

## CHAPTER 6

# Attitude and Behavior Change



## Read This Chapter to Learn About

- Associative Learning
- Observational Learning
- Theories of Attitudes and Behavior Change

## ASSOCIATIVE LEARNING

**Associative learning** is a specific type of learning. In this type of learning the individual learns to “associate” or pair a specific stimulus with a specific response based on the environment around him or her. This association is not necessarily a conscious process and can include involuntary learned responses (e.g., children in a classroom becoming restless at 2:55 p.m. on a Friday before the 3 p.m. bell). This category of learning includes classical conditioning and operant conditioning.

### Classical Conditioning

Classical conditioning is one of the first associative learning methods that behavioral researchers understood. Classical conditioning has now been shown to occur across both psychological and physiological processes. **Classical conditioning** is a form of learning in which a response originally caused by one stimulus is also evoked by a second, unassociated stimulus. The Russian physiologist Ivan Pavlov and his dogs are most famously associated with this type of conditioning. Pavlov noticed that as the dogs’ dinnertime approached (**unconditioned stimulus**, or **UCS**), they began to

92

UNIT II:  
Behavior

salivate (**unconditioned response**, or **UCR**). He found this unusual because the dogs had not eaten anything, so there was no physiological reason for the increased salivation before the dinner was actually served. Pavlov then experimented with ringing a bell (**neutral stimulus**) before feeding his dogs. As a result, the dogs began to associate the (previously neutral) bell sound with food and would salivate upon hearing the bell. The bell became a **conditioned stimulus (CS)**, and the salivation response became a **conditioned response (CR)**. This experiment is diagrammed in Figure 6-1. The learning process needed to connect previously unconnected stimuli (neutral stimuli) and responses is what changes a UCS to a CS and a UCR to a CR.

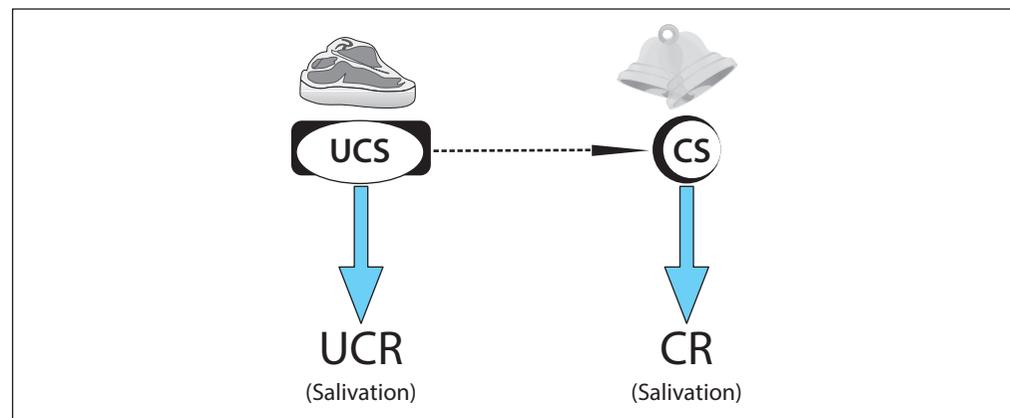


FIGURE 6-1 Classical conditioning.

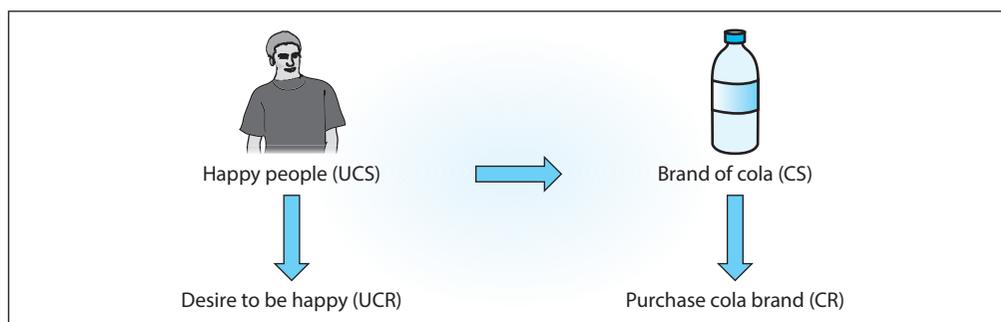
Learning to connect neutral stimuli to a conditioned response is the process of **acquisition**. If the CS and CR are repeatedly connected, the CR will remain strong. However, if the CS (e.g., the bell sound) occurs repeatedly without the UCR trigger (e.g., the food), eventually the CR will diminish in response to the CS and then stop altogether in a process known as **extinction** (and the CS will once again become a neutral stimulus). **Spontaneous recovery** can occur if there is a prolonged time when the CS does not occur and only the UCS/UCR is present. At a later time point the CS is presented again.

**Generalization** can also occur with the CS. This is the process of expanding the parameters of the CS to include other stimuli (e.g., the dogs begin to show the CR in response to a bell, a clicking noise, and a tone). The psychologist John B. Watson and the case of Little Albert is a classic example of this phenomenon. Dr. Watson gave 11-month-old Albert a white rat. The child was playful with the rat until Watson struck a loud gong (UCS) near the child's head, which caused pain (UCR). Quickly the child began to associate the rat with the pain of the gong and began to show a fear response (CR) to rats (CS). Soon he also generalized this fear response (CR) and

began to show fear in the presence of white rabbits, white fur coats, a white dog, and Santa Claus beards, even though the gong was never used in the presence of those items. The process of generalization is the opposite of **discrimination**, in which the individual shrinks the parameters of the CS, requiring it to be more specific to show the CR.

## Classical Conditioning in Advertising

The concept of classical conditioning is widely used in advertising. A new product is initially a neutral stimulus. In a commercial, the product (neutral stimulus) is shown being used by young, active healthy people having a great time (UCS), whom the viewer desires to emulate (UCR). Over time, the previously neutral product becomes associated with the desire to be like the people in the commercial. At that point the product becomes a conditioned stimulus, and the desire to emulate the people in the commercial is a conditioned response. Figure 6-2 shows a diagram of this example.



**FIGURE 6-2** Classical conditioning in advertising.

Acquired fears or phobias are also often explainable through classical conditioning. For example, suppose an individual on an airplane flight experiences turbulence (UCS) and has a fear response (UCR). The individual generalizes from that one flight to all flights and has a severe fear response (CR) at every thought of another airplane flight (CS). Unlike other types of learning, phobias can be acquired quickly (often after one negative experience), generalize rapidly, and resist normal extinction.

Even physiologically, a person who experiences morning sleepiness is more alert (UCR) after drinking caffeinated coffee (UCS). After a while, just walking into the coffee shop (CS) where he or she buys morning coffee makes that individual feel more alert and awake (CR). The CS of the coffee shop creates the CR of wakefulness even before that first sip of coffee.

## Operant Conditioning

Operant conditioning is a slightly more complex form of associative learning, but it is very visible in daily living as a way in which individuals connect behavior to positive and negative outcomes to create behavioral change (See Table 6-1). **Operant conditioning** is defined as a method of learning that shapes behavior via rewards and punishments for individual actions. The individual learns that consequences are experienced as a result of certain actions and then shifts behavior to gain more positive consequences. The behaviorists Edward Thorndike and B. F. Skinner are most closely associated with the current understanding of this type of learning.

**TABLE 6-1** Operant Conditioning Behavioral Shaping Tools.

	Positive	Negative
<b>Reinforcement</b>	Giving a pleasant experience (giving a favorite food)	Taking away an unpleasant experience (removing a shock)
<b>Punishment</b>	Giving an unpleasant experience (shock)	Taking away a pleasant experience (removing a favorite food)

In operant conditioning, shaping occurs through the process of providing positive or negative rewards or punishments. **Reward** will encourage the repetition of a behavior. **Punishment** is designed to extinguish a behavior. **Positive** in this context means that a stimulus is given. **Negative** in this context indicates that a stimulus is taken away.

Within shaping stimuli, there are both primary and secondary reinforcers. **Primary reinforcers** (also called unconditioned reinforcers) are basic drivers that do not need to be taught (e.g., food, sex, comfort). **Secondary reinforcers** (also called conditioned reinforcers) are reinforcers that the individual has learned to value (e.g., getting an A on a test).

Through the use of appropriate reinforcement or punishment, an individual's or animal's behavior can be **shaped**. Behavior can be reinforced and expanded, and it can also be **extinguished** with the use of punishment in response to the behavior. Reinforcers and punishments can be provided on a number of **reinforcement schedules** that can determine the speed of adoption or extinction of a behavior (See Table 6-2).

There are many examples of operant conditioning in daily life. Casinos often use this technique to reinforce gambling behavior. The use of variable ratio reinforcement schedules (e.g., payouts) increases customers' gambling behavior and makes it more difficult for them to stop.

**TABLE 6-2** Variable and Fixed Reinforcement Schedules.

	Variable	Fixed	General
<b>Ratio (behavior)</b>	Reinforcer given after a varying number of displays of the behavior (e.g., a rat receives food after hitting the bar 1, 5, or 7 times)	Reinforcer given after a certain number of instances of the behavior (e.g., a rat receives food after every 3 bar presses)	Higher ratios (e.g., 1 food pellet for every 5 bar presses) result in higher response rates but are harder to teach initially than lower ratios (e.g., 1 pellet for 1 bar press)
<b>Interval (time)</b>	Reinforcer given after a varying amount of time (e.g., food is released for a random amount of time that a rat spends in a particular space)	Reinforcer given after a fixed period of time (e.g., food is released for every 15 minutes that a rat spends in a particular space)	Shorter intervals (30 seconds vs. 2 minutes) creating a higher response rate
<b>General</b>	Variable schedules resulting in greater resistance later to extinguishing of the behavior	Behaviors shaped by fixed ratios being easier to extinguish later	

When an individual is in a distressing situation, the hypothalamus-pituitary-adrenal (HPA) axis is activated, creating physiological discomfort. The individual then reviews the initial reason for the fear, creating psychological and cognitive discomfort. This combination of psychological and physiological distress creates an experience that the individual wishes to escape. This kind of operant learning is thus called **escape learning**, in which the individual learns to reduce exposure to a negative experience by escaping from a situation. The escape acts as a negative reinforcement of the escape behavior, a pattern that the individual is then likely to repeat. **Avoidance learning** is another powerful kind of conditioning. An individual may begin to avoid situations that cause fear and anxiety because avoidance reduces physiological arousal and psychological discomfort. Both escape learning and avoidance learning are very pertinent to the development and (later) treatment of anxiety disorders. If an individual is placed in conditions that create physiological and psychological distress, he or she learns to escape and later avoid the situation. Escape and avoidance then become reinforcing behaviors that can develop into phobic and anxiety disorders.

Operant conditioning is common as children grow and learn from their environment. For example, if a child has a temper tantrum and the parent gives in, the child learns that a temper tantrum will gain him or her something desirable, so this behavior is reinforced and the child is more likely to repeat it. This parental response is particularly reinforcing if the parent gives in only on random occasions (see earlier discussion on reinforcement schedule and extinction). Even when a parent

---

stops giving in, the child is likely to increase the behavior temporarily in what is known as an **extinction burst** before the extinction phase begins. On the other hand, children who are rewarded randomly for good behavior will have their behavior shaped in a more positive direction.

Some innate behaviors are **developmentally fixed** and are extremely resistant to shaping strategies. A classic example of this is the “monkeys and M&Ms” study. In this study, researchers placed two amounts of M&M candies, one larger and one smaller, in a dish. They attempted to teach the monkeys that if they chose the smaller of the two amounts, they would receive the larger amount. In other words, the researchers attempted to shape the monkeys’ behavior in direct opposition to the innate trait to pick the larger pile of candy. Despite multiple trials, and the monkeys’ evident distress every time they picked the larger pile (and watched it go instead to the researcher), the monkeys had extreme difficulty going against their innate behavior. From this, the researchers concluded that some behaviors are so innate and fixed that reshaping them by conditioning is extremely difficult or impossible. Even when such behaviors are changed, the subject will often drift back to the innate behavior—a process the researchers called **instinctive drift**.

Another biological factor that is very difficult to shape is **conditioned taste aversion**. This condition occurs when a single negative food or drink experience creates a very long-term wish to avoid that food. For example, if a person eats spaghetti and later that evening comes down with a severe stomach flu, that person may experience a conditioned taste aversion to spaghetti and may never eat it again. This developmentally fixed avoidance behavior is likely self-protective; the body influences the taste buds to avoid foods linked to danger.

Even after a behavior is learned, it is not static and can be modified by ongoing experiences. Those subsequent experiences may either reinforce or extinguish the originally learned behavior, or alter the parameters of that behavior (e.g., when or where the behavior occurs). This is true across both human and animal behaviors. There are also a number of inherent cognitive processes that increase the likelihood of associative learning. Between life experiences and the human cognitive processes that try to find reasons for a particular outcome, specific behaviors can be reinforced. For example, if a person wears bright red socks to a test and gets an A, that person might attribute the A to the red socks. He or she would continue to wear the red socks to every test and gain test-taking confidence, which may lead to ongoing success and reinforce the idea of the “lucky” socks. This individual has associated the outcome (the A) with the action (wearing red socks) and seeks to repeat the outcome by repeating the action. This process is called **identifying contingencies** in the environment. Identifying contingencies begins to explain the interaction between cognitive processes and life experiences in the process of associative learning.

---

## OBSERVATIONAL LEARNING

In contrast to associative learning/operant conditioning, in which the individual learns about stimuli-response from his or her own actions in the environment, **observational learning** is based on the individual watching how others interact with the environment.

Albert Bandura is the classic researcher associated with observational learning and modeling behavior. In **Bandura's model of observational learning**, there are four basic processes:

- **Attention** requires that the learner actively observes the model's behavior and the consequences of that behavior.
- **Retention** requires that the learner has the capacity to mentally store and recall those observations, perhaps even long after the initial observation.
- **Reproduction** is the learner's ability to transform the mental representations of that memory and to physically reproduce the observed behavior in the appropriate setting (which may be difficult; watching someone else play baseball doesn't help you throw a fastball).
- Finally, the **motivation** (e.g., reinforcer) to engage in reproducing the response must be present.

**Latent learning**, pioneered by the American psychologist Edward Tolman, occurs when an individual is not intending to learn something but gains information passively. For example, children who are driven around in the car every day eventually learn to navigate their neighborhood even though they are not explicitly taught. Information gained in latent learning may never be used, or it may be used at some distant point in time.

Observational learning can be observed in both animals and humans. Children often observe and model the behavior of adults around them. In Bandura's famous "Bobo doll experiment," children between the ages of 3 and 5 observed how an adult interacted with a 5-foot-tall doll and then were given an opportunity to play with the doll. Children who observed adults punching or kicking the doll were much more likely to act aggressively and violently toward the doll compared to children who observed the adult acting gently and kindly toward the doll. The gender of the child or adult did not matter, but the type of behavior the adult displayed (violent versus kind) had a strong influence on the child's later behavior. These results are potentially relevant to physical abuse; psychological and sociological studies show that children who are physically abused are more likely to become physical abusers as adults.

It is critical to understand that the acquisition of a specific behavioral response may be very different from the performance of that response, and this is a crucial difference between operant/associational and observational learning. Skinner (operant conditioning) and Bandura (observational learning) both agree that motivation and

---

reinforcement are critical to the development of behavior. But Skinner believed that reinforcement is critical to the **acquisition** of a behavior, whereas Bandura believed that learning from observing occurs regardless of reinforcement, though the **production** of the behavior relies on reinforcement.

The brain appears to be hardwired to engage in observational learning. In terms of evolution, humans are almost unique in the animal kingdom in that they explicitly teach their young. By comparison, most young animals simply acquire adult behaviors by observation. Even so, young humans still acquire many of their behaviors from observing adult models. **Mirror neurons**, located in the premotor cortex, the somatosensory cortex, and the inferior parietal cortex, are critical in the process of observational learning. These mirror neurons fire when the observed behavior and the action of the observer match. These mirror neurons are also implicated in mirroring facial expressions and emotions in others (e.g., an adult smiles at a 1-year-old infant and the infant smiles back). It is believed that this is why people share emotions with persons whom they do not know (e.g., feeling sad when a character in a film dies and the film characters are sad). It is also suspected that dysfunction of mirror neurons may at least partially account for the symptoms of autism spectrum disorders.

Examples of observational learning in human and animal behavior abound. For instance, birds learn to open sugar packets from outdoor coffee stands, children reproduce curse words from observing their older siblings, and young athletes review experts' techniques to improve their own performance. Children learn procrastination or timeliness from watching their parents. Even among adults, observing a friend making healthy food choices can influence an individual to make healthier choices.

## THEORIES OF ATTITUDES AND BEHAVIOR CHANGE

Altering attitudes and behaviors can be a difficult and complex process. The **elaboration likelihood model**, developed by John Cacioppo and Richard Petty, is an empirically supported model that explains how attitude change can occur. Cacioppo and Petty identified two "routes" to processing information that are designed to create attitude change. The two routes differ by the level of cognitive elaboration or processing that is done by the individual. The first is the **central route**, which is focused on more cognitive and logical arguments that the individual ponders carefully. Persuasive tactics that take this route place more cognitive load (high elaboration) on the individual, but result in more long-lasting attitude change and better predict behavior. The second is the **peripheral route**, which is more focused on nonlogical environmental persuasion tactics (e.g., loud music, attractive models, simple slogans) that place less cognitive load (minimal elaboration) on the individual. The peripheral route can create attitude change, but it is less long-lasting and less predictive of behavior.

---

Albert Bandura's **social cognitive theory** is another way to explain attitude change. Bandura identified the role of **reciprocal determinism** (the “two-way street”) in how individuals learn to interact with their environment. In this view, behavior, environment, and cognitive factors all interact with each other to determine which behaviors are reinforced (and are more likely to be repeated in the future). For example, suppose the environment includes an advertisement for a designer briefcase. A man who sees the advertisement thinks that the briefcase will help him look more professional and get a promotion, so he purchases the briefcase. If his boss offers the man a promotion before seeing the briefcase, the man might think, “That was a waste of money, I’ll never do that again.” Or he might think, “Perfect, the briefcase will look great in my big new office.” So the cognitions interact with the environment to determine if the behavior of purchasing expensive accessories is likely to be repeated. The environment of the persuasive statement interacts with the cognitions of the individual to determine the effect on the outcome (behavior).

A number of specific intrapersonal factors can also alter how a persuasive message is received. The **source** of the message is one such factor. The individual’s perception of the source’s expertise, credibility, and likability affects how the message is received. Other factors relate to the message itself. These factors include whether the argument presented is one-sided or two-sided (and if a two-sided argument involves straw-man arguments), the level of logic versus emotion in the message, and any appeals to emotions (e.g., fear or hope). Finally the characteristics of the **receiver** can affect how the message is heard. The receiver’s resistance to change, strong preexisting attitudes, and access to counterarguments can all decrease the likelihood of persuasion. It should also be noted that the “likability” of the source can be affected by the receiver’s biases regarding race, gender, or other demographic and social factors. While altering attitudes and behaviors is extremely challenging, there has been a great deal of research in this area by social psychologists, health psychologists, and public health specialists who hope to use these techniques to encourage healthy behavior (e.g., smoking cessation). In addition, advertisers and politicians have studied persuasion techniques for business and political purposes.



# Unit II Minitest

## 21 Questions

30 Minutes

This minitest is designed to assess your mastery of the content in Chapters 4 through 6 of this volume. The questions have been designed to simulate actual MCAT questions in terms of format and degree of difficulty. They are based on the content categories associated with the foundational concept that is the theme of this unit. They are also designed to test the scientific inquiry and reasoning skills that the test makers have identified as essential for success in medical school.

In this test, most of the questions are based on short passages that typically describe a research study or some similar process. There are also some questions that are not based on passages.

Use this test to measure your readiness for the actual MCAT. Try to answer all of the questions within the specified time limit. If you run out of time, you will know that you need to work on improving your pacing.

Complete answer explanations are provided at the end of the minitest. Pay particular attention to the answers for questions you got wrong or skipped. If necessary, go back and review the corresponding chapters or text sections in this unit.

Now turn the page and begin the Unit II Minitest.

102

UNIT II:  
Behavior

**Directions:** Choose the best answer to each of the following questions. Question 1 is not based on a passage.

1. Which personality theory characterizes personality as comprised by the interaction between three factors: the id, the ego, and the superego?
  - A. psychoanalytic theory
  - B. social-cognitive theory
  - C. humanistic theory
  - D. behaviorism

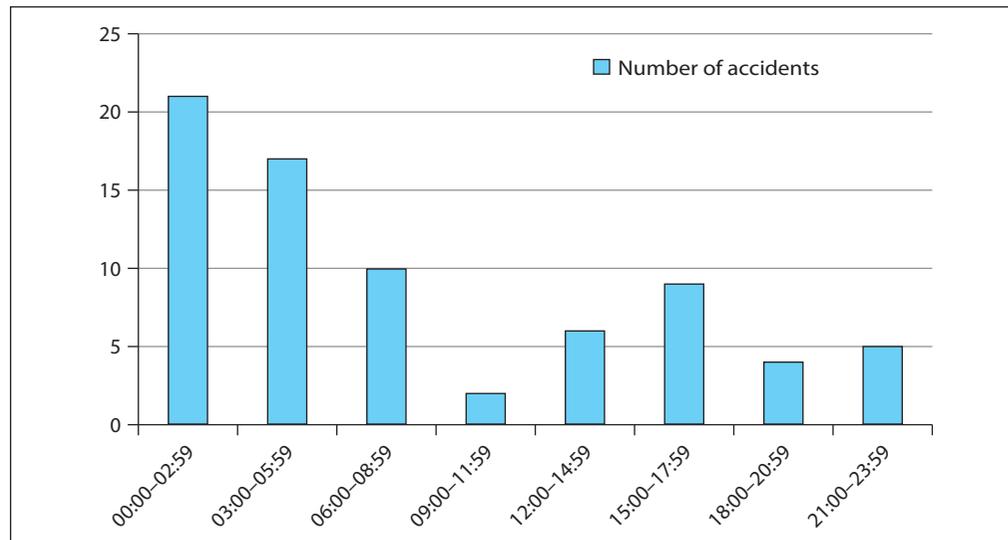
Questions 2–5 are based on the following passage.

**Passage I**

Research evaluating human performance under conditions of sleep deprivation has generally found that impaired functioning is observed during specific time intervals.

One such study used surveys to determine the characteristics of car accidents to evaluate the relationship between time of day and incidence of car accidents.

The following graph shows the number of accidents on the *y*-axis and the time of day on the *x*-axis.



Number of accidents by time of day. *Source:* Adapted with permission from Horne, J. A., & Reyner, L. A. (1995). "Sleep-related vehicle accidents." *British Medical Journal*, 310(6979), 565–567.

2. Based on the graph, which of the following is the MOST accurate statement?
  - A. Time of day is not related to the number of accidents.
  - B. Sleep deprivation has more impact during the day than at night.
  - C. Accidents were more likely during the early morning.
  - D. Accidents were more likely in the evening than at midday.

- 
3. What would happen to performance results over time if a similar study was conducted in an artificial environment and in the absence of circadian cues such as light?
- A. The accident peaks would drift to the left on the graph with a slightly shorter circadian cycle.
  - B. The accident peaks would drift to the right on the graph with a slightly longer circadian cycle.
  - C. There would be no change in the cycle, and the increased risk of accident would occur at roughly the same time.
  - D. There would be a breakdown in the cycle, and accidents would be equally likely to occur in any time frame.
4. Why might you expect the results to this study to remain consistent even for people who are time-shifted and consistently work during the early morning hours?
- A. Circadian timing is fixed and therefore cannot be shifted outside normal daytime hours.
  - B. Circadian timing is flexible but highly dependent on darkness, which will pressure the circadian cycle toward the nighttime hours.
  - C. Circadian timing is flexible but highly dependent on social interaction. The reason the data would remain the same is because people working at night have limited social interaction.
  - D. Circadian timing is flexible but highly dependent on light, which will push the circadian cycle toward the daylight hours.
5. Light exposure readjusts the circadian rhythm by acting on which brain structure?
- A. thalamus—lateral geniculate nucleus
  - B. midbrain—superior colliculus
  - C. brain stem—reticular formation
  - D. hypothalamus—suprachiasmatic nucleus

*Question 6 is not based on a passage.*

6. Which of the following is TRUE about somatoform disorders?
- A. Individuals can experience an exacerbation of symptoms of existing medical conditions.
  - B. Individuals are often faking symptoms of existing medical conditions.
  - C. Individuals will often explicitly cause harm to themselves to create medical conditions.
  - D. Pain can easily be identified as somatoform or real.

## 104

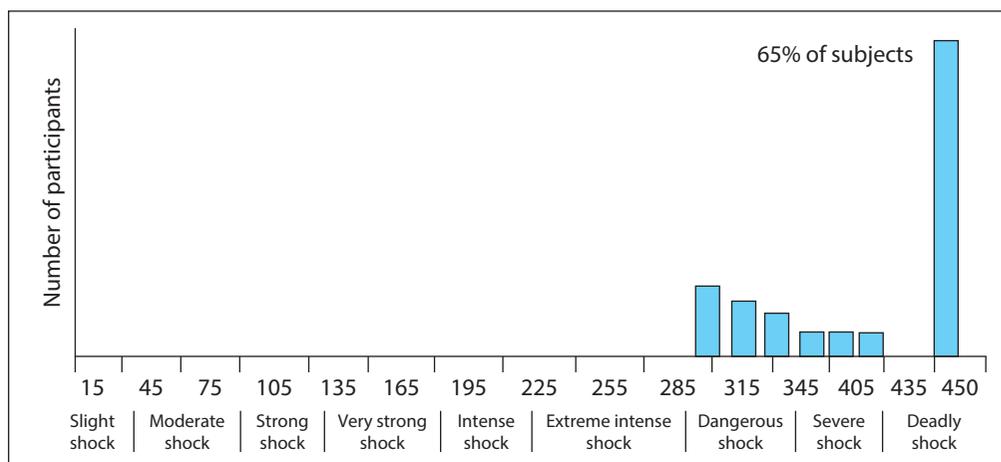
UNIT II:  
Behavior

Questions 7–10 are based on the following passage.

## Passage II

In a famous series of experiments, the social psychologist Stanley Milgram captured important observations about human compliance. Participants in the experiments were told to play the role of “teachers” and ask “learners” to answer questions. They were not told that the learners were actually actors. Every time a learner gave an incorrect answer, a confederate posing as an authority figure instructed the teacher to administer an electric shock to the learner. The learner would then pretend to suffer pain, even though the “shock” delivered via a realistic-looking apparatus was actually harmless. If a learner continued to provide incorrect answers, the authority figure told the teacher to increase the intensity of the “shock” all the way up to what was said to be a lethal level.

The results from the experiment are depicted in the following graph.



The Milgram experiment. Pretended shock intensity is listed on the  $x$ -axis and the number of participants who refused to continue past each level is presented on the  $y$ -axis. *Source:* Adapted with permission from Milgram, S. (1963). “Behavioral study of obedience.” *The Journal of Abnormal and Social Psychology*, 67(4), 371–378.

7. Based on the results from this study, which of the following is TRUE?
- The majority of participants administered what they believed was a potentially lethal shock.
  - The majority of participants refused to administer what they believed were lethal shocks.
  - The data can be interpreted to show that the teachers inadvertently administered what they believed were lethal shocks.
  - The data can be interpreted to show that the learners inadvertently answered questions that resulted in teachers administering what they believed were lethal shocks.

- 
8. In the Milgram experiment the participant teacher would typically:
- A. obey the authority figure despite the discomfort or pain exhibited by the learner.
  - B. resist the authority figure because of the discomfort or pain exhibited by the learner.
  - C. obey the learner despite protests from the authority figure.
  - D. obey the learner even when the learner exhibited discomfort or pain.
9. The Milgram experiment has been repeated in a number of cultures and with a number of design changes. Based on your knowledge of social psychology, what was shown to reduce the likelihood of the participant teacher administering a perceived lethal shock?
- A. The experiment was completed in a formal lab where the teacher was alone with the authority figure.
  - B. The authority figure was dressed in a lab coat and stood close to the teacher when giving the commands.
  - C. The participant teachers were recruited from an older population.
  - D. The participant teachers took part in a group discussion about the importance of ethics immediately prior to the teaching portion of the experiment.
10. In social psychology research, what does the term *obedience* represent?
- A. compliance to direct commands
  - B. compliance to requests from a group of people
  - C. compliance to implied pressure from social norms
  - D. compliance with internal morals and beliefs

*Question 11 is not based on a passage.*

11. Jack's roommate has offered to pay him 1 dollar per week for doing the dishes. Jack is reluctant because he doesn't like this chore, but he accepts. After a few days Jack decides that the chore is somewhat enjoyable. This reaction is consistent with which theory?
- A. groupthink theory
  - B. the bystander effect
  - C. cognitive dissonance
  - D. self-perception theory

*Questions 12–15 are based on the following passage.*

### Passage III

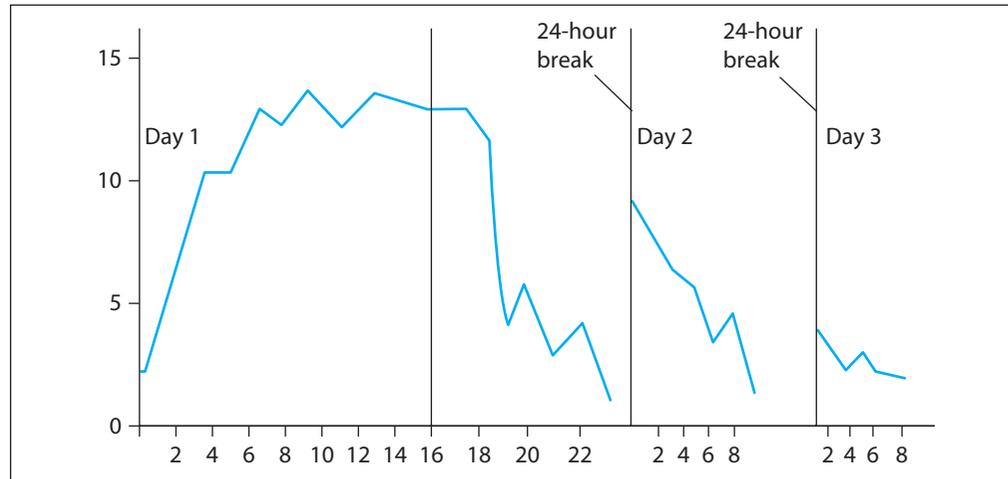
Classical conditioning is a long-studied and well-documented scientific concept. The Russian physiologist Ivan Pavlov is most associated with this concept and described the conditions necessary for conditioning to occur. Subsequent studies from both

## 106

UNIT II:  
Behavior

comparative and human psychology have supported these initial findings and expanded upon them.

The following graph shows a hypothetical example of conditioning trials for one of Pavlov's dogs over a number of days. During these trials a bell has been paired with the presentation of food. Trial numbers are displayed on the  $x$ -axis and the number of drops of the dog's saliva is displayed on the  $y$ -axis.



Classical conditioning. The number of drops of a dog's saliva is shown on the  $y$ -axis. The number of trials is shown on the  $x$ -axis.

12. Based on the saliva responses to stimuli shown in the graph, where would you expect the unconditioned stimulus to be present?
- The unconditioned stimulus would be paired with the conditioned stimulus in initial trials on day 2.
  - The unconditioned stimulus would be paired with the conditioned stimulus in initial trials on day 3.
  - The unconditioned stimulus would be paired with the conditioned stimulus in initial trials on day 1.
  - The unconditioned stimulus would be paired with the conditioned stimulus on initial trials over the course of all three days.
13. Based on the saliva responses to stimuli shown in the graph, where would you expect the conditioned stimulus to be presented?
- The conditioned stimulus would be present only on day 1.
  - The conditioned stimulus would be present only on day 2.
  - The conditioned stimulus would be present only on day 3.
  - The conditioned stimulus would be present on trials over the course of all three days.

- 
14. In the study described in the passage, what is the major difference between the conditioned stimulus and the unconditioned stimulus?
- A. During conditioning trials the amount of saliva increases in response to the bell but decreases in response to the food.
  - B. During extinction the amount of saliva decreases in response to the food and in response to the bell.
  - C. Only the food elicits a response during conditioning.
  - D. Only the food elicits a response prior to conditioning.
15. The increase in response to the bell on the initial trials on days 2 and 3 is consistent with which concept?
- A. spontaneous recovery
  - B. the presence of the UCS
  - C. acquisition
  - D. extinction response

*Question 16 is not based on a passage.*

16. Anna misbehaves at school. The teacher places her in a 5-minute time-out during which she must sit quietly in a corner of the room. This is an example of which type of operant conditioning?
- A. positive reinforcement
  - B. positive punishment
  - C. negative reinforcement
  - D. negative punishment

*Questions 17–21 are based on the following passage.*

#### Passage IV

Sam is a 27-year-old man who is addicted to cocaine. The first time he tried it, he experienced elevated mood and energy. After a few times, he began to realize he needed increasing amounts of cocaine to get the same feeling. Eventually, he began to need to use it daily to feel “normal” and he would feel depressed on days he could not use it.

17. What symptoms is Sam likely to experience?
- A. Constricted pupils
  - B. Rapid heart rate
  - C. Increased rate of digestion
  - D. Release of bile

**108****UNIT II:  
Behavior**

- 
18. Cocaine increases the action potential of neurons. What is the name of this type of chemical?
- A. Agonist
  - B. Inhibitor
  - C. Neutral agonist
  - D. Inverse agonist
19. What is the primary neurotransmitter in the brain associated with cocaine addiction?
- A. Histamine
  - B. Serotonin
  - C. GABA
  - D. Dopamine
20. What physical system is primarily activated by taking cocaine?
- A. Parasympathetic system
  - B. Sympathetic system
  - C. Homeostatic system
  - D. Somatic nervous system
21. What is the estimated rate of drug addiction in the United States?
- A. 1%
  - B. 5%
  - C. 9%
  - D. 15%

**This is the end of the Unit II Minitest.**

---

## Unit II Minitest Answers and Explanations

1. **The correct answer is A.** The psychoanalytic theory is characterized by the interaction between the id (basic needs and wants), the ego (based on realistic expectations), and the superego (mediator of both the id and the ego).
2. **The correct answer is C.** Accidents were more likely during the early morning. The data collected show two peaks. The first is in the early morning hours. The second, smaller peak is during the late afternoon. However, the early morning peak is the most substantial peak.
3. **The correct answer is B.** The accident peaks would drift to the right on the graph with a slightly longer circadian cycle. In the absence of circadian cues, sleep research has shown that the human circadian cycle has been shown to drift toward 25 hours rather than 24. In this artificial case the main accident peak would continue to occur at the trough of the cycle and so would shift along with it.
4. **The correct answer is D.** Circadian timing is flexible but highly dependent on light, which will push the circadian cycle toward the daylight hours. Research suggests that exposure to light moves the circadian cycle toward the active daylight hours and is a cue that strongly influences behavior.
5. **The correct answer is D.** Hypothalamus—suprachiasmatic nucleus. The suprachiasmatic nucleus located in the hypothalamus is the brain structure that seems to readjust the biological clock based on light exposure. Because some retinal pathways bypass the occipital lobe and project light information directly to the suprachiasmatic nucleus, it is possible for some individuals who are blind but still have this pathway intact to have normal circadian rhythms that respond to light.
6. **The correct answer is A.** Individuals can experience an exacerbation of symptoms of existing medical conditions. Somatoform disorders are characterized by the experience of a medical condition that is exacerbated or alleviated by psychological conditions. They are often mistaken for factitious disorders, in which symptoms are intentionally created, or malingering, in which symptoms are reported but not experienced by the individual. True somatoform disorders are not intentional. Pain has multiple psychosocial factors that affect the pain experience, and all pain has a psychosomatic component to it.
7. **The correct answer is A.** The majority of participants (65%) obeyed the authority figure to the point that they administered what they believed were lethal shocks.
8. **The correct answer is A.** The participant teacher would typically obey the authority figure despite discomfort or pain exhibited by the learner. Most participants continued to administer shocks at the insistence of the authority figure until the shocks appeared to be potentially lethal.

## 110

UNIT II:  
Behavior

- 
9. **The correct answer is D.** The group discussion makes ethics more salient to the participant teachers, and the influence of the group is likely to polarize the individual toward increasing the importance of ethics through group think phenomena.
  10. **The correct answer is A.** In social psychology research, obedience represents compliance to direct commands from an authority figure.
  11. **The correct answer is C.** For such a small amount of money, Jack could not justify that he was doing the dishes for the money; therefore, cognitive dissonance theory indicates he will change his attitude about the chore. Cognitive dissonance results when there is a disconnect between an individual's actions and beliefs. When these are at odds, the individual will often change his or her attitudes or beliefs to bring them into line with his or her actions.
  12. **The correct answer is C.** The unconditioned stimulus would be paired with the conditioned stimulus in initial trials on day 1. The unconditioned stimulus is paired with the conditioned stimulus during learning trials. In the graph, the saliva is shown to increase only during trials in which the pairing is present (day 1; trials 2–16). The increase between days is typical of spontaneous recovery.
  13. **The correct answer is D.** The conditioned stimulus would be present on trials over the course of all three days. The conditioned stimulus would be paired with the unconditioned stimulus on initial trials on day 1 (during pairing/learning). It would also be present during the extinction and spontaneous recovery trials on the remaining day 1 trials as well as the trials over the next two days.
  14. **The correct answer is D.** Only the food elicits a response prior to conditioning. The food is the unconditioned stimulus and will elicit the saliva response without any conditioning. During trials, the bell is paired with the food and will elicit the conditioned response by itself in absence of the unconditioned stimulus. However, the response to the conditioned stimulus will drop over time without any new UCS-CS pairings.
  15. **The correct answer is A.** The increase is consistent with the concept of spontaneous recovery. This phenomenon has been noted in certain classical conditioning paradigms. It is characterized by the reappearance of an extinguished response after a period of nonexposure to the conditioned stimulus.
  16. **The correct answer is D.** Negative punishment is characterized by the removal of stimulus to reduce a behavior. In this case the misbehavior is being punished by the removal of social interaction.
  17. **The correct answer is B.** Cocaine activates the sympathetic nervous system which is part of the central nervous system that prepares the body for activity. Increased heart rate is a key component in preparing the body for activity.
  18. **The correct answer is A.** Any chemical that increases the action potential of neurons is an agonist. A chemical that reduces the action potential of the neurons is an inverse agonist.

- 
19. **The correct answer is D.** Dopamine is the primary neurotransmitter associated with addiction and reward. While other secondary neurotransmitters are involved, dopamine is the primary neurotransmitter in most substance and behavioral addictions.
20. **The correct answer is B.** The sympathetic system is half of the autonomic nervous system. It is the system that is responsible for energy expenditure and preparing the body for activity.
21. **The correct answer is C.** The estimated rate of drug addiction in the United States is 9%. The rate is higher when substance abuse and behavioral addictions are also included.

