categorize and describe the three major symptoms of schizophrenia.
2. Differentiate the five types of schizophrenia, and their characteristics.
3. Identify the biological and social factors that increase the likelihood that a person will develop schizophrenia.

The term schizophrenia, which in Greek means "split mind," was first used to describe a psychological disorder by Eugen Bleuler (1857–1939), a Swiss psychiatrist who was studying patients who had very severe thought disorders.Schizophrenia is a serious psychological disorder marked by delusions, hallucinations, loss of contact with reality, inappropriate affect, disorganized speech, social withdrawal, and deterioration of adaptive behavior.

Schizophrenia is the most chronic and debilitating of all psychological disorders. It affects men and women equally, occurs in similar rates across ethnicities and across cultures, and affects at any one time approximately 3 million people in the United States (National Institute of Mental Health, 2010).[1] Onset of schizophrenia is usually between the ages of 16 and 30 and rarely

Further evidence. *Archives of general psychiatry, 53*, 25–31; Waddington J. L., Lane, A., Larkin, C., & O'Callaghan, E. (1999). The neurodevelopmental basis of schizophrenia: Clinical clues from cerebro-craniofacial dysmorphogenesis, and the roots of a lifetime trajectory of disease. *Biological Psychiatry, 46*(1), 31–9.

[26] Walker, E., Mittal, V., & Tessner, K. (2008). Stress and the hypothalamic pituitary adrenal axis in the developmental course of schizophrenia. *Annual Review of Clinical Psychology, 4*, 189–216.

[27] Walker, E., Mittal, V., & Tessner, K. (2008). Stress and the hypothalamic pituitary adrenal axis in the developmental course of schizophrenia. *Annual Review of Clinical Psychology, 4*, 189–216.

[28] Hooley, J. M., & Hiller, J. B. (1998). Expressed emotion and the pathogenesis of relapse in schizophrenia. In M. F. Lenzenweger & R. H. Dworkin (Eds.), *Origins and development of schizophrenia: Advances in experimental psychopathology* (pp. 447–468). Washington, DC: American Psychological Association.

12.5 Personality Disorders

LEARNING OBJECTIVES

1. Categorize the different types of personality disorders and differentiate antisocial personality disorder from borderline personality disorder.
2. Outline the biological and environmental factors that may contribute to a person developing a personality disorder.

To this point in the chapter we have considered the psychological disorders that fall on Axis I of the *Diagnostic and Statistical Manual of Mental Disorders*(*DSM*) categorization system. In comparison to the Axis I disorders, which may frequently be severe and dysfunctional and are often brought on by stress, the disorders that fall on Axis II are longer-term disorders that are less likely to be severely incapacitating. Axis II consists primarily of *personality disorders*. Apersonality disorder is *a disorder characterized by inflexible patterns of thinking, feeling, or relating to others that cause problems in personal, social, and work situations*. Personality disorders tend to emerge during late childhood or adolescence and usually continue throughout adulthood (Widiger, 2006).[1] The disorders can be problematic for the people who have them, but they are less likely to bring people to a therapist for treatment than are Axis I disorders.

Cluster	Personality disorder	Characteristics
		and aggressive outbursts but otherwise emotionally cold. Often jealous, guarded, secretive, overly serious.
	Schizoid	Extreme introversion and withdrawal from relationships. Prefers to be alone, little interest in others. Humorless, distant, often absorbed with own thoughts and feelings, a daydreamer. Fearful of closeness, with poor social skills, often seen as a "loner."
B. Dramatic/erratic	Antisocial	Impoverished moral sense or "conscience." History of deception, crime, legal problems, impulsive and aggressive or violent behavior. Little emotional empathy or remorse for hurting others. Manipulative, careless, callous. At high risk for substance abuse and alcoholism.
	Borderline	Unstable moods and intense, stormy personal relationships. Frequent mood changes and anger, unpredictable impulses. Self-mutilation or suicidal threats or gestures to get attention or manipulate others. Self-image fluctuations and a tendency to see others as "all good" or "all bad."
	Histrionic	Constant attention seeking. Grandiose language, provocative dress, exaggerated impressions, all to gain attention. Believes that everyone loves him. Emotional, lively, overly dramatic, enthusiastic, and excessively flirtatious.
	Narcissistic	Inflated sense of self-importance, absorbed by fantasies of self and success. Exaggerates own achievement, assumes others will recognize they are superior. Good first impressions but poor longer-term relationships. Exploitative of others.
C. Anxious/inhibited	Avoidant	Socially anxious and uncomfortable unless he or she is confident of being liked. In contrast with schizoid person, yearns for social contact. Fears criticism and worries about being embarrassed in front of others. Avoids social situations due to fear of rejection.
	Dependent	Submissive, dependent, requiring excessive approval, reassurance, and advice. Clings to people and fears losing them. Lacking self-confidence. Uncomfortable when alone. May be devastated by end of close relationship or suicidal if breakup is threatened.
	Obsessive-compulsive	Conscientious, orderly, perfectionist. Excessive need to do everything "right." Inflexibly high standards and caution can interfere with his or her productivity. Fear

diagnostic tests such as urine samples to mimic disease, or even injure themselves to bring on more symptoms. In the more severe form of factitious disorder known as*Münchausen syndrome*, the patient has a lifelong pattern of a series of successive hospitalizations for faked symptoms.

Factitious disorder is distinguished from another related disorder known as*malingering*, which also involves fabricating the symptoms of mental or physical disorders, but where the motivation for doing so is to gain financial reward; to avoid school, work, or military service; to obtain drugs; or to avoid prosecution.

The somatoform disorders are almost always comorbid with other psychological disorders, including anxiety and depression and dissociative states (Smith et al., 2005).[2] People with BDD, for instance, are often unable to leave their house, are severely depressed or anxious, and may also suffer from other personality disorders.

Somatoform and factitious disorders are problematic not only for the patient, but they also have societal costs. People with these disorders frequently follow through with potentially dangerous medical tests and are at risk for drug addiction from the drugs they are given and for injury from the complications of the operations they submit to (Bass, Peveler, & House, 2001; Looper & Kirmayer, 2002).[3] In addition, people with these disorders may take up hospital space that is needed for people who are really ill. To help combat these costs, emergency room and hospital workers use a variety of tests for detecting these disorders.

Sexual Disorders

Sexual disorders refer to a variety of problems revolving around performing or enjoying sex. These include disorders related to *sexual function*, *gender identity*, and *sexual preference*.

Disorders of Sexual Function

Sexual dysfunction is a *psychological disorder that occurs when the physical sexual response cycle is inadequate for reproduction or for sexual enjoyment*. There are a variety of potential problems (Table 12.7 "Sexual Dysfunctions as Described in the "), and their nature varies for

Gender identity disorder is rare, occurring only in about 1 in every 12,000 males and 1 in every 30,000 females (Olsson & Möller, 2003).[10] The causes of GID are as of yet unknown, although they seem to be related in part to the amount of testosterone and other hormones in the uterus (Kraemer, Noll, Delsignore, Milos, Schnyder, & Hepp, 2009).[11]

The classification of GID as a mental disorder has been challenged because people who suffer from GID do not regard their own cross-gender feelings and behaviors as a disorder and do not feel that they are distressed or dysfunctional. People suffering from GID often argue that a "normal" gender identity may not necessarily involve an identification with one's own biological sex. GID represents another example, then, of how culture defines disorder, and the next edition of the *DSM* may change the categorizations used in this domain accordingly.

Paraphilias

A third class of sexual disorders relates to sexual practices and interest. In some cases sexual interest is so unusual that it is known as a paraphilia. *A sexual deviation where sexual arousal is obtained from a consistent pattern of inappropriate responses to objects or people, and in which the behaviors associated with the feelings are distressing and dysfunctional*. Paraphilias may sometimes be only fantasies, and in other cases may result in actual sexual behavior (Table 12.8 "Some Paraphilias").

Table 12.8 Some Paraphilias

Paraphilia	Behavior or fantasy that creates arousal
Bestiality	Sex with animals
Exhibitionism	Exposing genitals to an unsuspecting person
Fetishism	Nonliving or unusual objects or clothing of the opposite sex
Frotteurism	Rubbing up against unsuspecting persons

These dramatic stories of improvement from debilitating disorders can be attributed to an alternative psychological therapy, based on established behavioral principles, provided by "psychiatric service dogs." The dogs are trained to help people with a variety of mental disorders, including panic attacks, anxiety disorder, obsessive-compulsive disorder, and bipolar disorder. They help veterans of Iraq and Afghanistan cope with their traumatic brain injuries as well as with PTSD.

The dogs are trained to perform specific behaviors that are helpful to their owners. If the dog's owner is depressed, the dog will snuggle up and offer physical comfort; if the owner is having a panic attack, the owner can calm himself by massaging the dog's body. The serenity shown by the dogs in all situations seems to reassure the PTSD sufferer that all must be well. Service dogs are constant, loving companions who provide emotional support and companionship to their embattled, often isolated owners (Shim, 2008; Lorber, 2010; Alaimo, 2010; Schwartz, 2008). [1]

Despite the reports of success from many users, it is important to keep in mind that the utility of psychiatric service dogs has not yet been tested, and thus would never be offered as a therapy by a trained clinician or paid for by an insurance company. Although interaction between humans and dogs can create positive physiological responses (Odendaal, 2000), [2] whether the dogs actually help people recover from PTSD is not yet known.

Psychological disorders create a tremendous individual, social, and economic drain on society. Disorders make it difficult for people to engage in productive lives and effectively contribute to their family and to society. Disorders lead to disability and absenteeism in the workplace, as well as physical problems, premature death, and suicide. At a societal level the costs are staggering. It has been estimated that the annual financial burden of each case of anxiety disorder is over $3,000 per year, meaning that the annual cost of anxiety disorders alone in the United States runs into the trillions of dollars (Konnopka, Leichsenring, Leibing, & König, 2009; Smit et al., 2006). [3]

The goal of this chapter is to review the techniques that are used to treat psychological disorder. Just as psychologists consider the causes of disorder in terms of the bio-psycho-social model of illness, treatment is also based on psychological, biological, and social approaches.

The *psychological approach* to reducing disorder involves providing help to individuals or families through psychological therapy, including psychoanalysis, humanistic-oriented therapy, cognitive-behavioral therapy (CBT), and other approaches.

The *biomedical approach to reducing disorder* is based on the use of medications to treat mental disorders such as schizophrenia, depression, and anxiety, as well as the employment of brain intervention techniques, including *electroconvulsive therapy (ECT)*, *transcranial magnetic stimulation (TMS)*, and *psychosurgery*.

The *social approach to reducing disorder* focuses on changing the social environment in which individuals live to reduce the underlying causes of disorder. These approaches include *group, couples, and family therapy*, as well as *community outreach programs*. The community approach is likely to be the most effective of the three approaches because it focuses not only on treatment, but also on prevention of disorders (World Health Organization, 2004).[4]

A clinician may focus on any or all of the three approaches to treatment, but in making a decision about which to use, he or she will always rely on his or her knowledge about existing empirical tests of the effectiveness of different treatments. These tests, known as *outcome studies*, carefully compare people who receive a given treatment with people who do not receive a treatment, or with people who receive a different type of treatment. Taken together, these studies have confirmed that many types of therapies are effective in treating disorder.

[1] Shim, J. (2008, January 29). Dogs chase nightmares of war away. *CNN*. Retrieved fromhttp://edition.cnn.com/2008/LIVING/personal/01/29/dogs.veterans; Lorber, J. (2010, April 3). For the battle-scarred, comfort at leash's end. *The New York Times*. Retrieved fromhttp://www.nytimes.com/2010/04/04/us/04dogs.html; Alaimo, C. A. (2010, April 11). Psychiatric service dogs use senses to aid owners. *Arizona Daily Star*. Retrieved fromhttp://azstarnet.com/news/local/article_d24b5799-9b31-548c-afec-c0160e45f49c.html; Schwartz, A. N. (2008, March 16). Psychiatric service dogs, very special dogs, indeed. *Dr. Schwartz's Weblog*. Retrieved from http://www.mentalhelp.net/poc/view_doc.php?type=doc&id=14844

The first step in seeking help for psychological problems is to accept the stigma. It is possible that some of your colleagues, friends, and family members will know that you are seeking help and some may at first think more negatively of you for it. But you must get past these unfair and close-minded responses. Feeling good about yourself is the most important thing you can do, and seeking help may be the first step in doing so.

One question is how to determine if someone needs help. This question is not always easy to answer because there is no clear demarcation between "normal" and "abnormal" behavior. Most generally, you will know that you or others need help when the person's psychological state is negatively influencing his or her everyday behavior, when the behavior is adversely affecting those around the person, and when the problems continue over a period of time. Often people seek therapy as a result of a life-changing event such as diagnosis of a fatal illness, an upcoming marriage or divorce, or the death of a loved one. But therapy is also effective for general depression and anxiety, as well as for specific everyday problems.

There are a wide variety of therapy choices, many of which are free. Begin in your school, community or church, asking about community health or counseling centers and pastoral counseling. You may want to *ask friends and family members for recommendations*. You'll probably be surprised at how many people have been to counseling, and how many recommend it.

There are many therapists who offer a variety of treatment options. Be sure to ask about the degrees that the therapist has earned, and about the reputation of the center in which the therapy occurs. If you have choices, try to find a person or location that you like, respect, and trust. This will allow you to be more open, and you will get more out of the experience. Your sessions with the help provider will require discussing your family history, personality, and relationships, and you should feel comfortable sharing this information.

Remember also that confronting issues requires time to reflect, energy to get to the appointments and deal with consequential feelings, and discipline to explore your issues on your own. Success at therapy is difficult, and it takes effort.

The bottom line is that going for therapy should not be a difficult decision for you. All people have the right to appropriate mental health care just as they have a right to general health care. Just as you go to a dentist for a toothache, you may go to therapy for psychological difficulties. Furthermore, you can be confident that you will be treated with respect and that your privacy will be protected, because therapists follow ethical principles in their

unconscious dynamics of personality. The analyst engages with the patient, usually in one-on-one sessions, often with the patient lying on a couch and facing away. The goal of the psychotherapy is for the patient to talk about his or her personal concerns and anxieties,*allowing the therapist to try to understand the underlying unconscious problems that are causing the symptoms* (the process of interpretation). The analyst may try out some interpretations on the patient and observe how he or she responds to them.

The patient may be asked to verbalize his or her thoughts throughfree association, in which the *therapist listens while the client talks about whatever comes to mind, without any censorship or filtering*. The client may also be asked to report on his or her dreams, and the therapist will usedream analysis to *analyze the symbolism of the dreams in an effort to probe the unconscious thoughts of the client and interpret their significance*. On the basis of the thoughts expressed by the patient, the analyst discovers the unconscious conflicts causing the patient's symptoms and interprets them for the patient.

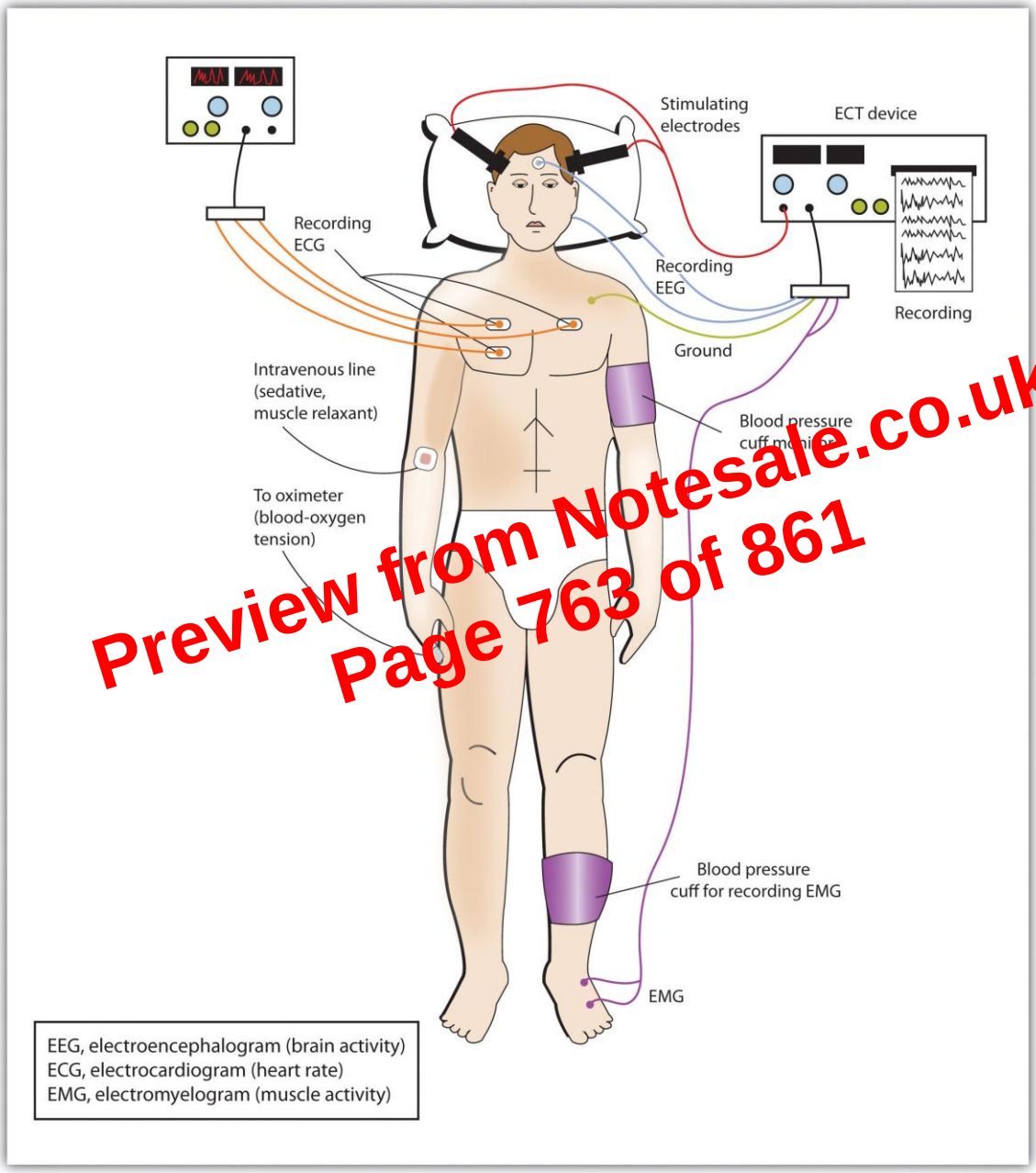
The goal of psychotherapy is to help the patient develop insight—that is, *an understanding of the unconscious causes of the disorder* (Epstein, Stern, & Silberswieg, 2001; Lubarsky & Barrett, 2006),[4] but the patient often showsresistance to these new understandings, *using defense mechanisms to avoid the painful feelings in his or her unconscious*. The patient might forget or miss appointments, or act out with hostile feelings toward the therapist. The therapist attempts to help the patient develop insight into the causes of the resistance. The sessions may also lead to transference, in which *the patient unconsciously redirects feelings experienced in an important personal relationship toward the therapist*. For instance, the patient may transfer feelings of guilt that come from the father or mother to the therapist. Some therapists believe that transference should be encouraged, as it allows the client to resolve hidden conflicts and work through feelings that are present in the relationships.

Important Characteristics and Experiences in Psychoanalysis

- **Free association.** The therapist listens while the client talks about whatever comes to mind, without any censorship or filtering. The therapist then tries to interpret these free associations, looking for unconscious causes of symptoms.

2001).[14] ECT may also cause short-term memory loss or cognitive impairment (Abrams, 1997; Sackheim et al., 2007).[15]

Figure 13.7 *Electroconvulsive Therapy (ECT)*



[5] Fraser, A. R. (2000). Antidepressant choice to minimize treatment resistance. *The British Journal of Psychiatry, 176*, 493; Hollon, S. D., Thase, M. E., & Markowitz, J. C. (2002). Treatment and prevention of depression. *Psychological Science in the Public Interest, 3*, 39–77.

[6] Healy, D., & Whitaker, C. J. (2003). Antidepressants and suicide: Risk-benefit conundrums. *Journal of Psychiatry & Neuroscience, 28*, 331–339; Simon, G. E. (2006). The antidepressant quandary—Considering suicide risk when treating adolescent depression.*The New England Journal of Medicine, 355*, 2722–2723; Simon, G. E., Savarino, J., Operskalski, B., & Wang, P. S. (2006). Suicide risk during antidepressant treatment.*American Journal of Psychiatry, 163*, 41–47. doi:10.1176/appi.ajp.163.1.41

[7] McElroy, S. L., & Keck, P. E. (2000). Pharmacologic agents for the treatment of acute bipolar mania. *Biological Psychiatry, 48*, 539–557.

[8] Kowatch, R. A., Suppes, T., Carmody, T. J., Bucci, J. P., Hume, J. H., Kromelis, M.,…Rush, A. J. (2000). Effect size of lithium, divalproex sodium, and carbamazepine in children and adolescents with bipolar disorder. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*, 713–20.

[9] Otto, M. W., Pollack, M. H., Sachs, G. S., Reiter, S. R., Meltzer-Brody, S., & Rosenbaum, J. F. (1993). Discontinuation of benzodiazepine treatment: Efficacy of cognitive-behavioral therapy for patients with panic disorder. *American Journal of Psychiatry, 150*, 1485–1490.

[10] Marangell, L. B., Silver, J. M., Goff, D. C., & Yudofsky, S. C. (2003). Psychopharmacology and electroconvulsive therapy. In R. E. Hales & S. C. Yudofsky (Eds.), *The American Psychiatric Publishing textbook of clinical psychiatry* (4th ed., pp. 1047–1149). Arlington, VA: American Psychiatric Publishing.

[11] National Institute of Mental Health. (2008). *Mental health medications* (NIH Publication No. 08-3929). Retrieved fromhttp://www.nimh.nih.gov/health/publications/mental-health-medications/complete-index.shtml#pub4

[12] Casey, D. E. (1996). Side effect profiles of new antipsychotic agents. *Journal of Clinical Psychiatry, 57*(Suppl. 11), 40–45.

[13] Kellner, C. H., Fink, M., Knapp, R., Petrides, G., Husain, M., Rummans, T.,…Malur, C. (2005). Relief of expressed suicidal intent by ECT: A consortium for research in ECT study.*The American Journal of Psychiatry, 162*(5), 977–982.

[14] Sackheim, H. A., Haskett, R. F., Mulsant, B. H., Thase, M. E., Mann, J. J., Pettinati, H.,…Prudic, J. (2001). Continuation pharmacotherapy in the prevention of relapse following electroconvulsive therapy: A randomized controlled trial. *Journal of the American Medical Association, 285*, 1299–1307.

[18] Louik, C., Lin, A. E., Werler M. M., Hernandez, S., & Mitchell, A. A. (2007). First-trimester use of selective serotonin-reuptake inhibitors and the risk of birth defects. *New England Journal of Medicine, 356*, 2675–2683; U.S. Food and Drug Administration. (2004). FDA Medwatch drug alert on Effexor and SSRIs. Retrieved fromhttp://www.fda.gov/medwatch/safety/2004/safety04.htm#effexor

[19] Diav-Citrin, O., Shechtman, S., Ornoy, S., Arnon, J., Schaefer, C., Garbis, H.,…Ornoy, A. (2005). Safety of haloperidol and penfluridol in pregnancy: A multicenter, prospective, controlled study. *Journal of Clinical Psychiatry, 66*, 317–322.

[20] Price, R. H., Cowen, E. L., Lorion, R. P., & Ramos-McKay, J. (Eds.). (1988). *Fourteen ounces of prevention: A casebook for practitioners*. Washington, DC: American Psychological Association.

[21] Ripple, C. H., & Zigler, E. (2003). Research, policy, and the federal role in prevention initiatives for children. *American Psychologist, 58*(6–7), 482–490.

[22] Centers for Disease Control and Prevention. (2000). Blood lead levels in young children: United States and selected states, 1996–1999. *Morbidity and Mortality Weekly Report, 49*, 1133–1137.

[23] Wandersman, A., & Florin, P. (2003). Community interventions and effective prevention. *American Psychologist, 58*(6–7), 441–448; Wilson, D. B., Gottfredson, D. C., & Najaka, S. S. (2001). School-based prevention of problem behaviors: A meta-analysis.*Journal of Quantitative Criminology, 17*(3), 247–272.

[24] Weissberg, R. P., Kumpfer, K. L., & Seligman, M. E. P. (2003). Prevention that works for children and youth: An introduction. *American Psychologist, 58*(6–7), 425–432.

13.5 Chapter Summary

Psychological disorders create a tremendous individual, social, and economic drain on society. Psychologists work to reduce this burden by preventing and treating disorder. Psychologists base this treatment and prevention of disorder on the bio-psycho-social model, which proposes that disorder has biological, psychological, and social causes, and that each of these aspects can be the focus of reducing disorder.

Variable	Pearson Correlation Coefficient (*r*)
Warm	0.67
Overall, across all traits	0.76

This table shows the Pearson correlation coefficients between the impressions that a group of students made after they had seen a video of instructors teaching for only 30 seconds and the teaching ratings of the same instructors made by students who had spent a whole semester in the class. You can see that the correlations are all positive, and that many of them are quite large. The conclusion is that people are sometimes able to draw accurate impressions about other people very quickly.

Source: Ambady, N., & Rosenthal, R. (1993). Half a minute: Predicting teacher evaluations from thin slices of nonverbal behavior and physical attractiveness. *Journal of Personality & Social Psychology, 64*(3), 431–441.

If the finding that judgments made about people in 30 seconds correlate highly with judgments made about the same people after a whole semester surprises you, then perhaps you may be even more surprised to hear that we do not even need that much time. Indeed, Willis and Todorov (2006)[23] found that even a tenth of a second was enough to make judgments that correlated highly with those same judgments made by other people who were given several minutes to make the judgments. Other research has found that we can make accurate judgments, for instance, about our perceptions of salespersons (Ambady, Krabbenhoft, & Hogan, 2006)[24] and about the sexual orientation of other people (Ambady, Hallahan, & Conner, 1999),[25] in just a few seconds. Todorov, Mandisodza, Goren, and Hall (2005)[26] found that people voted for political candidates in large part on the basis of whether or not their faces, seen only for one second, looked like faces of competent people. Taken together, this research shows that we are well able to form initial impressions of others quickly and often quite accurately.

Close Relationships

One of the most important tasks faced by humans is to develop successful relationships with others. These relationships include acquaintanceships and friendships but also the more important close relationships, which are *the long-term intimate and romantic relationships that we develop with another person—for instance, in a marriage* (Hendrick & Hendrick, 2000).[27]Because most of us will want to enter into a close relationship at some point, and because close relationships are evolutionarily important as they form the basis for effective child

Making causal attributions is a bit like conducting an experiment. We carefully observe the people we are interested in and note how they behave in different social situations. After we have made our observations, we draw our conclusions. Sometimes we may decide that the behavior was caused primarily by the person; this is called making a *person attribution*. At other times, we may determine that the behavior was caused primarily by the situation; this is called making a *situation attribution.* And at other times we may decide that the behavior was caused by both the person and the situation.

It is easier to make personal attributions when behavior is more unusual or unexpected. Imagine that you go to a party and you are introduced to Tess. Tess shakes your hand and says "Nice to meet you!" Can you readily conclude, on the basis of this behavior, that Tess is a friendly person? Probably not. Because the social situation demands that people act in a friendly way (shaking your hand and saying "nice to meet you"), it is difficult to know whether Tess acted friendly because of the situation or because she is really friendly. Imagine, however, that instead of shaking your hand, Tess sticks out her tongue at you and walks away. I think you would agree that it is easier in this case to infer that Tess is unfriendly because her behavior is so contrary to what one would expect (Jones, Davis, & Gergen, 1961). [47]

Although people are reasonably accurate in their attributions (we could say, perhaps, that they are "good enough"; Fiske, 2003), [48] they are far from perfect. One error that we frequently make when making judgments about ourselves is to make *self-serving attributions* by judging the causes of our own behaviors in overly positive ways. If you did well on a test, you will probably attribute that success to person causes ("I'm smart," "I studied really hard"), but if you do poorly on the test you are more likely to make situation attributions ("The test was hard," "I had bad luck"). Although making causal attributions is expected to be logical and scientific, our emotions are not irrelevant.

Another way that our attributions are often inaccurate is that we are, by and large, too quick to attribute the behavior of other people to something personal about them rather than to something about their situation. We are more likely to say, "Leslie left a big tip, so she must be generous"

The problem here is that Magritte's attitude is being expressed in one social situation (when she is with her parents) whereas the behavior (trying a cigarette) is going to occur in a very different social situation (when she is out with her friends). The relevant social norms are, of course, much different in the two situations. Magritte's friends might be able to convince her to try smoking, despite her initial negative attitude, by enticing her with peer pressure. Behaviors are more likely to be consistent with attitudes when the social situation in which the behavior occurs is similar to the situation in which the attitude is expressed (Ajzen, 1991).[57]

Although it might not have surprised you to hear that our attitudes predict our behaviors, you might be more surprised to learn that our behaviors also have an influence on our attitudes. It makes sense that if I like Frosted Flakes I'll buy them, because my positive attitude toward the product influences my behavior. But my attitudes toward Frosted Flakes may also become more positive if I decide—for whatever reason—to buy some. It makes sense that Charlie's love for Charlene will lead him to propose marriage, but it is also the case that he will likely love Charlene even more after he does so.

Behaviors influence attitudes in part through the process of *self-perception*. Self-perception occurs *when we use our own behavior as a guide to help us determine our own thoughts and feelings* (Bem, 1972; Olson & Stone, 2005).[58] In one demonstration of the power of self-perception, Wells and Petty (1980)[59] assigned their research participants to shake their heads either up and down or side to side as they read newspaper editorials. The participants who had shaken their heads up and down later agreed with the content of the editorials more than the people who had shaken them side to side. Wells and Petty argued that this occurred because the participants used their own head-shaking behaviors to determine their attitudes about the editorials.

Persuaders may use the principles of self-perception to change attitudes. The *foot-in-the-door technique* is a method of persuasion in which the person is first persuaded to accept a rather minor request and then asked for a larger one after that. In one demonstration, Guéguen and Jacob (2002)[60] found that students in a computer discussion group were more likely to

- Causal attribution is the process of trying to determine the causes of people's behavior with the goal of learning about their personalities. Although people are reasonably accurate in their attributions, they also succumb to biases such as the fundamental attribution error.
- Attitudes refer to our relatively enduring evaluations of people and things. Attitudes are determined in part by genetic transmission from our parents and in part through direct and indirect experiences.
- Although attitudes predict behaviors, behaviors also predict attitudes. This occurs through the processes of self-perception and cognitive dissonance.

EXERCISES AND CRITICAL THINKING

1. What kinds of people are you attracted to? Do your preferences match the factors that we have just discussed?
2. What stereotypes and prejudices do you hold? Are you able to get past them and judge people as individuals? Do you think that your stereotypes influence your behavior without your being aware of them?
3. Consider a time when your behavior influenced your attitudes. Did this occur as a result of self-perception or cognitive dissonance?

[1] Schneider, D. J. (2004). *The psychology of stereotyping*. New York, NY: Guilford Press; Zebrowitz, L. A., & Montepare, J. (2006). The ecological approach to person perception: Evolutionary roots and contemporary offshoots. In M. Schaller, J. A. Simpson, & D. T. Kenrick (Eds.), *Evolution and social psychology* (pp. 81–113). Madison, CT: Psychosocial Press.

[2] Walster, E., Aronson, V., Abrahams, D., & Rottmann, L. (1966). Importance of physical attractiveness in dating behavior. *Journal of Personality and Social Psychology, 4*(5), 508–516.

[3] Langlois, J. H., Ritter, J. M., Roggman, L. A., & Vaughn, L. S. (1991). Facial diversity and infant preferences for attractive faces. *Developmental Psychology, 27*(1), 79–84.

[4] Zebrowitz, L. A., Fellous, J.-M., Mignault, A., & Andreoletti, C. (2003). Trait impressions as overgeneralized responses to adaptively significant facial qualities: Evidence from connectionist modeling. *Personality and Social Psychology Review, 7*(3), 194–215.

[5] Zebrowitz, L. A. (1996). Physical appearance as a basis of stereotyping. In C. N. Macrae, C. Stangor, & M. Hewstone (Eds.), *Stereotypes and stereotyping* (pp. 79–120). New York, NY: Guilford Press; Zebrowitz, L. A., Luevano, V. X., Bronstad, P. M., & Aharon, I. (2009). Neural activation to babyfaced men matches activation to babies. *Social Neuroscience, 4*(1), 1–10.

[32] Brooks-Gunn, J., & Lewis, M. (1981). Infant social perception: Responses to pictures of parents and strangers. *Developmental Psychology, 17*(5), 647–649.

[33] Mita, T. H., Dermer, M., & Knight, J. (1977). Reversed facial images and the mere-exposure hypothesis. *Journal of Personality & Social Psychology, 35*(8), 597–601.

[34] Freitas, A. L., Azizian, A., Travers, S., & Berry, S. A. (2005). The evaluative connotation of processing fluency: Inherently positive or moderated by motivational context? *Journal of Experimental Social Psychology, 41*(6), 636–644.

[35] Harmon-Jones, E., & Allen, J. J. B. (2001). The role of affect in the mere exposure effect: Evidence from psychophysiological and individual differences approaches. *Personality & Social Psychology Bulletin, 27*(7), 889–898.

[36] Zebrowitz, L. A., Bronstad, P. M., & Lee, H. K. (2007). The contribution of face familiarity to ingroup favoritism and stereotyping. *Social Cognition, 25*(2), 306–338.

[37] Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality & Social Psychology, 63*(4), 596–612.

[38] Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality & Social Psychology, 60*, 241–253; Aron, A., Paris, M., & Aron, E. N. (1995). Falling in love: Prospective studies of self-concept change. *Journal of Personality & Social Psychology, 69*(6), 1102–1112.

[39] Reis, H. T., & Aron, A. (2008). Love: What is it, why does it matter, and how does it operate? *Perspectives on Psychological Science, 3*(2), 80–86.

[40] Berscheid, E., & Reis, H. T. (1998). Attraction and close relationships. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vols. 1–2, pp. 193–281). New York, NY: McGraw-Hill.

[41] Rusbult, C. E., Olsen, N., Davis, J. L., & Hannon, P. A. (2001). Commitment and relationship maintenance mechanisms. In J. Harvey & A. Wenzel (Eds.), *Close romantic relationships: Maintenance and enhancement* (pp. 87–113). Mahwah, NJ: Lawrence Erlbaum Associates.

[42] Clark, M. S., & Mills, J. (2004). Interpersonal attraction in exchange and communal relationships. In H. T. Reis & C. E. Rusbult (Eds.), *Close relationships: Key readings* (pp. 245–256). Philadelphia, PA: Taylor & Francis.

[43] Simpson, J. A., & Harris, B. A. (1994). Interpersonal attraction. In A. L. Weber & J. H. Harvey (Eds.), *Perspectives on close relationships* (pp. 45–66). Boston, MA: Allyn & Bacon.

can increase helping, modeling of behavior that is not altruistic can decrease altruism. For instance, Anderson and Bushman (2001)[8] found that playing violent video games led to a decrease in helping.

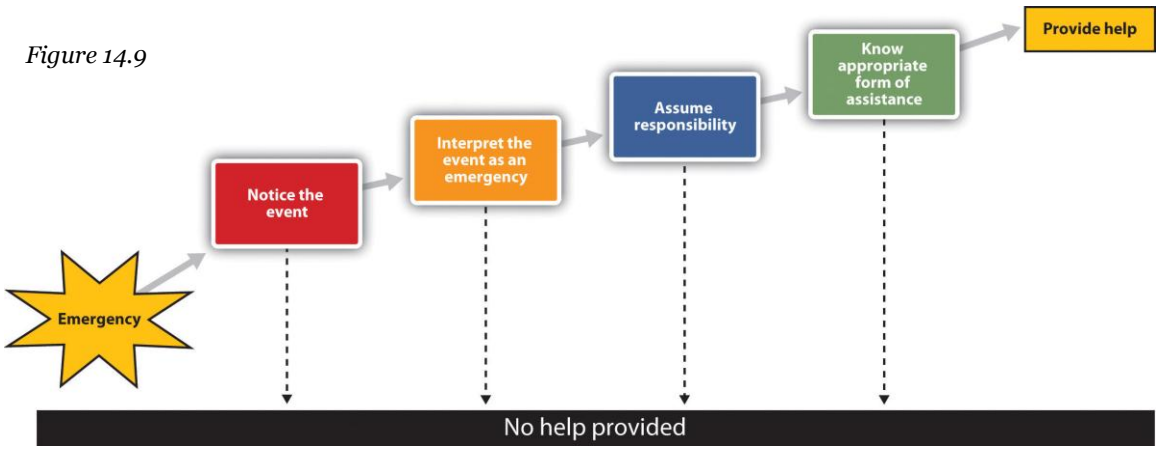
We are more likely to help when we receive rewards for doing so and less likely to help when helping is costly. Parents praise their children who share their toys with others, and may reprimand children who are selfish. We are more likely to help when we have plenty of time than when we are in a hurry (Darley and Batson 1973).[9] Another potential reward is the status we gain as a result of helping. When we act altruistically, we gain a reputation as a person with high status who is able and willing to help others, and this status makes us more desirable in the eyes of others (Hardy & Van Vugt, 2006).[10]

The outcome of the reinforcement and modeling of altruism is the development of social norms about helping—standards of behavior that we see as appropriate and desirable regarding helping. The *reciprocity norm* reminds us that we should follow the principles of reciprocal altruism. If someone helps us, then we should help them in the future, and we should help people now with the expectation that they will help us later if we need it. The reciprocity norm is found in everyday adages such as "Scratch my back and I'll scratch yours" and in religious and philosophical teachings such as the "Golden Rule": "Do unto other as you would have them do unto you."

Because helping based on the reciprocity norm is based on the return of earlier help and the expectation of a future return from others, it might not seem like true altruism. We might hope that our children internalize another relevant social norm that seems more altruistic: the *social responsibility norm.* The social responsibility norm tells us that we should try to help others who need assistance, even without any expectation of future paybacks. The teachings of many religions are based on the social responsibility norm; that we should, as good human beings, reach out and help other people whenever we can.

How the Presence of Others Can Reduce Helping

Figure 14.9



The Latané and Darley model of helping is based on the idea that a variety of situational factors can influence whether or not we help.

The first step in the model is noticing the event. Latané and Darley (1968)[12] demonstrated the important role of the social situation in noticing by asking research participants to complete a questionnaire in a small room. Some of the participants completed the questionnaire alone, whereas others completed the questionnaire in small groups in which two other participants were also working on questionnaires. A few minutes after the participants had begun the questionnaires, the experimenters started to let some white smoke come into the room through a vent in the wall. The experimenters timed how long it took before the first person in the room looked up and noticed the smoke.

The people who were working alone noticed the smoke in about 5 seconds, and within 4 minutes most of the participants who were working alone had taken some action. On the other hand, on average, the first person in the group conditions did not notice the smoke until over 20 seconds had elapsed. And, although 75% of the participants who were working alone reported the smoke within 4 minutes, the smoke was reported in only 12% of the groups by that time. In fact, in only 3 of the 8 groups did anyone report the smoke, even after it had filled the room. You can see that the social situation has a powerful influence on noticing; we simply don‘t see emergencies when other people are with us.

Human Aggression: An Adaptive yet Potentially Damaging Behavior

Aggression is *behavior that is intended to harm another individual.* Aggression may occur in the heat of the moment, for instance, when a jealous lover strikes out in rage or the sports fans at a university light fires and destroy cars after an important basketball game. Or it may occur in a more cognitive, deliberate, and planned way, such as the aggression of a bully who steals another child's toys, a terrorist who kills civilians to gain political exposure, or a hired assassin who kills for money.

Not all aggression is physical. Aggression also occurs in nonphysical ways, as when children exclude others from activities, call them names, or spread rumors about them. Paquette and Underwood (1999)[14] found that both boys and girls rated nonphysical aggression such as name-calling as making them feel more "sad and bad" than did physical aggression.

The Ability to Aggress Is Part of Human Nature

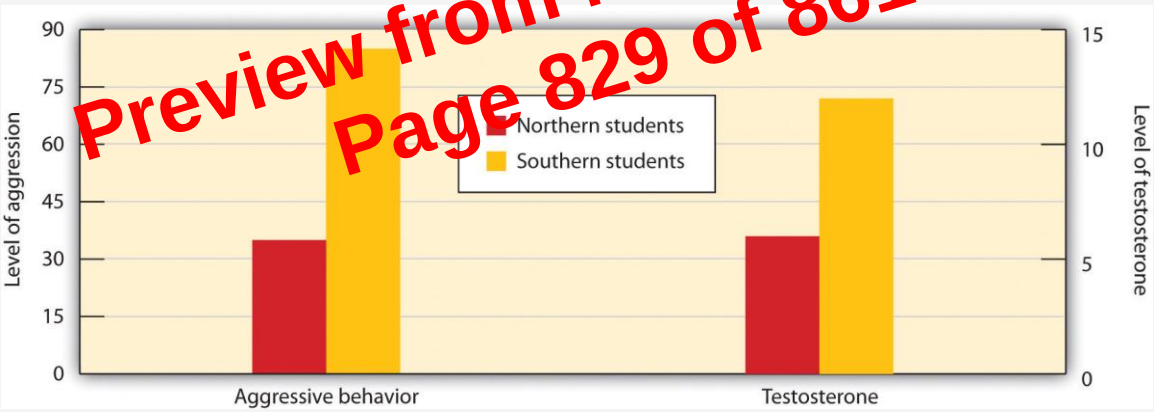
We may aggress against others in part because it allows us to gain access to valuable resources such as food, territory, and desirable mates, or to protect ourselves from direct attack by others. If aggression helps in the survival of our genes, then the process of natural selection may well have caused humans, as it would any other animal, to be aggressive (Buss & Duntley, 2006).[15]

There is evidence for the genetics of aggression. Aggression is controlled in large part by the amygdala. One of the primary functions of the amygdala is to help us learn to associate stimuli with the rewards and the punishment that they may provide. The amygdala is particularly activated in our responses to stimuli that we see as threatening and fear-arousing. When the amygdala is stimulated, in either humans or in animals, the organism becomes more aggressive.

But just because we *can* aggress does not mean that we *will* aggress. It is not necessarily evolutionarily adaptive to aggress in all situations. Neither people nor animals are always aggressive; they rely on aggression only when they feel that they absolutely need to (Berkowitz,

confederate who did not give way to the participant but rather bumped into him and insulted him. Compared with Northerners, students from the South who had been bumped were more likely to think that their masculine reputations had been threatened, exhibited greater physiological signs of being upset, had higher testosterone levels, engaged in more aggressive and dominant behavior (gave firmer handshakes), and were less willing to yield to a subsequent confederate (Figure 14.10 "Results From Cohen, Nisbett, Bosdle, and Schwarz, 1996").

Figure 14.10Results From Cohen, Nisbett, Bosdle, and Schwarz, 1996



Students from southern U.S. states expressed more anger and had greater levels of testosterone after being insulted than did students from northern states.

Source: Adapted from Cohen, D., Nisbett, R. E., Bosdle, B., & Schwarz, N. (1996). Insult, aggression, and the southern culture of honor: An "experimental ethnography." Journal of Personality and Social Psychology, 70, 945–960.

In another test of the impact of culture of honor, Cohen and Nisbett (1997)[34] sent letters to employers across the United States from a fictitious job applicant who admitted having been convicted of a felony. To half the employers, the applicant reported that he had impulsively killed a man who had been having an affair with his fiancée and then taunted him about it in a crowded bar. To the other half, the applicant reported that he had stolen a car because he needed the money to pay off debts. Employers from the South and the West, places in which the culture of honor is strong, were more likely than employers in the North and East to respond in an understanding and cooperative way to the letter from the convicted killer, but there were no cultural differences for the letter from the auto thief.

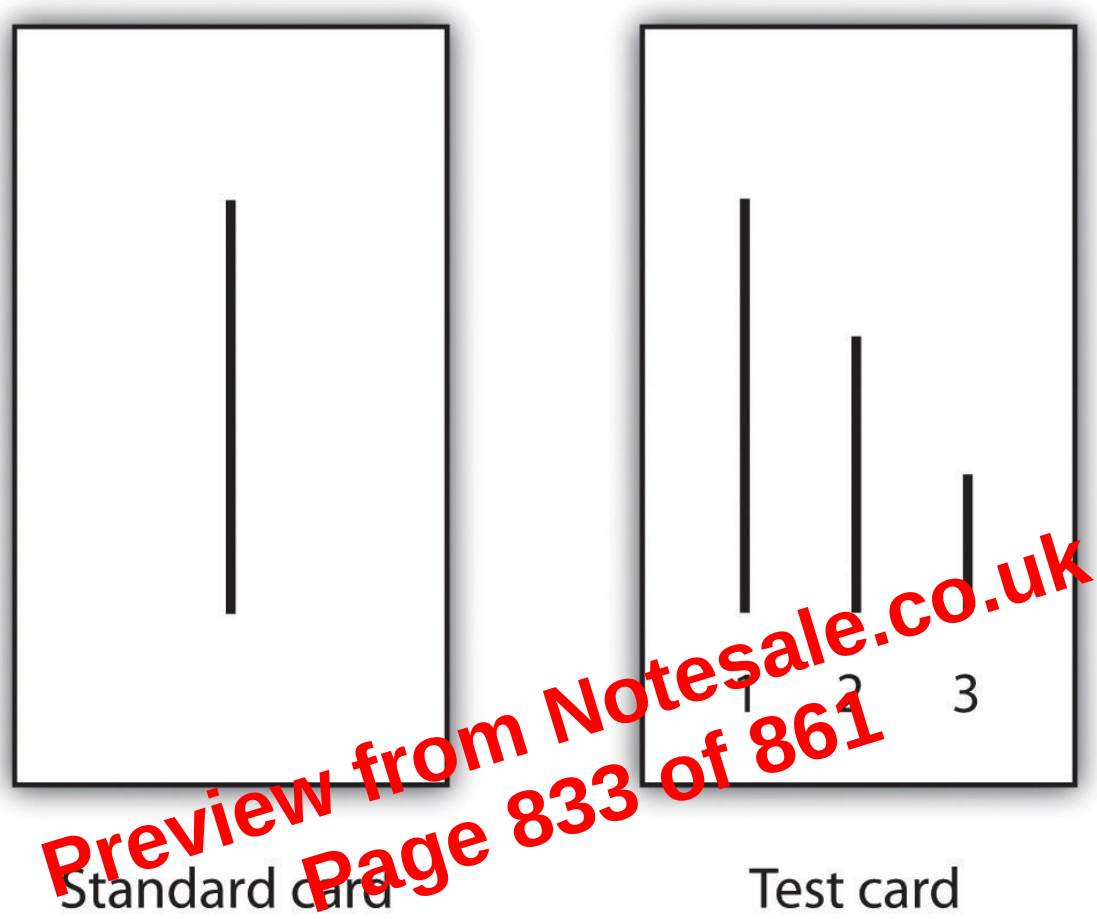
One possible explanation for regional differences in the culture of honor involves the kind of activities typically engaged in by men in the different regions. While people in the northern parts of the United States were usually farmers who grew crops, people from southern climates were more likely to raise livestock. Unlike the crops grown by the northerners, the herds were mobile and vulnerable to theft, and it was difficult for law enforcement officials to protect them. To be successful in an environment where theft was common, a man had to build a reputation for strength and toughness, and this was accomplished by a willingness to use swift, and sometimes violent, punishment against thieves.

Conformity and Obedience: How Social Influence Creates Social Norms

When we decide on what courses to enroll in by asking for advice from our friends, change our beliefs or behaviors as a result of the ideas that we hear from others, or binge drink because our friends are doing it, we are engaging in conformity, *a change in beliefs or behavior that occurs as the result of the presence of the other people around us.* We conform not only because we believe that other people have accurate information and we want to have knowledge (*informational conformity*) but also because we want to be liked by others (*normative conformity*).

The typical outcome of conformity is that our beliefs and behaviors become more similar to those of others around us. But some situations create more conformity than others, and some of the factors that contribute to conformity are shown in Table 14.4 "Variables That Increase Conformity".

Figure 14.12



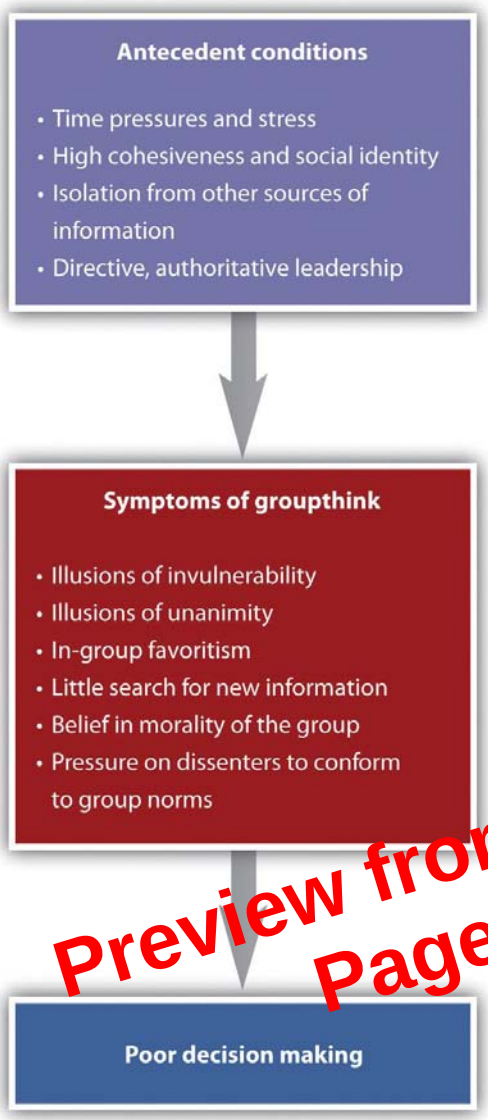
On each trial, each person in the group answered out loud, beginning with one end of the group and moving toward the other end. Although the real research participant did not know it, the other group members were actually not participants but experimental confederates who gave predetermined answers on each trial. Because the real participant was seated next to last in the row, he always made his judgment following most of the other group members. Although on the first two trials the confederates each gave the correct answer, on the third trial, and on 11 of the subsequent trials, they all had been instructed to give the same wrong choice. For instance, even though the correct answer was Line 1, they would all say it was Line 2. Thus when it became the

increase performance on many types of tasks, including jogging, shooting pool, lifting weights, and solving problems (Bond & Titus, 1983).[2] *The tendency to perform tasks better or faster in the presence of others* is known as social facilitation.

However, although people sometimes perform better when they are in groups than they do alone, the situation is not that simple. Perhaps you remember an experience when you performed a task (playing the piano, shooting basketball free throws, giving a public presentation) very well alone but poorly with, or in front of, others. Thus it seems that the conclusion that being with others increases performance cannot be entirely true. *The tendency to perform tasks more poorly or more slowly in the presence of others* is known as social inhibition.

Robert Zajonc (1965)[3] explained the observed influence of others on task performance using the concept of physiological arousal. According to Zajonc, when we are with others we experience more arousal than we do when we are alone, and this arousal increases the likelihood that we will perform the *dominant response*, the action that we are most likely to emit in any given situation (Figure 14.15 "Drive-Arousal Model of Social Facilitation").

Figure 14.17 *Causes and Outcomes of Groupthink*



It has been suggested that groupthink was involved in a number of well-known and important, but very poor, decisions made by government and business groups, including the decision to invade Iraq made by President Bush and his advisors in 2002, the crashes of two Space Shuttle missions in 1986 and 2003, and the decision of President John Kennedy and his advisors to commit U.S. forces to help invade Cuba and overthrow Fidel Castro in 1962. Analyses of the decision-making processes in these cases have documented the role of conformity pressures.

[1] Triplett, N. (1898). The dynamogenic factors in pacemaking and competition.*American Journal of Psychology, 9*(4), 507–533.

[2] Bond, C. F., & Titus, L. J. (1983). Social facilitation: A meta-analysis of 241 studies. *Psychological Bulletin, 94*(2), 265–292.

[3] Zajonc, R. B. (1965). Social facilitation. *Science, 149*, 269–274.

[4] Bond, C. F., & Titus, L. J. (1983). Social facilitation: A meta-analysis of 241 studies. *Psychological Bulletin, 94*(2), 265–292.

[5] Baron, R. (1986). Distraction/conflict theory: Progress and problems. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19). New York, NY: Academic Press.

[6] Strube, M. J., Miles, M. E., & Finch, W. H. (1981). The social facilitation of a simple task: Field tests of alternative explanations. *Personality & Social Psychology Bulletin, 7*(4), 701–707.

[7] Kravitz, D. A., & Martin, B. (1986). Ringelmann rediscovered: The original article. *Journal of Personality and Social Psychology, 50*, 936–941.

[8] Baron, R. S. (2005). So right it's wrong: Groupthink and the ubiquitous nature of polarized group decision making. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 37, pp. 219–253). San Diego, CA: Elsevier Academic Press; Janis, I. L. (2007). Groupthink. In R. P. Vecchio (Ed.), *Leadership: Understanding the dynamics of power and influence in organizations* (2nd ed., pp. 157–169). Notre Dame, IN: University of Notre Dame Press.

[9] Stasser, G., Kerr, N. L., & Bray, R. M. (1982). The social psychology of jury deliberations: Structure, process and product. In N. L. Kerr & R. M. Bray (Eds.), *The psychology of the courtroom* (pp. 221–256). New York, NY: Academic Press.

[10] Davis, J. H., Stasson, M. F., Ono, K., & Zimmerman, S. (1988). Effects of straw polls on group decision making: Sequential voting pattern, timing, and local majorities. *Journal of Personality & Social Psychology, 55*(6), 918–926.

[11] Nijstad, B. A., Stroebe, W., & Lodewijkx, H. F. M. (2006). The illusion of group productivity: A reduction of failures explanation. *European Journal of Social Psychology, 36*(1), 31–48; Stroebe, W., Diehl, M., & Abakoumkin, G. (1992). The illusion of group effectivity. *Personality & Social Psychology Bulletin, 18*(5), 643–650.

14.4 Chapter Summary

Social psychology is the scientific study of how we feel about, think about, and behave toward the other people around us, and how those people influence our thoughts, feelings, and behavior. A fundamental principle of social psychology is that although we may not always be aware of it,

9.00SC Introduction to Psychology
Fall 2011