Chapter Six
LEARNING

Review of Key Ideas

CLASSICAL CONDITIONING

1. Describe Pavlov's demonstration of classical conditioning and the key elements in this form of learning.

1-1. Classical conditioning is a type of learning that occurs when two stimuli are paired or associated closely in time. In Pavlov's initial demonstration, the two stimuli were a bell and _____.

1-2. The response to one of the two stimuli occurs naturally and does not have to be learned or acquired through conditioning. This "unlearned" stimulus, in this case the food, is technically known as the _____ stimulus.

1-3. The other stimulus is said to be neutral in the sense that it does not initially produce a response. When a response to this neutral stimulus is *acquired* or *learned*, the technical name for it is the _____ stimulus. In Pavlov's initial study the conditioned stimulus was the sound of a _____.

1-4. The unconditioned stimulus in Pavlov's original study was the _____ and the conditioned stimulus was the _____. Salivation to the meat powder is known as the _____ response; salivation to the bell is termed the _____ response.

1-5. Label the parts of the classical conditioning sequence. Place the commonly used abbreviations for these terms in the parentheses.

(a) meat: _____ ( )

(b) salivation to meat: _____ ( )

(c) bell: _____ ( )

(d) salivation to bell: _____ ( )

Answers: 1-1. meat powder (food) **1-2.** unconditioned **1-3.** conditioned, bell **1-4.** meat powder, bell, unconditioned, conditioned **1-5.** (a) unconditioned stimulus (UCS) (b) unconditioned response (UCR) (c) conditioned stimulus (CS) (d) conditioned response (CR).

2. Discuss how classical conditioning may shape phobias and physiological processes, including sexual arousal.

2-1. The kids in the neighborhood where I (R.S.) grew up used to dig tunnels in a neighbor's backyard. One day someone got stuck in the tunnel and couldn't get out. Eventually he got out, but after that he didn't want to play in tunnels again. To this day that person still has an intense fear not only of tunnels but of closed-in spaces in general. Label the parts of the classical conditioning process involved in the acquisition of the phobia of closed-in spaces. Use the abbreviations CS, CR, UCS, and UCR. (Hint: Even though "getting stuck" involves a behavior or response, it also has stimulus components.)

_____ getting stuck

_____ fear produced by getting stuck

_____ tunnels and closed-in spaces

_____ fear of tunnels and closed-in spaces

2-2. The individual described above had developed an intense fear or phobia, acquired in part through the process of _____ conditioning. Other emotions can be conditioned as well. For example, the smell of smoke and Beemans' gum described in your text, the playing of "our song," and the sight of one's home after a long absence could all produce a pleasant emotional response (or perhaps a slightly weepy, sentimental feeling). The emotional responses to such smells, sounds, or sights are learned, so the stimuli that produce these responses would be considered _____ stimuli.

2-3. Similarly, certain physiological responses can be conditioned. Label the parts of the conditioning process in the study on immunosuppression in rats described in the text. (Use the abbreviations CS, CR, UCS, and UCR.)

_____ the immunosuppressive drug

_____ unusual taste

_____ decreased antibody production produced by the drug

_____ decreased antibody production produced by the taste

2-4. Sexual arousal can be classically conditioned as well. In quail as in humans, stimuli routinely paired with sex (e.g., red lights in the quail study; lingerie, mood music, etc. in humans) evidently become _____ stimuli for sexual arousal.

2-5. In one variation of Domjan's studies with quail the conditioned stimuli even produced an increased release of _____ in males, a conditioned response with a clear evolutionary advantage. One implication of this study for evolutionary theory, then, is that the capacity for classical conditioning, in this case conditioning of sexual arousal, has _____ value for a species.

Answers: 2-1. UCS, UCR, CS, CR **2-2.** classical, conditioned **2-3.** UCS, CS, UCR, CR **2-4.** conditioned **2-5.** sperm, survival (adaptive).

3. Describe the classical conditioning phenomena of acquisition, extinction, and spontaneous recovery.

3-1. *Acquisition* of a conditioned response occurs when the CS and UCS are contiguous, or paired. Not all pairings result in conditioning, however. What characteristics of a CS are more likely to produce acquisition of a CR?

3-2. Acquisition refers to the formation of a conditioned response. What is the term that refers to the weakening or disappearance of a CR? _____

3-3. Extinction in classical conditioning occurs when the _____ stimulus is presented *alone*, without the _____ stimulus.

3-4. After CRs are extinguished they may reappear, even without further conditioning.

(a) For example, after extinction of a response, a dog may again show the conditioned response (e.g., salivation to a bell) when returned to the apparatus in which it was originally conditioned. What is the name of this type of "reappearance" of the CR? _____ _____

(b) When, or under what circumstance, is spontaneous recovery likely to occur?

(c) If an animal is extinguished in a different environment from the one in which conditioning took place, it is likely to again show a CR when returned to the original environment. What is the name of this effect? _____ _____

Answers: 3-1. A novel or particularly intense CS is more likely to produce conditioning. **3-2.** extinction **3-3.** conditioned, unconditioned **3-4.** (a) spontaneous recovery (b) after extinction, following a period of nonexposure to the CS (c) the renewal effect.

4. Describe the processes of generalization and discrimination and summarize the classic study of Little Albert.

4-1. With regard to the case of Little Albert:

(a) What was the CS?

(b) The UCS?

4-2. Albert was also afraid of white dogs and white rabbits. What is the name of the process that resulted in his acquisition of these additional fear responses? _____

4-3. Why would Albert be more likely to develop a fear of a white rabbit, say, than a white car or a dark horse?

4-4. The more similar stimuli are to the CS, the more likely the organism will _____ from the CS to the other stimuli. The less similar stimuli are to the CS, the more likely the organism is to _____ them from the CS.

4-5. Casey (R.S.'s cat, now deceased) salivated when she heard the sound of food being dumped into her bowl. The process by which this salivary response was learned is _____ conditioning. The food is a(an) (CS/UCS/CR/UCR). The sound of the food is a(an) (CS/UCS/CR/UCR). Salivation to the sound is a(an) (CS/UCS/CR/UCR).

4-6. Pets are also likely to salivate when they hear other, similar sounds, like bags rustling in the kitchen or dishes being pulled from the cupboard. Salivation to these other sounds represents stimulus _____.

4-7. With continued training, in which food is paired only with the sound of food entering the bowl and not with the other sounds, the animal will learn to salivate only to the rattling bowl. The process of learning to respond only to one particular stimulus and not to a range of similar stimuli is termed _____.

Answers: 4-1. (a) a white rat (b) a loud noise **4-2.** generalization **4-3.** Because of similarity. The more similar the other stimuli to the CS, the more likely generalization is to occur. **4-4.** generalize, discriminate **4-5.** classical, UCS, CS, CR **4-6.** generalization **4-7.** discrimination.

5. Explain what happens in higher-order conditioning.

5-1. Suppose that a *bell* and *meat powder* are paired, as in the original Pavlovian study. At some point a conditioned salivary response will occur to the bell. Suppose that in a new series of trials a *clicking sound* (a new, neutral stimulus) is paired with the bell. Assuming that the stimuli are potent enough, that the timing is right, and so on, a _____ response will occur to the clicking sound.

5-2. This process, in which a stimulus that previously functioned as a "learned" or *conditioned* stimulus is used as an *unconditioned* stimulus, is known as _____ conditioning.

5-3. In our example, in which the clicking sound and bell were paired, which stimulus acted as the UCS? _____

Answers: 5-1. conditioned **5-2.** higher-order **5-3.** the bell.

OPERANT CONDITIONING

6. Discuss the nature of operant responding in comparison to the types of responding typically governed by classical conditioning.

6-1. A major feature of Pavlovian or classical conditioning is that conditioned responses occur when two stimuli are paired or associated. For example, when a sound and food are paired together, a conditioned salivary response occurs to the _____.

6-2. In contrast, in operant conditioning, learning or conditioning occurs from stimuli that (precede/follow) the response, the stimuli that are the "payoff" or _____ of that particular behavior.

6-3. Learning theorists originally supposed that the two types of conditioning controlled different types of responses, that classical conditioning controlled reflexive or (voluntary/involuntary) responses (such as salivation or leg flexion) while operant conditioning controlled voluntary responses. While this distinction holds up (all of the time/much of the time), it is now clear that the only absolute distinction is in terms of procedure.

Answers: 6-1. sound **6-2.** follow, reinforcers (consequence) **6-3.** involuntary, much of the time.

7. Describe Thorndike's work and explain his law of effect.

7-1. E. L. Thorndike's pioneering work on what he referred to as _____ learning provided the foundation for Skinner's _____ conditioning.

7-2. According to Thorndike's law of _____, if a response leads to a *satisfying effect* in the presence of a stimulus, the association between the stimulus and response is strengthened. Thorndike's law of effect is similar to Skinner's concept of reinforcement: both emphasize the _____ of behavior.

Answers: 7-1. instrumental, operant **7-2.** effect, consequences.

8. Describe Skinner's principle of reinforcement and the prototype experimental procedures used in studies of operant conditioning.

8-1. A reinforcer is a stimulus or event that (1) is presented *after* a response and that (2) increases the tendency for the response to be repeated. Apply that definition to this example: Grundoon, a captive monkey, occasionally swings on a bar in his cage. Suppose that at some point Grundoon's trainers decide to give him a spoonful of applesauce whenever he swings. Is the applesauce a reinforcer? In terms of the definition above, how do you know that applesauce is a reinforcer?

8-2. The trainers switch to vinegar. Grundoon, an unusual primate, swings quite frequently when this behavior is followed by vinegar. Is vinegar a reinforcer here? How do you know?

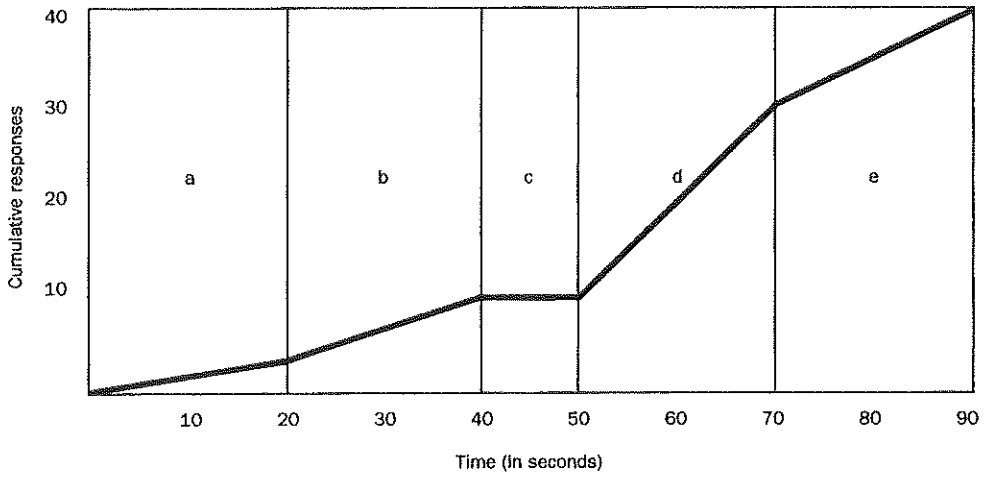
8-3. The trainers try another approach. They present Grundoon with fresh fruit *just before* they think he is likely to jump. It so happens that Grundoon's rate of jumping does increase. Is the fruit a reinforcer here? Why or why not?

8-4. The prototypic apparatus used in operant conditioning studies is the operant chamber, better known as the _____. On one wall of the chamber is mounted a manipulandum, a device that makes for an easily discernible response. For rats, the manipulandum is usually a small _____; for pigeons, the device is a _____ that the bird learns to peck.

8-5. A press of the lever or peck at the disk may produce a reinforcer, generally a small bit of food dispensed into the food cup mounted to one side or below the manipulandum. Each of these responses is recorded on a _____ _____, a device that creates a graphic record of the number of responses per unit time.

8-6. The cumulative recorder records the *rate* of the behavior, that is, the number of _____ made per unit _____.

8-7. Below is a highly stylized version of a cumulative record. About how many responses were made during the first 40 seconds? _____ Which section of the graph (a, b, c, d, or e) has the steepest slope? _____ Which section of the graph illustrates the fastest rate of responding? _____ About how many responses were made between the 40th and 70th seconds? _____



Answers: 8-1. Yes. If the animal's rate of swinging increases when followed by applesauce, then applesauce is a reinforcer. **8-2.** Yes. Because the vinegar is presented *after the response*, and because the *response rate increases.* (Note that this is an imaginary example to illustrate the point that reinforcement is not defined in terms of "pleasantness" and "unpleasantness," which are unobservable subjective judgments. Instead, reinforcement is defined in terms of *strengthening* of a response tendency *by the events that follow* the responses. I don't know of any monkeys that will respond for vinegar. I doubt that there are any.) **8-3.** No. Reinforcing stimuli, by definition, *follow* the response. (Again, this is a contrived example just to illustrate the definition.) **8-4.** Skinner box, lever (or bar), disk **8-5.** cumulative recorder **8-6.** responses, time **8-7.** 10, d, d, 20.

9. Describe the operant conditioning phenomena of acquisition, shaping, and extinction.

9-1. Acquisition refers to the formation of new responses. In classical conditioning, acquisition occurs through a simple pairing of the CS and UCS. In operant conditioning, acquisition usually involves the procedure known as _____.

9-2. What is shaping? When is it used?

9-3. Extinction in classical conditioning involves removing the UCS while still presenting the CS.

(a) What is the extinction procedure in operant conditioning?

(b) What is the effect of extinction on behavior (response rate)?

(c) What does the term *resistance to extinction* mean?

Answers: 9-1. shaping **9-2.** Shaping is the process of reinforcing closer and closer approximations to the desired behavior. It is used in the formation of a new response. **9-3.** (a) No longer presenting the reinforcers after a response. (b) Response rate decreases and may eventually stop. (c) Animals may continue to respond, for a period of time, even when reinforcers are no longer presented. The extent to which they will *continue to respond during extinction* is referred to as *resistance* to extinction.

10. Explain how stimuli govern operant behavior and how generalization and discrimination occur in operant conditioning.

10-1. Suppose that a rat has been shaped so that when it presses a lever it receives a food pellet. With further training, the rat may respond only when a light (or sound, etc.) in the chamber is on and not when it is off. The food pellet (which follows the response) is a _____. The light (which precedes the response) is a _____ stimulus.

10-2. Reinforcers occur (after/before) the response occurs. Discriminative stimuli occur _____ the response occurs.

10-3. To create a discriminative stimulus, one reinforces a response only in the presence of a particular stimulus and not in its absence. In time that stimulus will gain control of the response: Animals will tend to emit the response only if the discriminative stimulus is (present/absent) and not if it is _____.

10-4. For example, rats can be trained to press a lever when a light comes on and not to press when the light is off. Lever presses that occur when the light is on are followed by a food pellet; those that occur in the dark are not. Label each component of this operant-conditioning process by placing the appropriate letters in the blanks below.

_____ light	a. discriminative stimulus
_____ lever press	b. response
_____ food	c. reinforcer

10-5. "Heel Fido!" says Ralph. Fido runs to Ralph's side. Fido gets a pat on the head. Label the parts of the operant conditioning sequence by placing the appropriate letters in the blanks. (To avoid confusion, the behavior or response of interest in this example is already labeled.)

_____ "Heel Fido!"	a. discriminative stimulus
_____ Fido gets a pat on the head.	b. response
__b__ Fido runs to Ralph's side.	c. reinforcer

10-6. Phyllis will lend money to Ralph, but only after Ralph promises to pay her back. Ralph is also careful to thank Phyllis for her help. The behavior we are looking at here is Phyllis's lending behavior.

_____ "Thank you very much, Phyllis."	a. discriminative stimulus
__b__ Phyllis lends.	b. response
_____ "I promise I'll pay you back."	c. reinforcer

10-7. Generalization occurs in operant as well as classical conditioning. For example, when I put dishes in the sink, our cat would *run to her bowl* looking for food. In technical terms, our cat _____ between the sound of food dropping in her bowl and the *similar* sound of dishes going into the sink. Despite the fact that food does not follow the sound of clattering dishes, our cat did *not* learn to _____ between the sounds in our kitchen.

Answers: 10-1. reinforcer, discriminative **10-2.** after, before **10-3.** present, absent **10-4.** a, b, c **10-5.** a, c, (b) **10-6.** c, (b), a **10-7.** generalizes, discriminate.

11. Distinguish between primary and secondary reinforcers.

11-1. Define the following:

(a) Primary reinforcer:

(b) Secondary or conditioned reinforcer:

Answers: 11-1. (a) A primary reinforcer satisfies biological needs, such as needs for food, water, warmth and sex. (b) A secondary, or conditioned, reinforcer is one that is learned or acquired through *association* with a primary reinforcer. For humans, secondary reinforcers may include praise, attention, and money.

12. Identify various types of schedules of reinforcement and discuss their typical effects on responding.

12-1. Schedules of reinforcement are either continuous or intermittent. If reinforcers follow each response, the schedule is referred to as a/an _____-reinforcement schedule, abbreviated CRF. If reinforcers only follow some responses and not others (e.g., FR, VR), or occur as a function of the passage of time (e.g., FI, VI), the schedule is referred to as a/an _____ schedule.

12-2. Identify the following schedules of reinforcement by placing the appropriate abbreviations in the blanks: continuous reinforcement (CRF), fixed ratio (FR), variable ratio (VR), fixed interval (FI), variable interval (VI).

____ A pigeon is reinforced whenever it has pecked a disk exactly 20 times.

____ A pigeon is reinforced for pecking a disk, on the average, 20 times.

____ A rat is always reinforced for the first response that follows a two-minute interval.

____ A slot machine delivers a payoff, on the average, after every 10th pull of the lever.

____ Every time the pigeon pecks a disk, it receives a pellet of food.

____ A rat is reinforced, on the average, for the first response following a two-minute interval.

____ A pig is reinforced for the first response after 30 seconds, then for the first response after 42 seconds, then for the first response after five seconds, and so on.

____ Every two weeks Ralph picks up his payroll check at the office.

____ A rat is reinforced after the 73rd response, then after the 22nd response, then after the 51st response, and so on.

12-3. Resistance to extinction refers to the extent to which responses occur during a period of extinction. What is the general effect of the intermittent schedules of reinforcement on resistance to extinction?

12-4. In terms of the effect on *rate* of responding, what is the general difference between the *ratio* schedules (FR and VR) and the *interval* schedules (FI and VI)?

12-5. In terms of the effect on *pattern* of responding, what is the general difference between *fixed* schedules and *variable* schedules?

Answers: 12-1. continuous, intermittent (or partial) **12-2.** FR, VR, FI, VR, CRF, VI, VI, FI, VR **12-3.** The intermittent schedules increase resistance to extinction. **12-4.** Ratio schedules tend to produce more rapid responding than the interval schedules. **12-5.** Variable schedules tend to produce more regular patterns of responding, without pauses or scalloping, than do their fixed counterparts. They also result in more resistance to extinction.

13. Explain the distinction between positive and negative reinforcement.

13-1. Some Skinner boxes may be set up so that a mild electric shock can be delivered to the feet of the animal through the floor of the box. Suppose that whenever the animal presses the bar, the shock is turned *off* for a period of time. Will the lever-pressing behavior be *strengthened* or *weakened*? _____

13-2. By definition, what effect does reinforcement have on behavior? What is the effect of positive reinforcement on behavior? Negative reinforcement?

13-3. With positive reinforcement, a stimulus is *presented* after the response. What is the procedure with negative reinforcement?

Answers: 13-1. strengthened **13-2.** Reinforcement strengthens (increases the frequency of) behavior. Both positive and negative reinforcement strengthen behavior. **13-3.** The stimulus (an aversive stimulus) is *removed* after the response.

14. Describe and distinguish between escape learning and avoidance learning.

14-1. Review the section on escape and avoidance learning. In escape learning the animal first experiences the aversive stimulus and then makes a response that escapes it. In avoidance learning the animal responds to a cue that permits it to respond *before* the aversive stimulus is delivered, thereby avoiding it altogether. Label the following examples E for escape and A for avoidance.

____ The weather has changed and Fred is getting cold. He goes inside.

____ Little Sandra rapidly removes her hand from the hot stove.

____ A cue light comes on in the dog's shuttle box. It jumps the hurdle to the other side.

____ Randolph has been told that he will be mugged if he goes outside, so he stays inside.

____ Sue has learned some new verbal behavior. If she simply says, "No, I don't want that" shortly after a salesman starts his pitch, the salesman will stop bothering her.

____ Alice sees Ruppert in the distance. If Ruppert sees her he will ask for her course notes, which she doesn't want to lend him. She heads in the other direction.

14-2. What is the major difference between escape learning and avoidance learning?

Answers: 14-1. E, E, A, A, E, A **14-2.** The major difference is that with escape learning there is no cue stimulus, so that the animal must first experience the aversive stimulus and then *escape* it. In the case of avoidance learning, a cue preceding the aversive stimulus permits the animal to *avoid* the aversive event altogether.

15. Describe punishment and its effects.

15-1. Punishment involves *weakening* a response by presenting an aversive stimulus after the response has occurred. Review the concepts of reinforcement and punishment by labeling each of the following with one of these terms: *positive reinforcement, negative reinforcement,* or *punishment.*

(a) A stimulus is *presented* after the response; response rate *increases:* _____

(b) A stimulus is *presented* after the response; response rate *decreases*: _____

(c) A stimulus is *removed* after the response; response rate *increases*: _____

15-2. Response rate *increases*. Which of the following procedures may have been used?

a. positive reinforcement
b. negative reinforcement
c. punishment
d. either a or b above

15-3. Response rate *decreases*. Which of the following procedures may have been used?

a. positive reinforcement
b. negative reinforcement
c. punishment
d. either *b* or *c* above

15-4. When a rat presses a bar in an operant chamber, the electric shock stops. Bar pressing increases. What procedure has been used?

a. positive reinforcement
b. negative reinforcement
c. punishment
d. extinction

15-5. When the dog ran after the car, his master immediately threw a bucket of water on him. This sequence of events was repeated only twice, and the dog stopped running after the car. What has occurred?

a. positive reinforcement

b. negative reinforcement

c. punishment

d. extinction

15-6. When Randolph stepped out in his new outfit, everyone stared. If Randolph tends *not* to wear this outfit in the future, what has occurred?

a. positive reinforcement

b. negative reinforcement

c. punishment

d. extinction

15-7. In the space below list three negative side effects of punishment.

Answers: 15-1. (a) positive reinforcement (b) punishment (c) negative reinforcement **15-2.** d, because if response rate increases, *either* positive *or* negative reinforcement may be involved **15-3.** c. Not d, because negative reinforcement *increases* response rate. **15-4.** b **15-5.** c **15-6.** c **15-7.** Punishment may (1) suppress responses in general rather than just the response punished, (2) produce unwanted emotional responses, including fear and anger, and (3) increase aggressive behavior.

16. Discuss research on the side effects of punishment as a disciplinary procedure.

16-1. A recent comprehensive review of research on punishment of children concluded that (physical punishment/time out) is associated with increased aggression and, in adulthood, criminal and other undesirable behaviors.

16-2. Critics have raised questions about these conclusions. For example, it is possible that punishment does not cause aggression in children but that aggression in children causes them to be punished. The studies are, after all, (experimental/correlational), so cause-effect conclusions are difficult to make.

16-3. Critics also point out that the review (did/did not) distinguish between occasional mild physical punishment and harsh abusive punishment. Experts are unanimously opposed to harsh physical punishment, but judicious use of occasional mild spanking (is known to/may not) have negative effects.

16-4. The text suggests the following guidelines for use of punishment: (a) Apply punishment (immediately/after a delay). (b) Use a level of punishment that is the (most/least) severe to be effective. (c) When administering punishment (explain/do not explain) why it is being given. (e) In general, when employing punishment try to use (physical punishment/withdrawal of privileges).

Answers: 16-1. physical punishment **16-2.** correlational **16-3.** did not, may not **16-4.** (a) immediately (b) least (c) explain (d) withdrawal of privileges.

17. Discuss the phenomena of instinctive drift and conditioned taste aversion.

17-1. What is instinctive drift?

17-2. Why was the occurrence of instinctive drift surprising to operant psychologists? Discuss this question in terms of the supposed *generality* of the laws of learning.

17-3. What is conditioned taste aversion?

17-4. Why is the occurrence of conditioned taste aversion surprising? Discuss this question in terms of classical conditioning relating to (1) CS-UCS delays and (2) the sense of taste compared with other senses.

Answers: 17-1. It is the tendency for instinctive or innate behavior to interfere with the process of conditioning. **17-2.** Before the 1960s, operant psychologists assumed that any response that animals could emit could readily be conditioned. This did not turn out to be true. Animals may exhibit instinctive drift, the tendency to respond with certain innate behaviors that actually interfere with the process of conditioning. **17-3.** It refers to the somewhat unusual conditioning involving taste and nausea. If the distinctive taste of a particular food is followed some hours later by sickness (nausea, vomiting, etc.), that taste will become aversive and will itself come to elicit the response of nausea. **17-4.** It is surprising because (1) classical conditioning generally does not occur if there are long CS-UCS delays, and (2) taste is only one of several senses stimulated in this situation. Garcia concluded that the tendency for animals to fairly easily associate taste (as opposed to sight, sound, etc.) with sickness has survival value for a species in that it helps them avoid poisonous food in the future.

18. Explain Domjan's ideas on the importance of ecologically relevant conditioned stimuli and discuss the evolutionary perspective on learning.

18-1. Domjan (2005) proposes that taste aversion is not a unique phenomenon but represents the rapid conditioning that may occur when the CS is (neutral/ecologically relevant) with regard to the UCS. Such a CS-UCS relationship generally occurs in (the laboratory/natural environment).

18-2. In a traditional laboratory conditioning experiment, the CS is an arbitrary or _____ stimulus. For example, a tone or clicking sound may be artificially paired with food. In the natural environment, the CS is not "neutral" but is generally _____ relevant to the UCS. For example, in the natural environment food is not preceded by a bell but by specific smells or tastes; copulation by specific mating signals; danger from animals by specific sounds or smells, etc.

18-3. For Domjan species-specific differences in conditioning are the norm rather than the exception, and he urges researchers to shift their focus from the study of neutral to ecologically relevant CS-UCS pairings. When more naturally related CS-UCS associations are used, several differences are likely to occur: conditioning may occur (more/less) rapidly, may be more resistant to extinction, etc.

18-4. While most learning psychologists currently agree that differing evolutionary demands have produced differences in conditioning across species, they still maintain that there are highly general or _____ laws of learning. Taking a more radical view, some evolutionary psychologists propose that learning in different species has evolved along different paths; they assert that there (are/are not) universal principles of learning.

Answers: 18-1. ecologically relevant, natural environment **18-2.** neutral, ecologically **18-3.** more **18-4.** universal, are not.

19. Describe research on latent learning, signal relations, and response-outcome relations, and explain their theoretical importance.

19-1. Is reinforcement really needed for learning, as traditional learning theorists have contended? In the 1940s Edward C. Tolman, an early dissenter from conventional learning theory, found that rats allowed to wander a complicated maze without reinforcement learned to get to the goal box rapidly once food was presented. In fact, they learned as rapidly as another group of rats reinforced on every trial. What does this prove? First, rats appeared to learn the complicated series of left and right turns without _____; second, they appeared to learn something about the layout of the maze, what Tolman termed a _____ map.

19-2. Tolman referred to this type of learning as _____ learning. Latent learning is not apparent from behavior when it first occurs, but it appears later if the incentive is present. Tolman was prophetic, in a sense, well ahead of his time. His views were rejected by mainstream theorists for the next several decades but, as this chapter makes clear, current models of conditioning (include/do not include) cognition as a factor in conditioning.

19-3. In the example of a signal relations study described, the number of conditioning trials in which CS and UCS were paired was the same for two groups, 20 trials. The difference between the two treatment groups was that for one group the (CS/UCS) was presented *alone* for an additional series of 20 trials.

19-4. Theorists originally assumed that classical conditioning is an automatic, reflexive phenomenon that does not depend at all on higher mental processes. If that actually were true, then what should have been the effect of presenting the UCS alone for additional trials? Remember that both groups received exactly the same number of conditioning trials (CS-UCS pairings).

a. Extinction would occur.

b. The UCS-alone trials would weaken conditioning.

c. The UCS-alone trials would have no effect on conditioning.

19-5. In fact, what did occur in the signal relations studies?

a. Extinction.

b. The UCS-alone trials weakened conditioning.

c. The UCS-alone trials had no effect on conditioning.

19-6. These results suggest that the CS *signals* the occurrence of the UCS and that additional trials with the UCS alone weaken the _____ value of the CS. What is surprising about these results? Rather than being an automatic, mechanical process, these studies suggest that classical conditioning involves _____ processes.

19-7. Response-outcome relations refers to the connection between an operant response and its consequences. For example, for a rat in a Skinner box the relationship between the lever press (the response) and the food pellet (the outcome) is this: the rat gets the food *only if* it presses the lever. In other words, the reinforcer is (contingent/not contingent) on the response.

19-8. But does the animal "know" the connection between the response and reinforcer, or is the connection stamped in automatically? That is the crux of the response-outcome relations issue. Evidence suggests that

a. reinforcement and punishment are relatively automatic, mindless processes.
b. cognition is not involved in an organism's responding in an operant chamber.
c. humans and other animals actively try to figure out the contingencies, the relationship between response and outcome.

19-9. Thus, research on signal relations and response-outcome relations has forced the development of new theories that emphasize a much more _____ explanation of conditioning, an explanation in which organisms actively attempt to detect the *relationship* between their behaviors and environmental events.

19-10. Why are the latent learning, signal relations (in classical conditioning) and response-outcome relations (in operant conditioning) studies surprising and of theoretical importance?

Answers: 19-1. reinforcement, cognitive **19-2.** latent, include **19-3.** UCS! (If the CS were presented alone, it would be extinction.) **19-4.** c **19-5.** b **19-6.** signaling, cognitive (higher mental) **19-7.** contingent **19-8.** c **19-9.** cognitive **19-10.** These studies indicate that conditioning is not, as assumed earlier, an automatic process but instead depends to a considerable degree on higher mental (cognitive) processes.

OBSERVATIONAL LEARNING

20. Discuss the nature and importance of observational learning.

20-1. Observational learning occurs when an organism learns by observing others, who are called _____. This type of learning occurs in (humans/animals/both).

20-2. Why is the concept of observational learning so important? For one thing the idea was surprising to theorists who assumed that all learning could be accounted for by operant and classical conditioning. For another, it extends classical and operant conditioning to include not only *direct* experience but _____ or vicarious experience. We learn not only when we behave but when we _____ the behavior of others.

20-3. Bandura's theory has helped explain some puzzling aspects of conditioning in human behavior. For example, what happens when parents punish aggressive behavior in their children? While punishment by definition (increases/decreases) the behavior it follows, a parent using punishment also serves as a _____ for aggressiveness. In this way events intended to decrease aggression may, in the longer run, _____ aggression through the process of _____ learning.

Answers: 20-1. models, both **20-2.** indirect, observe **20-3.** decreases, model, increase, observational.

21. List the basic processes in observational learning and discuss Bandura's view on whether reinforcement affects learning or performance.

21-1. In the space below list and define the four processes that Bandura has identified as crucial components of observational learning. The first letter of each concept is listed at the left.

A_____:

R_____:

R_____:

M_____:

21-2. Bandura asked the question that Tolman asked decades earlier: Is reinforcement essential for learning? Many learning theorists used to think so, but in Bandura's view reinforcement is essential only for (learning/performance). Bandura asserts that we may learn without being reinforced simply by _____ the behavior of a model, but we are unlikely to perform the response unless we are _____ for doing so.

Answers: 21-1. Attention: Paying attention to a model's behavior and consequences. Retention: Retaining in memory a mental representation of what one has observed. Reproduction: Having the ability to reproduce what one sees, to convert the image to behavior. Motivation: Having the inclination, based on one's assessment of the likely payoff, to reproduce the observed behavior. **21-2.** performance, observing, reinforced.

22. Discuss research on observational learning as it relates to the controversy about the effects of media violence.

22-1. Young children are exposed to an enormous amount of violence on T.V. Does televised violence increase the likelihood that they will engage in aggressive acts? Is it a *causal* factor in aggression? In hundreds of experimental laboratory studies, the answer is clearly (yes/no/maybe). Individuals exposed to media violence, even for short periods of time in a laboratory setting, are both verbally and physically more _____ immediately after the exposure.

22-2. What are the longer-term effects? In the real world, several studies have found that the more violence children watch on television, the more aggressive they are at home and at school. These are _____ studies, not experiments, and the opposite causal relationship could be inferred: children who are violent in the first place may like to watch violent T.V.

22-3. There is, however, particularly convincing evidence in long-term studies of the same individuals: the more televised violence individuals watch as children, the more likely they are to be _____ as adolescents and young adults. Since media aggression (follows/precedes) the aggressive behavior that occurs much later, these studies, when considered with the laboratory experiments, make alternative explanations unlikely.

22-4. Thus, watching televised violence seems to cause aggressive behavior. Since most of us have been exposed to media violence, why aren't we all violent? The reason is that aggression is influenced by a (few/large number) of factors, so the resulting increase may be relatively modest. Still, a modest effect multiplied by millions of people can have big repercussions.

Answers: 22-1. yes, aggressive **22-2.** correlational **22-3.** aggressive (violent), precedes **22-4.** large number.

REFLECTING ON THE CHAPTER'S THEMES

23. Explain how the chapter highlighted two of the text's unifying themes.

23-1. Skinner's view is that behavior is in large part determined by the environment. One of our unifying themes, however, is that environment doesn't act alone – environment _____ with heredity. What two phenomena discussed in the chapter illustrate the powerful effect that biology has on conditioning? _____ and _____

23-2. The second theme well illustrated in this chapter is that psychology evolves in a sociohistorical context. Skinner's _____ psychology, for example, with its emphasis on _____ reinforcement, has clearly influenced trends in education, child rearing, and management styles in business.

Answers: 23-1. interacts, instinctive drift, conditioned taste aversion **23-2.** operant, positive.

PERSONAL APPLICATION • ACHIEVING SELF-CONTROL THROUGH BEHAVIOR MODIFICATION

24. Describe how to specify your target behavior and gather baseline data for a self-modification program.

24-1. What behavior do you want to change? The question sounds simple, but the task of defining a _____ behavior is frequently quite tricky.

24-2. The behavior that you select must be defined in terms of observable events so that you will know if and when it changes. For example, for the problem of anger control, which of the following would be the most *directly observable* definition of "anger"?

a. inner turmoil

b. intense hostility

c. loud voice and clenched fists

24-3. Once you specify the target behavior you must gather _____ data on your behavior prior to the intervention. At this time you should also keep track of events that precede the target behavior, the _____ events, and also the positive and negative reinforcers that follow it, the _____ of your behavior.

Answers: 24-1. target (specific) **24-2.** c, although even those behaviors would have to be further described in a behavior modification program. Alternative a is not really observable. Alternative b could be behaviorally defined, but as it stands it is hard to know precisely which behaviors intense hostility refers to. **24-3.** baseline, antecedent, consequences.

25. Discuss how to design, execute, evaluate, and end a self-modification program.

25-1. To increase a target behavior you would use _____. The reinforcer (can/can not) be something that you already are receiving. For example, you probably already watch TV, go to movies, or buy things for yourself, so you could make one of these events _____ on an increased frequency of the target behavior.

25-2. You would specify exactly what behavioral goals must be met before you receive the reinforcer; that is, you would arrange the _____. If your goal is to increase studying, you might specify that TV watching for one hour is _____ on having studied for two hours.

25-3. Or, you might specify that for each hour you studied you would earn points that could be "spent" for watching TV, or going to movies, or talking with friends, and so on. This type of arrangement is referred to as a _____ economy.

25-4. A fairly obvious way to decrease a target behavior is to use _____. The problem with this approach is that it is difficult to follow through with self-punishment. So, there are two guidelines to keep in mind when using punishment in a self-control program: (1) Use punishment only in conjunction with _____ reinforcement; and (2) use a relatively _____ punishment that you, or perhaps a third party, will be able to administer.

25-5. It is also possible to use reinforcement to decrease behavior. For example, if you want to gradually reduce the amount that you smoke, you could reinforce yourself whenever you smoke fewer than a particular number of cigarettes per day. Paradoxically, you are using _____ to decrease behavior.

25-6. For some situations you may be able to identify events that reliably precede the behaviors you are trying to stop. For example, for some people smoking is at least under partial control of certain types of social events. So, one strategy for decreasing a behavior is to identify, and then avoid, the (antecedent/consequent) events that may control the behavior.

25-7. Successful execution of the program depends on several factors. To avoid cheating try creating a formal written behavioral _____. Or, make an arrangement so that (only you/someone else) delivers the reinforcers and punishments.

25-8. If your program isn't working, some small revision may turn it around. Try increasing the strength of the reinforcer or else try _____ the delay between the behavior and delivery of the reinforcer.

25-9. It is generally a good idea to specify in advance the conditions under which you would end the program. You may wish to phase it out by having a/an (gradual/immediate) reduction in the frequency or potency of reinforcers, although for some successful programs the new behaviors become self-maintaining on their own.

Answers: 25-1. reinforcement, can, contingent **25-2.** contingency, contingent **25-3.** token **25-4.** punishment, positive, mild **25-5.** reinforcement **25-6.** antecedent **25-7.** contract (agreement), someone else **25-8.** decreasing **25-9.** gradual.

CRITICAL THINKING APPLICATION • MANIPULATING EMOTIONS: PAVLOV AND PERSUASION

26. Describe how classical conditioning is used to manipulate emotions.

26-1. It is easy to forget that Pavlovian conditioning involves more than salivating dogs. It involves emotion and in that respect is important for a range of reactions—from phobias to sexual arousal to the effects of advertising. Manipulation employs a special subtype of classical conditioning in which the elicited responses are emotion-laden likes and dislikes. This type of conditioning, known as _____ conditioning, is especially resistant to extinction.

26-2. For practice with classical conditioning concepts, especially as they relate to evaluative conditioning, label each of the following:

(a) A glamorous woman is shown entering an automobile. Label each of the following with CS, UCS, CR, and UCR. (Assume, for the sake of this example, that the target audience is initially more attracted to the woman than the car. It could work the other way, too.)

_____ the woman

_____ the car

_____ attraction to the car

_____ attraction to the woman

(b) A politician stands in front of an American flag.

What is the CS? _____

The UCS? _____

(c) A salesman takes you to lunch.

What is the CS? _____

The UCS? _____

The CR? _____

26-3. Of course, there's more going on in these examples than just classical conditioning. When we receive a favor, we are not only being conditioned, but may feel obliged to pay back or _____ the person's favor.

26-4. While the examples we've used involve liking or attraction, other emotions may be conditioned as well—such as feelings of masculinity and femininity. Want to be more masculine? Smoke these cigarettes, ads may suggest. Not that we must be conscious of manipulation attempts, for conditioning (does/<u>does not</u>) seem to require our awareness.

26-5. How do we protect ourselves against attempts to manipulate our emotions? One suggestion from research on persuasion is that merely being _____ of the pervasiveness of conditioning will by itself provide some protections against manipulation strategies.

Answers: 26-1. evaluative **26-2.** (a) UCS, CS, CR, UCR (b) the politician, the flag (c) the salesman (or his product), the lunch, liking for the salesman (or his product) **26-3.** reciprocate **26-4.** does not **26-5.** forewarned (aware).

Review of Key Terms

Acquisition
Antecedents
Avoidance learning
Behavior modification
Behavioral contract
Classical conditioning
Concurrent schedules of reinforcement
Conditioned reinforcers
Fixed-ratio (FR) schedule
Higher-order conditioning
Instinctive drift
Instrumental learning
Intermittent reinforcement
Latent learning
Law of effect
Learning
Primary reinforcers
Punishment
Reinforcement
Reinforcement contingencies
Resistance to extinction
Schedule of reinforcement
Secondary reinforcers
Shaping

Conditioned response (CR)
Conditioned stimulus (CS)
Continuous reinforcement
Cumulative recorder
Discriminative stimuli
Elicit
Emit
Escape learning
Evaluative conditioning
Extinction
Fixed-interval (FI) schedule
Matching law
Negative reinforcement
Observational learning
Operant chamber
Operant conditioning
Optimal foraging theory
Partial reinforcement
Pavlovian conditioning
Phobias
Positive reinforcement
Preparedness
Skinner box
Spontaneous recovery
Stimulus discrimination
Stimulus generalization
Token economy
Trial
Unconditioned response (UCR)
Unconditioned stimulus (UCS)
Variable-interval (VI) schedule
Variable-ratio (VR) schedule

_____ **1.** A relatively durable change in behavior or knowledge that is due to experience.

_____ **2.** Irrational fears of specific objects or situations.

_____ **3.** The most common name of a type of learning in which a neutral stimulus acquires the ability to evoke a response that was originally evoked by another stimulus.

_____ **4.** Another name for classical conditioning derived from the name of the person who originally discovered the conditioning phenomenon.

_____ **5.** A type of classical conditioning, especially resistant to extinction, in which responses involved are emotion-laden likes and dislike.

_____ **6.** A stimulus that evokes an unconditioned response.

_____ **7.** The response to an unconditioned stimulus.

_____ **8.** A previously neutral stimulus that has acquired the capacity to evoke a conditioned response.

_____ **9.** A learned reaction to a conditioned stimulus that occurs because of previous conditioning.

_____ **10.** To draw out or bring forth, as in classical conditioning.

_____ **11.** Any presentation of a stimulus or pair of stimuli in classical conditioning.

_____ **12.** The formation of a new response tendency.

_____ **13.** Learning without reinforcement that is not apparent from behavior when the learning first occurs.

_____ **14.** The gradual weakening and disappearance of a conditioned response tendency.

_____ **15.** The reappearance of an extinguished response after a period of nonexposure to the conditioned stimulus.

_____ **16.** Occurs when an organism responds to new stimuli that are similar to the stimulus used in conditioning.

_____ **17.** Occurs when an organism learns not to respond to stimuli that are similar to the stimulus used in conditioning.

_____ **18.** Occurs when a conditioned stimulus functions as if it were an unconditioned stimulus.

_____ **19.** This term, introduced by Skinner, refers to learning in which voluntary responses come to be controlled by their consequences.

_____ **20.** Another name for operant conditioning, this term was introduced earlier by Edward L. Thorndike.

21. Law stating that if a response in the presence of a stimulus leads to satisfying effects, the association between the stimulus and the response is strengthened.

22. Occurs when an event following a response strengthens the tendency to make that response.

23. A standard operant chamber in which an animal's responses are controlled and recorded.

24. Production of voluntary responses in responding in operant conditioning.

25. The circumstances or rules that determine whether responses lead to presentation of reinforcers; or, the relationship between a response and positive consequences.

26. Device that creates a graphic record of operant responding as a function of time.

27. The reinforcement of closer and closer approximations of the desired response.

28. A small enclosure in which an animal's responses are recorded and followed by specified consequences; a Skinner box.

29. Occurs when an organism continues to make a response after delivery of the reinforcer for it has been terminated.

30. Cues that influence operant behavior by indicating the probable consequences (reinforcement or nonreinforcement) of a response.

31. Stimulus events that are inherently reinforcing because they satisfy biological needs.

32. Stimulus events that acquire reinforcing qualities by being associated with primary reinforcers.

33. A specific pattern of presentation of reinforcers over time.

34. Occurs when every instance of a designated response is reinforced.

35. The name for all schedules of reinforcement in which a designated response is reinforced only some of the time.

36. The schedule in which the reinforcer is given after a fixed number of nonreinforced responses.

37. The schedule in which the reinforcer is given after a variable number of nonreinforced responses.

38. The schedule in which the reinforcer is given for the first response that occurs after a fixed time interval has elapsed.

39. The schedule in which the reinforcer is given for the first response that occurs after a variable time interval has elapsed.

40. Occurs when a response is strengthened because it is followed by the arrival of a rewarding (presumably pleasant) stimulus.

41. Occurs when a response is strengthened because it is followed by the removal of an aversive (unpleasant) stimulus.

42. Occurs when an organism engages in a response that brings aversive stimulation to an end.

43. Occurs when an organism engages in a response that prevents aversive stimulation from occurring.

44. Occurs when an event that follows a response weakens or suppresses the tendency to make that response.

45. Occurs when an animal's innate response tendencies interfere with conditioning processes.

_____ **46.** Occurs when an organism's responding is influenced by the observation of others, who are called models.

_____ **47.** A systematic approach to changing behavior through the application of the principles of conditioning.

_____ **48.** When a designated response is reinforced only some of the time; another name for intermittent reinforcement.

_____ **49.** Another name for secondary reinforcers.

_____ **50.** A written agreement outlining a promise to adhere to the contingencies of a behavior-modification program.

Answers: 1. learning **2.** phobias **3.** classical conditioning **4.** Pavlovian conditioning **5.** evaluative conditioning **6.** unconditioned stimulus (UCS) **7.** unconditioned response (UCR) **8.** conditioned stimulus (CS) **9.** conditioned response (CR) **10.** elicit **11.** trial **12.** acquisition **13.** latent learning **14.** extinction **15.** spontaneous recovery **16.** stimulus generalization **17.** stimulus discrimination **18.** higher-order conditioning **19.** operant conditioning **20.** instrumental learning **21.** law of effect **22.** reinforcement **23.** Skinner box **24.** emit **25.** reinforcement contingencies **26.** cumulative recorder **27.** shaping **28.** operant chamber **29.** resistance to extinction **30.** discriminative stimuli **31.** primary reinforcers **32.** secondary reinforcers **33.** schedule of reinforcement **34.** continuous reinforcement **35.** intermittent reinforcement **36.** Fixed-ratio (FR) schedule **37.** variable-ratio (VR) schedule **38.** Fixed-interval (FI) schedule **39.** variable-interval (VI) schedule **40.** positive reinforcement **41.** negative reinforcement **42.** escape learning **43.** avoidance learning **44.** punishment **45.** instinctive drift **46.** observational learning **47.** behavior modification **48.** partial reinforcement **49.** conditioned reinforcers **50.** behavioral contract.

Review of Key People

Albert Bandura
John Garcia
Ivan Pavlov
Robert Rescorla
Martin Seligman
B. F. Skinner
E. L. Thorndike
John B. Watson

_____ **1.** The first to describe the process of classical conditioning.

_____ **2.** Founded behaviorism; examined the generalization of conditioned fear in a boy known as "Little Albert."

_____ **3.** Developed a principle known as the law of effect; coined the term *instrumental learning*.

_____ **4.** Elaborated the learning process known as operant conditioning; investigated schedules of reinforcement; developed programmed learning.

_____ **5.** Asserted that environmental stimuli serve as signals and that some stimuli in classical conditioning are better signals than others.

_____ **6.** Described and extensively investigated the process of observational learning.

_____ **7.** Discovered that taste aversion was conditioned only through taste and nausea pairings and not through other stimulus pairings, such as taste and shock.

_____ **8.** Proposed the theory of preparedness, the notion that there are species-specific predispositions to condition to certain stimuli and not to others.

Answers: 1. Pavlov **2.** Watson **3.** Thorndike **4.** Skinner **5.** Rescorla **6.** Bandura **7.** Garcia **8.** Seligman.

Self-Quiz

1. In Pavlov's original demonstration of classical conditioning, salivation to the bell was the:
   a. conditioned stimulus
   b. conditioned response
   c. unconditioned stimulus
   d. unconditioned response

2. Sally developed a fear of balconies after almost falling from a balcony on a couple of occasions. What was the conditioned response?
   a. the balcony
   b. fear of the balcony
   c. almost falling
   d. fear resulting from almost falling

3. When the UCS is removed and the CS is presented alone for a period of time, what will occur?
   a. classical conditioning
   b. generalization
   c. acquisition
   d. extinction

4. Sally developed a fear of balconies from almost falling. Although she has had no dangerous experiences on bridges, cliffs, and the view from tall buildings, she now fears these stimuli as well. Which of the following is likely to have produced a fear of these other stimuli?
   a. instinctive drift
   b. spontaneous recovery
   c. generalization
   d. discrimination

5. A researcher reinforces closer and closer approximations to a target behavior. What is the name of the procedure she is using?
   a. shaping
   b. classical conditioning
   c. discrimination training
   d. extinction

6. John says, "Please pass the salt." Ralph passes the salt. "Thank you," says John. John's request precedes a behavior (salt passing) that is reinforced ("Thank you"). Thus, the request "Please pass the salt" is a _____ for passing the salt.
   a. discriminative stimulus
   b. response
   c. positive reinforcer
   d. conditioned stimulus (CS)

7. A rat is reinforced for the first lever-pressing response that occurs, *on the average*, after 60 seconds. Which schedule is the rat on?
   a. FR
   b. VR
   c. FI
   d. VI

8. When the rat presses a lever, the mild electric shock on the cage floor is turned off. What procedure is being used?
   a. punishment
   b. escape
   c. discrimination training
   d. avoidance

9. A cue light comes on in the dog's shuttle box. It jumps the hurdle to the other side. What procedure is being used?
   a. punishment
   b. escape
   c. discrimination training
   d. avoidance

10. In a signal relations study, CS-UCS trials are alternated with presentation of the UCS alone. What will occur?
   a. stronger conditioning than would have occurred without the UCS alone trials
   b. weaker conditioning than would have occurred without the UCS alone trials
   c. latent learning
   d. extinction

11. The contingencies are as follows: if the response occurs, a stimulus is *presented*; if the response does not occur, the stimulus is not presented. Under this procedure the strength of the response *decreases*. What procedure is being used?
   a. positive reinforcement
   b. negative reinforcement
   c. punishment
   d. avoidance training

12. In terms of the traditional view of conditioning, research on conditioned taste aversion was surprising because
   a. there was a very long delay between CS and UCS
   b. the dislike of a particular taste was operantly conditioned
   c. conditioning occurred to all stimuli present when the food was consumed
   d. the sense of taste seems to be relatively weak

13. Animal trainers (the Brelands) trained pigs to put coins in a piggy bank for a food reward. The animals learned the response but, instead of depositing the coins immediately in the bank, the pigs began to toss them in the air, drop them, push them on the ground, and so on. What had occurred that interfered with conditioning?
   a. conditioned taste aversion
   b. blocking
   c. instinctive drift
   d. S & L scandal

14. Which of the following produces strong resistance to extinction?
   a. a continuous reinforcement schedule
   b. an intermittent reinforcement schedule
   c. optimal foraging behavior
   d. discrimination and differentiation

15. Earlier learning viewpoints considered classical and operant conditioning to be automatic processes involving only environmental events that did not depend at all on biological or cognitive factors. Research on which of the following concepts cast doubt on this point of view?
   a. latent learning, signal relations, and instinctive drift
   b. extinction, discrimination, and generalization
   c. CRF, ratio, and interval schedules
   d. escape, avoidance, and spontaneous recovery

Answers: **1.** b **2.** b **3.** d **4.** c **5.** a **6.** a **7.** d **8.** b **9.** d **10.** b **11.** c **12.** a **13.** c **14.** b **15.** d.

InfoTrac Keywords

Behavior Modification
Classical Conditioning
Intermittent Reinforcement
Operant Conditioning