Emotions are psychological responses that involve an interplay among (1) physiological arousal, (2) expressive behavior, and (3) conscious experience.

James and Lange argued that we feel emotion after we notice our bodily responses. Cannon and Bard contended that we feel emotion when our body responds. Schachter and Singer’s two-factor theory states that to experience emotion, we must be aroused and cognitively label the emotion.

Some emotional responses are immediate, as sensory input bypasses the cortex, triggering a rapid reaction outside our conscious awareness. Others, especially responses to complex emotions, require interpretation.

Although the physical arousal that occurs with the different emotions is for the most part indistinguishable, researchers have discovered subtle differences in brain circuits, finger temperatures, and hormones. In using physiological indicators to detect lies, the polygraph does better than chance but not nearly well enough to justify its widespread use.

We decipher people’s emotions by “reading” their bodies, voices, and faces. Although some gestures are culturally determined, facial expressions, such as those of happiness and fear, are universal. Facial expressions not only communicate emotion but also amplify the felt emotion.

Carroll Izard has identified 10 basic emotions, most of which are present in infancy. This chapter examines two human emotions in detail: anger and happiness. Anger is most often aroused by frustrating or insulting acts that seem willful, unjustified, and avoidable. Expressing anger may be temporarily calming, but in the long run, it can actually arouse more anger. Happiness boosts people’s perceptions of the world and their willingness to help others. However, even significant good events seldom increase happiness for long, a fact explained by the adaptation-level and relative deprivation principles.

Exposure to prolonged stress can increase our susceptibility to serious illness. Health psychology provides psychology’s contribution to behavioral medicine. Walter Cannon viewed our response to stress as a fight-or-flight system. Hans Selye saw it as a three-stage general adaptation syndrome. Modern research assesses the health consequences of various life experiences. Stress may affect the progression of several serious illnesses, including AIDS and cancer. Coronary heart disease has been linked with the anger-prone Type A personality.

Several factors affect our ability to cope with stress, including our feelings of personal control, our basic outlook on life, and our supportive connections. Stress management programs include training in aerobic exercise, meditation, and relaxation. Researchers seek to identify “intervening variables” that may link spirituality and health.
**Fact or Falsehood?**

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<th>1. Some emotional responses involve no conscious thinking.</th>
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<td>2. The polygraph has proved to be extremely effective in detecting lies.</td>
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<td>3. Introverts are superior to extraverts at reading others’ emotions.</td>
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<td>4. Facial expressions associated with emotions such as happiness and fear are the same the world over.</td>
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<td>5. Occasionally blowing off steam seems to reduce anger and aggression in the long run.</td>
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<td>6. Kidney dialysis patients report being just as happy as healthy nonpatients.</td>
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<td>7. Compared with others, pessimists are more than twice as likely to develop heart disease.</td>
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<td>8. Researchers agree that stress creates cancer cells.</td>
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<td>9. Only 1 in 4 people in the United States exercise for at least a half-hour on five or more days of the week.</td>
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<td>10. Religious faith and health show a strong positive correlation.</td>
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Guide

Objectives

Every question in the Test Banks is keyed to one of these objectives.

Introduction to Emotion

12-1. Describe how arousal, cognition, and expressive behavior interact in emotion.
12-2. Explain whether we must consciously interpret and label emotions in order to experience them.
12-3. Describe the link between emotional arousal and the autonomic nervous system, and explain how arousal affects performance.
12-4. Discuss whether different emotions activate different physiological and brain-pattern responses.
12-5. Discuss the effectiveness of polygraphs in using body states to detect lies.

Expressing Emotion

12-6. Describe how we communicate nonverbally.
12-7. Discuss whether the genders differ in their ability to communicate nonverbally.
12-8. Explain whether gestures and facial expressions mean the same thing in all cultures.
12-9. Describe whether facial expressions influence our feelings.

Experiencing Emotion

12-10. Name some basic emotions, and describe two dimensions that help to differentiate them.
12-11. Identity the causes and consequences of anger.
12-12. Define the feel-good, do-good phenomenon, and describe the focus of positive psychology research.
12-13. Describe how time, wealth, adaptation, and comparison affect our happiness levels.

Stress and Illness

12-15. Identity events that provoke stress responses, and describe how we respond and adapt to stress.
12-16. Describe how stress makes us more vulnerable to disease.
12-17. Explain why some of us are more prone than others to coronary heart disease.

Health and Coping

12-18. Identify two ways that people try to alleviate stress.
12-19. Explain how a perceived lack of control can affect health.
12-20. Describe how our self-control can be depleted, and explain why it is important to build this strength.
12-22. Describe how social support promotes good health.
12-23. Discuss the effectiveness of aerobic exercise as a way to manage stress and improve well-being.
12-24. Describe the ways in which relaxation and meditation might influence stress and health.
12-25. Describe the faith factor, and offer some possible explanations for the link between faith and health.
**Introductory Exercise: Fact or Falsehood?**


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**Introduction to Emotion**

- Exercise: Need for Affect Scale
- Video: *This Emotional Life*
- LaunchPad: *What Is Emotion?*

**Emotion: Arousal, Behavior, and Cognition**

- Exercises: A Process Model of Emotion Regulation; Cognitive Labels for Emotions; Which Emotion Theory Says What?
- LaunchPad: *Emotion = Arousal Plus Interpretation*

12-1. Describe how arousal, cognition, and expressive behavior interact in emotion.

An emotion is a response of the whole organism that involves an interplay among (1) bodily arousal, (2) expressive behaviors, and (3) conscious experience.

The James-Lange theory states that our experience of an emotion is a consequence of our physiological response to a stimulus; we are afraid because our heart pounds (say, in response to an approaching stranger). The Cannon-Bard theory, on the other hand, proposes that the physiological response and our emotional experience occur simultaneously. Heart pounding and fear occur at the same time—one does not cause the other.

12-2. Explain whether we must consciously interpret and label emotions in order to experience them.

Schachter and Singer’s two-factor theory of emotion focuses on the interplay of thinking and feeling, not on the timing of feelings. This theory states that to experience emotion, one must (1) be physically aroused and (2) cognitively label the arousal.

The spillover effect occurs when arousal from one event affects our response to other events. Dozens of experiments show that a stirred-up state can be experienced as different emotions depending on how we interpret and label it. Arousal fuels emotion and cognition channels it.

Sometimes we experience unlabeled emotion. According to Zajonc and LeDoux, sensory input can follow a pathway that leads via the thalamus to the amygdala (the “low road”), bypassing the cortex and triggering a rapid reaction that is outside our conscious awareness. Other, more complex emotions, including hatred and love, require interpretation and are routed along the slower route (the “high road”) to the cortex for analysis. Automatic emotion and the importance of conscious thinking in emotion illustrate our two-track minds. Lazarus notes that cognitive appraisal always occurs, sometimes without our awareness.

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**Embodied Emotion**

- Exercise: Sensation-Seeking

12-3. Describe the link between emotional arousal and the autonomic nervous system, and explain how arousal affects performance.

The autonomic nervous system (ANS) controls arousal. In an emergency, the sympathetic division automatically mobilizes the body for fight or flight, directing the adrenal glands to release hormones that increase heart rate, blood pressure, and blood sugar level. Other physical changes include dilated pupils, slowed digestion, and increased sweating. The parasympathetic division calms the body after a crisis has passed, although arousal diminishes gradually.

According to the Yerkes-Dodson law, arousal affects performance in different ways, depending on the task, with moderate arousal leading to optimal performance. For example, when taking an exam, moderate arousal is best. In general, too little arousal can be disruptive; too much can tax the body.
12-4. Discuss whether different emotions activate different physiological and brain-pattern responses.

Similar physiological arousal occurs during fear, anger, and sexual arousal. Nonetheless, these emotions feel different. And, despite similar arousal, sometimes our facial expressions differ during these three states. For example, people may appear “paralyzed” with fear or “ready to explode” with anger.

Emotions may also stimulate different facial muscles. During fear, brow muscles tense. During joy, muscles in the cheek and under the eye pull into a smile. Emotions also differ in the brain circuits they use. For example, brain scans show increased activity in the amygdala during fear. Finally, emotions activate different areas of the brain’s cortex. The right prefrontal cortex becomes more electrically active as people experience negative emotions, such as disgust. The left frontal lobe shows more activity with positive emotions.

12-5. Discuss the effectiveness of polygraphs in using body states to detect lies.

The polygraph measures several physiological indicators of emotion—for example, changes in breathing, cardiovascular activity, and perspiration. Research suggests that if polygraph experts were the judges, more than one-third of the innocent would be declared guilty and one-quarter of the guilty would be declared innocent, percentages that are too high to justify its widespread use in business and government. A more effective approach is the guilty knowledge test. Several research teams are exploring new ways to detect deception. For example, “forensic neuroscience” researchers, using fMRI scans, have shown liars’ brains activating in places that honest people’s brains do not.

Expressing Emotion

Detecting Emotion in Others

12-6. Describe how we communicate nonverbally.

All of us communicate nonverbally as well as verbally. For example, a firm handshake immediately conveys an outgoing, expressive personality. With a gaze, an averted glance, or a stare, we can communicate intimacy, submission, or dominance. Most people can detect nonverbal cues, and we are especially sensitive to nonverbal threats. Experience contributes to our sensitivity to cues, as studies of abused children demonstrate.

Our brains are rather amazing detectors of subtle expressions. For example, a mere 10-second clip of a teacher’s voice or face enabled viewers to assess whether the teacher liked and admired the child he or she was addressing. Despite our brain’s emotion-detecting skill, we find it difficult to detect deceiving expressions.

Introverts are better emotion-detectors than extraverts, although extraverts are easier to read. The absence of gestures, facial expressions, and tones of voice in electronic communications deprives us of an important source of information.
Gender, Emotion, and Nonverbal Behavior

- Exercise: The Real Science Behind the Show *Lie to Me*

12-7. *Discuss whether the genders differ in their ability to communicate nonverbally.*

Women generally surpass men at reading people’s emotional cues. Women’s nonverbal sensitivity helps explain their greater emotional literacy. Their skill at decoding others’ emotions may also contribute to their greater emotional responsiveness. When surveyed, women are far more likely than men to describe themselves as empathic, and they are more likely to express empathy. Women also tend to experience emotional events more deeply with greater brain activation in areas sensitive to emotion.

Culture and Emotional Expression

- Lectures: Cultural Differences in Vocal Expression of Emotions

12-8. *Explain whether gestures and facial expressions mean the same thing in all cultures.*

Although some gestures are culturally determined, facial expressions, such as those of happiness and anger, are common the world over. Children’s facial expressions, even those of blind children who have never seen a face, are also universal. Charles Darwin suggested that before our ancient ancestors communicated in words, their ability to convey threats, greetings, and submissions with facial expressions helped them survive. Emotional expressions may also enhance our survival in other ways. For example, surprise widens the eyes, enabling us to take in more information. Disgust wrinkles the nose, closing it from foul odors. Cultures differ in how much they express emotions. For example, cultures that value individuality display mostly visible emotions. In Chinese culture, which encourages people to adjust to others, personal emotions are less visibly displayed. Like most psychological events, emotion is best understood as a biological, cognitive, and social-cultural phenomenon.

The Effects of Facial Expressions

- Lecture: “Catch the Feeling”
- Exercises: Facial Feedback and the James-Lange Theory of Emotion
- LaunchPad: Emotions and Facial Expression; Ekman’s Studies on Facial Expressions of Emotion


The facial feedback effect indicates that expressions amplify our emotions by activating muscles associated with specific states, and the muscles signal the body to respond as though we were experiencing those states. For example, students induced to make a frowning expression reported feeling a little angry. Students induced to smile felt happier and found cartoons funnier. Similarly, the behavior feedback effect shows that if we move our body as we would when experiencing some emotion (shuffling along with downcast eyes, as when sad), we are likely to feel that emotion to some degree. Acting as another acts helps us feel what another feels.

Experiencing Emotion

- Exercises: The Affect Grid; Individual Differences in Emotional Complexity; The Disgust Scale; Envy and Jealousy
- Lecture: Elevation, Gratitude, and Admiration
- Videos: Author Karen Thompson Walker on Fear; Folk Musician Joe Kowan on Fear

12-10. *Name some basic emotions, and describe two dimensions that help to differentiate them.*

Carroll Izard’s investigations identified 10 basic emotions: joy, interest-excitement, surprise, sadness, anger, disgust, contempt, fear, shame, and guilt. Although other researchers argue for additional emotions, Izard contends that other emotions are combinations of these 10. When psychologists have asked people to report their experiences of different emotions, all seem to place emo-
tions along the dimensions of pleasant/positive versus unpleasant/negative (the emotion’s valence) and high versus low arousal. On the valence and arousal dimensions, terrified is more frightened than afraid, and delighted is happier than happy.

Anger

- Project: Monitoring Anger
- Feature Film: Fried Green Tomatoes and Expressing Anger
- Video: Forgiveness
- LaunchPad: Rage: One Man’s Story and Treatment

12-11. Identify the causes and consequences of anger.

People report that anger is often a response to friends’ or loved ones’ misdeeds and is especially common when those acts seem willful, unjustified, and avoidable. Blameless annoyances such as foul odors, high temperatures, or a traffic jam can also make us angry.

Although “blowing off steam” may temporarily calm an angry person, it may also amplify underlying hostility, and it may provoke retaliation. The catharsis hypothesis maintains that “releasing” aggressive energy through action or fantasy reduces anger. Research has not supported the catharsis hypothesis. Angry outbursts may be reinforcing and therefore habit forming. In contrast, anger expressed as a nonaccusing statement of feeling can benefit relationships by leading to reconciliation rather than retaliation. When reconciliation fails, forgiveness can reduce one’s anger and its physical symptoms.

Happiness

- Exercises: A Positive Spin on Things; Flourishing: Beyond Positive Emotions and Pleasure; Adaptation Level; Fostering Happiness in Your Own Life
- Video: Collection of TED Talks on Happiness
- Lectures: Two Dimensions of Positive Affect; Happiness Around the World; Cultural Differences in Happiness
- LaunchPad: The Search for Happiness

12-12. Define the feel-good, do-good phenomenon, and describe the focus of positive psychology research.

A good mood boosts people’s perceptions of the world and their willingness to help others (the feel-good, do-good phenomenon). Mood-boosting experiences make us more likely to give money, pick up someone’s dropped papers, volunteer time, and do other good deeds.

The study of personal control and optimism reflects the new interest in positive psychology, the scientific study of optimal human functioning. Although it shares with humanistic psychology an interest in fostering human fulfillment, its origins and methodology are scientific. Positive psychology studies positive emotions, positive character, and positive groups, communities, and cultures.

After decades of focusing on negative emotions, psychologists who emphasize positive psychology are now actively exploring the causes and consequences of subjective well-being (self-perceived happiness or satisfaction with life).

12-13. Describe how time, wealth, adaptation, and comparison affect our happiness levels.

Positive emotion rises over the early to middle part of most days. Although stressful events trigger bad moods, the gloom nearly always lifts by the next day. Times of elation are similarly hard to sustain and, over the long run, our emotional ups and downs tend to balance. Even significant bad events, such as a serious illness, seldom destroy happiness for long. The surprising reality is that we overestimate the duration of emotions and underestimate our resiliency and capacity to adapt.

At a basic level, money helps us to avoid misery, but having it is no guarantee of happiness. Sudden increases in wealth such as winning a state lottery only increase happiness in the short
term. In the long run, increased affluence hardly affects happiness, partly because of the *diminishing returns* phenomenon. For example, during the last four decades, the average U.S. citizen’s buying power almost tripled, yet the average American is no happier. More generally, research indicates that economic growth in affluent countries has not boosted morale or social well-being. Ironically, those who strive hardest for wealth tend to experience lower well-being. What matters more is intimacy, personal growth, and contribution to the community.

The *adaptation-level phenomenon* describes our tendency to judge various stimuli relative to those we have previously experienced. If our income or social prestige increases, we may feel initial pleasure. However, we then adapt to this new level of achievement, come to see it as normal, and require something better to give us another surge of happiness.

*Relative deprivation* is the perception that one is worse off relative to those with whom one compares oneself. As people climb the ladder of success, they mostly compare themselves with those who are at or above their current level. This explains why increases in income may do little to increase happiness.

12-14. *Identify some predictors of happiness.*

High self-esteem, close friendships or a satisfying marriage, and meaningful religious faith are among the predictors of happiness. Age, gender, parenthood, and physical attractiveness are among the factors unrelated to happiness.

## Stress and Illness

### Stress: Some Basic Concepts

- Project: Constructing a Family Health History
- Exercise: The Stress Appraisal Measure
- Lectures: Early Stress at Home and Later Physical Problems; Daily Hazzles; Stress and Economic Change
- LaunchPad: Stress; Selye’s Stress Response Studies; Measuring Stress While Running With the Bulls; John and Julie Gottman Examine Marital and Family Stress

12-15. *Identify events that provoke stress responses, and describe how we respond and adapt to stress.*

*Stress* is not just a stimulus or a response; rather, it is the process by which we appraise and respond to a threatening or challenging event. When perceived as challenges, stressors can arouse and motivate us to conquer problems. When perceived as threats, prolonged stressors can harm us and increase the risk of illness.

- Exercises: College Undergraduate Stress Scale; Daily Hazzles; 2014 Burden of Stress in America Survey
- Lecture: Stress and Economic Change

Catastrophic floods, hurricanes, and fires can result in significant damage to emotional and physical health. Those who experience significant life changes, such as the death of a spouse, divorce, or loss of a job, are vulnerable to disease. Experiencing a cluster of such crises puts one even more at risk. Daily hassles, such as spotty phone connections, long lines at the store, aggravating housemates, and e-mail and text spam, may be the most significant sources of stress. Over time, these little stressors take a toll on our health and well-being.

Walter Cannon confirmed that the stress response is part of a unified mind-body system. He observed that, in response to stress, the sympathetic nervous system activates the secretion of stress hormones, triggers increased heart rate and respiration, diverts blood from digestion to skeletal muscles, dulls feelings of pain, and releases sugar and fat from the body’s stores, all to prepare the body for either *fight or flight*. In addition to this first (and faster) stress response system, a slower system involves the cerebral cortex stimulating the hypothalamus and the pituitary gland to trigger the release of *glucocorticoid* stress hormones, such as *cortisol*, from the outer part of the adrenal glands.
In Hans Selye’s general adaptation syndrome (GAS), the body’s adaptive response to stress is composed of three stages. In Phase 1, we experience an alarm reaction due to the sudden activation of our sympathetic nervous system. Heart rate increases and blood is diverted to the skeletal muscles. With our resources mobilized, we then fight the challenge during Phase 2, resistance. Temperature, blood pressure, and respiration remain high, and there is a sudden outpouring of stress hormones. If the stress is persistent, it may eventually deplete our body’s reserves during Phase 3, exhaustion. With exhaustion, we are more vulnerable to illness or even, in extreme cases, collapse and death.

People deal with stress in various ways. One study found the shortening of telomeres in women who suffered enduring stress as caregivers for children with serious disorders. A common response to a loved one’s death is to withdraw, thus conserving energy. A more common stress response in women is tend and befriend. Facing stress, men more often than women tend to withdraw socially, turn to alcohol, or become aggressive.

Stress and Vulnerability to Disease

LaunchPad: Stress and the Immune System: Caretakers and Risk; Fighting Cancer: Mobilizing the Immune System; John and Julie Gottman Examine Marital and Family Stress

12-16. Describe how stress makes us more vulnerable to disease.

Prolonged stress increases our risk for serious illness and death. By studying how our emotions and personality influence our risk of disease, the effects of stress, and the promotion of healthier living, health psychologists contribute to behavioral medicine, the interdisciplinary field that integrates behavioral and medical knowledge. Our understanding of the impact of stress on resistance to disease has fostered the development of the field of psychoneuroimmunology, which studies how psychological, neural, and endocrine processes together affect our immune system and resulting health.

When the immune system functions properly, it keeps you healthy by isolating and destroying bacteria, viruses, and other invaders. Four types of cells are active in these search-and-destroy missions: B lymphocytes are important in fighting bacterial infections, and T lymphocytes fight cancer cells, viruses, and foreign substances. Two other agents of the immune system are the macrophage and the natural killer cells (NK cells). When animals are physically restrained, given unavoidable electric shocks, or subjected to noise, crowding, cold water, social defeat, or maternal separation, they become more susceptible to disease. Studies suggest that stress similarly depresses the human immune system, making us more vulnerable to illness. The immune system can err in two directions: overreacting it may attack the body’s own tissues, or underreacting it may allow a virus to erupt.

Stress and negative emotions correlate with a progression of HIV infection to AIDS and with the speed of decline in those infected. Efforts to reduce stress also help somewhat to control the disease. Educational initiatives, bereavement support groups, cognitive therapy, relaxation training, and exercise programs that reduce distress have all had positive consequences for HIV-positive individuals.

Although stress does not produce cancer cells, some researchers have reported that people are at risk for cancer a year or so after experiencing depression, helplessness, or bereavement. A large Swedish study found that people with a history of workplace stress had greater risk of colon cancer than those who reported no such problems. Although a relaxed, hopeful attitude may enhance the body’s natural defenses against a few proliferating cancer cells, merely maintaining a determined attitude is not likely to derail the powerful biological forces at work in advanced cancer or AIDS.
Explain why some of us are more prone than others to coronary heart disease.

Stress can increase the risk of coronary heart disease, the leading cause of death in North America. It has been linked with the competitive, hard-driving, impatient, time-conscious, super motivated, verbally aggressive, and easily angered Type A personality. The toxic core of Type A is negative emotions, especially the anger associated with an aggressively reactive temperament. Under stress, the sympathetic nervous system of the Type A person redistributes bloodflow to the muscles and away from internal organs, such as the liver, which removes cholesterol and fat from the blood. The resulting excess cholesterol later gets deposited around the heart. The more easy-going Type B personality is less physiologically reactive when harassed or given a difficult challenge and less susceptible to coronary heart disease. Pessimism and depression also can have a toxic effect on a person’s health. Both heart disease and depression may result when chronic stress triggers persistent inflammation.

People with another personality type—Type D—suppress their negative emotion to avoid social disapproval. In one analysis, having a Type D personality significantly increased risk for mortality and nonfatal heart attack.

Health and Coping

Coping With Stress

Identify two ways that people try to alleviate stress.

We cope with stress by finding emotional, cognitive, or behavioral ways to alleviate it. Through problem-focused coping, we attempt to alleviate stress by changing the stressor or the way we interact with that stressor. We tend to use problem-focused strategies when we think we can change the situation, or at least change ourselves to more capably deal with the situation. We tend to use emotion-focused coping when we believe we cannot change a situation. For example, we may attempt to gain emotional distance from a damaging, discontinued relationship.

Explain how a perceived lack of control can affect health.

For some animals and people, a series of uncontrollable events creates a state of learned helplessness, with feelings of passive resignation. Both animal and human studies show that loss of control provokes the strongest stress response (provoking an outpouring of stress hormones, an increase in blood pressure, and a drop in immune responses), which can contribute to health problems. Control may help explain the well-established link between economic status and longevity.

In examining our interactions with our environment, social-cognitive psychologists emphasize our sense of personal control, that is, whether we learn to see ourselves as controlling or as being controlled by our environment. People who perceive an internal rather than an external locus of control achieve more in school and work, enjoy better health, are more independent, and are less depressed. Moreover, they are better able to delay gratification and cope with various stresses.

Describe how self-control can be depleted, and explain why it is important to build this strength.

Self-control, the ability to control impulses and delay short-term gratification for longer-term rewards, predicts good health, higher income, and better grades. Self-control is constantly changing. Like a muscle, self-control weakens after use, recovers after rest, and grows stronger with
exercise. Strengthened self-control improves people’s performance on laboratory tasks and improves their self-management of eating, drinking, anger, and household chores.


Optimism and pessimism influence stress vulnerability. Optimists perceive more control, cope better with stressful events, and enjoy better health. Compared with pessimists, optimists report less fatigue; have fewer coughs, aches, and pains; and respond to stress with smaller increases in blood pressure. Optimism runs in families. One genetic marker of optimism is a gene that enhances the social-bonding hormone oxytocin.

LaunchPad: Companionship and Support: Pets Fill the Void

12-22. Describe how social support promotes good health.

Feeling liked, affirmed, and encouraged by intimate friends and family promotes both happiness and health. Compared with those who have few social ties, people supported by close relationships are less likely to die prematurely. Carefully controlled studies also indicate that people in low-conflict marriages live longer, healthier lives than the unmarried. Social support strengthens immune functioning, calms the cardiovascular system, and lowers blood pressure and stress hormones. Close relationships provide an opportunity to confide painful feelings.

Reducing Stress

LaunchPad: Experience and Exercise: Generating New Brain Cells

12-23. Discuss the effectiveness of aerobic exercise as a way to manage stress and improve well-being.

Aerobic exercise, sustained exercise that increases heart and lung fitness, can reduce stress, depression, and anxiety. It strengthens the heart, increases bloodflow, keeps blood vessels open, and lowers both blood pressure and the blood pressure reaction to stress. Research has linked aerobic exercise to higher levels of neurotransmitters that boost moods and to enhanced cognitive abilities. And it may foster neurogenesis.

LaunchPad: Calming Down May Not Be the Best Way to Cope With Performance Anxiety

12-24. Describe the ways in which relaxation and meditation might influence stress and health.

Biofeedback, a system of recording, amplifying, and feeding back information about subtle physiological responses, enables people to control specific physiological responses. Research suggests that biofeedback works best on tension headaches. Simpler methods of relaxation produce many of the technique’s same benefits. For example, research indicates that relaxation procedures can help alleviate headaches, hypertension, anxiety, and insomnia. In Type A heart-attack survivors, relaxation lowers rates of recurring attacks. Those experienced in meditation assume a comfortable position, breathe deeply, relax their muscles, close their eyes, and focus on a simple repeated phrase. Research on mindfulness meditation found that it is associated with improved immune functioning, reduced anxiety and depression, and coping. Mindfulness practices have also been linked with reductions in sleep problems, cigarette use, binge eating, and alcohol and other substance use disorders. How does it work? Correlational and experimental studies offer three explanations. Mindfulness strengthens connections among regions in the brain, activates brain regions associated with more reflective awareness, and calms brain activation in emotional situations.
Describe the faith factor, and offer some possible explanations for the link between faith and health.

Research indicates that religiously active people live longer than those who are not religiously active. Investigators who attempt to explain this faith factor have isolated three intervening variables. (1) Religiously active people have healthier lifestyles; for example, they smoke and drink less. Also, religion promotes self-control. (2) Faith communities provide social support networks and often encourage marriage, which, when happy, is linked with better health and a longer life span. (3) Attendance at religious services is often accompanied by a coherent worldview, sense of hope for the future, feelings of acceptance, and a relaxed meditative state. These may enhance positive emotions and immune functioning, and decrease feelings of stress and anxiety.