facing cancer, often leads people later to report an increased appreciation for life, more meaningful relationships, increased personal strength, changed priorities, and a richer spiritual life. This idea—that suffering has transformative power—is also found in Judaism, Christianity, Hinduism, Buddhism, and Islam. The idea is confirmed by research with ordinary people. Compared with those with traumatic life histories and with those unchallenged by any significant adversity, people whose life history includes *some* adversity tend to enjoy better mental health and well-being (Seery et al., 2010). Out of even our worst experiences some good can come. Like the body, the mind has great recuperative powers and may grow stronger with exertion.

Understanding Anxiety Disorders, OCD, and PTSD

66-4 How do the learning and biological perspectives explain anxiety disorders, OCD, and PTSD?

Anxiety is both a feeling and a cognition, a doubt-laden appraisal of one's safety or social skill. How do these anxious feelings and cognitions arise? Freud's psychoanalytic theory proposed that, beginning in childhood, people *repress* intolerable impulses, ideas, and feelings and that this submerged mental energy sometimes produces mystifying symptoms, such as anxiety. Today's psychologists have instead turned to two contemporary perspectives—learning and biological.

The Learning Perspective

CLASSICAL AND OPERANT CONDITIONING

When bad events happen unpredictably and uncontrollably, anxiety or other disorders often develop (Field, 2006b; Mineka & Oehlberg, 2008). Recall from Unit VI that dogs learn to fear neutral stimuli associated with shock and that infants come to fear furry objects associated with frightening noises. Using classical conditioning, researchers have also created chronically anxious, ulcer-prone rats by giving them unpredictable electric shocks (Schwartz, 1984). Like assault victims who report feeling anxious when returning to the scene of the crime, the rats become apprehensive in their lab environment. This link between conditioned fear and general anxiety helps explain why anxious or traumatized people are hyperattentive to possible threats, and how panic-prone people come to associate anxiety with certain cues (Bar-Haim et al., 2007; Bouton et al., 2001). In one survey, 58 percent of those with social anxiety disorder experienced their disorder after a traumatic event (Ost & Hugdahl, 1981).

Through conditioning, the short list of naturally painful and frightening events can multiply into a long list of human fears. My car was once struck by another whose driver missed a stop sign. For months afterward, I felt a twinge of unease when any car approached from a side street. Marilyn's phobia of thunderstorms may have been similarly conditioned during a terrifying or painful experience associated with a thunderstorm.

Two specific learning processes can contribute to these disorders. The first, *stimulus generalization,* occurs, for example, when a person attacked by a fierce dog later develops a fear of *all* dogs. The second learning process, *reinforcement,* helps maintain our phobias and compulsions after they arise. Avoiding or escaping the feared situation reduces anxiety, thus reinforcing the phobic behavior. Feeling anxious or fearing a panic attack, a person may go inside and be reinforced by feeling calmer (Antony et al., 1992). Compulsive behaviors operate similarly. If washing your hands relieves your feelings of anxiety, you may wash your hands again when those feelings return.

OBSERVATIONAL LEARNING

We may also learn fear through observational learning—by observing others' fears. Susan Mineka (1985, 2002) sought to explain why nearly all monkeys reared in the wild fear snakes, yet lab-reared monkeys do not. Surely, most wild monkeys do not actually suffer snake bites.

AP® Exam Tip

This is a good time to return to Unit VI and review the principles of classical and operant conditioning.

TEACH

Concept Connections

Review the components of classical conditioning that led to Little Albert developing a fear of white, furry objects (Unit VI):

- Unconditioned stimulus (US)—loud "bang" that occurred when lead pipes were struck
- Unconditioned response (UR)—fear of the loud "bang"
- Conditioned stimulus (CS)—white, furry objects
- Conditioned response (CR)—fear, but this time in response to the white, furry object

Have students recall that the fear response John Watson cultivated so easily was reversed in other patients by his student Mary Cover Jones. She used classical conditioning to remove a fear response from individuals who had developed a fear of a certain object. She used a pleasant US, like candy or food, so patients could associate the pleasant feeling with the object they had come to fear.

Do they learn their fear through observation? To find out, Mineka experimented with six monkeys reared in the wild (all strongly fearful of snakes) and their lab-reared offspring (virtually none of which feared snakes). After repeatedly observing their parents or peers refusing to reach for food in the presence of a snake, the younger monkeys developed a similar strong fear of snakes. When retested three months later, their learned fear persisted. Humans likewise learn fears by observing others (Olsson et al., 2007).

COGNITION

Observational learning is not the only cognitive influence on feelings of anxiety. As the next unit's discussion of cognitive-behavioral therapy illustrates, our interpretations and irrational beliefs can also cause feelings of anxiety. Whether we interpret the creaky sound in the old house simply as the wind or as a possible knife-wielding intruder determines whether we panic. People with anxiety disorder also tend to be *hypervigilant.* A pounding heart becomes a sign of a heart attack. A lone spider near the bed becomes a likely infestation. An everyday disagreement with a friend or boss spells possible doom for the relationship. Anxiety is especially common when people cannot switch off such intrusive thoughts and perceive a loss of control and sense of helplessness (Franklin & Foa, 2011).

The Biological Perspective

There is, however, more to anxiety, OCD, and PTSD than conditioning, observational learning, and cognition. The biological perspective can help us understand why few people develop lasting phobias after suffering traumas, why we learn some fears more readily, and why some individuals are more vulnerable.

NATURAL SELECTION

We humans seem biologically prepared to fear threats faced by our ancestors. Our phobias focus on such specific fears: spiders, snakes, and other animals; enclosed spaces and heights; storms and darkness. (Those fearless about these occasional threats were less likely to survive and leave descendants.) Thus, even in Britain, with only one poisonous snake species, people often fear snakes. And preschool children more speedily detect snakes in a scene than flowers, caterpillars, or frogs (LoBue & DeLoache, 2008). It is easy to condition and hard to extinguish fears of such "evolutionarily relevant" stimuli (Coelho & Purkis, 2009; Davey, 1995; Öhman, 2009).

Our modern fears can also have an evolutionary explanation. For example, a fear of flying may come from our biological predisposition to fear confinement and heights. Moreover, consider what people tend *not* to learn to fear. World War II air raids produced remarkably few lasting phobias. As the air blitzes continued, the British, Japanese, and German populations became not more panicked, but rather more indifferent to planes outside their immediate neighborhoods (Mineka & Zinbarg, 1996). Evolution has not prepared us to fear bombs dropping from the sky.

Just as our phobias focus on dangers faced by our ancestors, our compulsive acts typically exaggerate behaviors that contributed to our species' survival. Grooming gone wild becomes hair pulling. Washing up becomes ritual hand washing. Checking territorial boundaries becomes rechecking an already locked door (Rapoport, 1989).

GENES

Some people are more anxious than others. Genes matter. Pair a traumatic event with a sensitive, high-strung temperament and the result may be a new phobia (Belsky & Pluess, 2009). Some of us have genes that make us like orchids—fragile, yet capable of beauty under favorable circumstances. Others of us are like dandelions—hardy, and able to thrive in varied circumstances (Ellis & Boyce, 2008).

Among monkeys, fearfulness runs in families. Individual monkeys react more strongly to stress if their close biological relatives are anxiously reactive (Suomi, 1986).

TEACH

Teaching Tip

Have your students name fears that have evolved to help further our species. Ask them to ponder how some common fears might have developed:

- Public speaking
- Flying
- Germs
- Failure

TEACH

Concept Connections

Remind students that studies of identical twins provide insight into which behaviors are genetically predisposed and which behaviors are environmentally influenced. Identical twins share 100 percent of their DNA, so comparisons of their behaviors can shed light on what might be passed on in our genetic code.

Reuters/Mike Blake/Landov

Fearless The biological perspective helps us understand why most people would be too afraid to try U.S. Olympic snowboarder Shaun White's tricks. White is less vulnerable to a fear of heights than most of us!

In humans, vulnerability to anxiety disorders rises when an afflicted relative is an identical twin (Hettema et al., 2001; Kendler et al., 1992, 1999, 2002a,b). Identical twins also may develop similar phobias, even when raised separately (Carey, 1990; Eckert et al., 1981). One pair of 35-year-old female identical twins independently became so afraid of water that each would wade in the ocean backward and only up to the knees.

Given the genetic contribution to anxiety disorders, researchers are now sleuthing the culprit genes. One research team has identified 17 genes that appear to be expressed with typical anxiety disorder symptoms (Hovatta et al., 2005). Other teams have found genes associated specifically with OCD (Dodman et al., 2010; Hu et al., 2006).

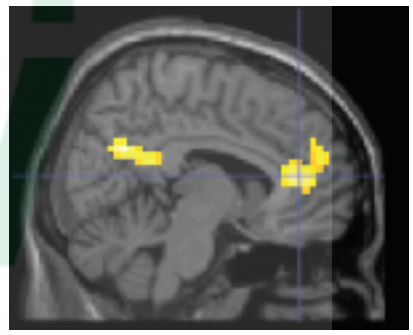
Genes influence disorders by regulating neurotransmitters. Some studies point to an anxiety gene that affects brain levels of *serotonin,* a neurotransmitter that influences sleep and mood (Canli, 2008). Other studies implicate genes that regulate the neurotransmitter *glutamate* (Lafleur et al., 2006; Welch et al., 2007). With too much glutamate, the brain's alarm centers become overactive.

THE BRAIN

Generalized anxiety, panic attacks, PTSD, and even obsessions and compulsions are manifested biologically as an overarousal of brain areas involved in impulse control and habitual behaviors. When the disordered brain detects that something is amiss, it seems to generate a mental hiccup of repeating thoughts or actions (Gehring et al., 2000). Brain scans of people with OCD reveal elevated activity in specific brain areas during behaviors such as compulsive hand washing, checking, ordering, or hoarding (Insel, 2010; Mataix-Cols et al., 2004, 2005). As **FIGURE 66.2** shows, the *anterior cingulate cortex,* a brain region that monitors our actions and checks for errors, seems especially likely to be hyperactive in those with OCD (Maltby et al., 2005). Fear-learning experiences that traumatize the brain can also create fear circuits within the amygdala (Etkin & Wager, 2007; Kolassa & Elbert, 2007; Maren, 2007). Some antidepressant drugs dampen this fear-circuit activity and its associated obsessive-compulsive behavior.

Fears can also be blunted by giving people drugs, such as propranolol or D-Cycloserine, as they recall and then rerecord ("reconsolidate") a traumatic experience (Kindt et al., 2009; Norberg, et al., 2008). Although they don't forget the experience, the associated emotion is largely erased.

Figure 66.2
An obsessive-compulsive brain Neuroscientists Nicholas Maltby, David Tolin, and their colleagues (2005) used functional MRI scans to compare the brains of those with and without OCD as they engaged in a challenging cognitive task. The scans of those with OCD showed elevated activity in the anterior cingulate cortex in the brain's frontal area (indicated by the yellow area on the far right).



Reprinted from *Neuroimage,* 24, Maltby, N., Tolin, D. F., Worhunsky, P., O'Keefe, T. M., & Kiehl, K. A., Dysfunctional action monitoring in hyperactive visual feedback circuits in obsessive-compulsive disorder: An event-related fMRI study, 495–503, 2005, with permission from Elsevier.

TEACH

Concept Connections

Remind students that the frontal lobes are responsible for judgment and decision making. If people with OCD have overactive frontal lobes, then they are controlled by overzealous decision making. They cannot attend to the decisions they should be making, insofar as their behaviors are ruled by repetitive and overbearing thoughts.

ENGAGE

Critical Questions

What would life be like without fear? Have students offer scenarios where fear is detrimental or useful to daily life. If fear weren't an issue, how would those situations be different?