

# Learning

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## RESOURCES

### Introducing Learning

#### *Classroom Exercise: Defining Learning*

Thomas Rocklin has developed a useful classroom exercise to introduce and define learning. On the day you begin your discussion of learning, distribute a copy of Handout 1 to each student. Ask the students to decide as a class which events are examples of learning and which are not. The specific events are likely to elicit varying degrees of disagreement. Ask students to defend their position by proposing their own definition of learning. Finally, present Hilgard and Bower's definition of learning, which expands that presented in the text: Learning refers to the relatively permanent change in a person's behavior to a given situation brought about by his (or her) repeated experiences in that situation, provided that the behavior change cannot be explained on the basis of native response tendencies, maturation, or temporary states of the person or other animal (e.g., fatigue, drugs, etc.).

Rocklin reports that applying the definition yields fairly clear-cut answers for the 10 events except for item (8), the computer program. Students generally contend that a computer cannot "learn" because it "does only what it is programmed to do." If time allows and you have computers readily available, you may want to address the question of computer learning with another exercise suggested by Thomas Rocklin. See his article for additional information.

Rocklin, T. (1987). Defining learning: Two classroom activities. *Teaching of Psychology, 14*, 228–229.

#### *Classroom Exercise/Critical Thinking Break: Identifying Conditioned Behaviors*

This exercise, used just prior to covering classical and operant conditioning in class, will help students establish a framework for understanding the concept of associative learning in humans. Or use it after covering these topics as an assessment of whether students understand the important principles behind these processes. Distribute Handout 2, then have students work on the questions individually or in small groups in

class, or you can assign them as homework. The more examples students have to generate on their own, the more time this activity will take. You can save some time by providing your own examples to the class. The questions, with possible answers, are repeated here for your convenience.

1. Reflexive, Automatic Behaviors:
  - a. *Name a behavior that is automatically produced as a response to a stimulus or set of stimuli in your environment (e.g., a sight, a sound, or some other occurrence).*  
Any conditioned response is a good answer here. Just be sure you or the students have selected a behavior that is automatically elicited by a stimulus. Consider these examples: "jumping" response when something startles you; a grimace of disgust when you smell something stinky; a feeling of anxiety when your professor asks you to "clear your desks and take out a pen." (If you are using this activity as an assessment tool after covering the chapter content, ask students to identify whether the reflex they've described is conditioned (learning needed to establish the reflex) or unconditioned ("naturally" occurs without prior associative learning).)
  - b. *What stimulus or set of stimuli automatically causes you to produce this behavior?*  
Students should identify the stimuli that elicit the behaviors named in 1a. As an assessment measure, ask students to identify whether the stimuli are conditioned or unconditioned.
  - c. *Give an example of conditions that strengthen this reflexive behavior or cause it to occur more often.*

In classical conditioning, associations are acquired when neutral stimuli are paired with unconditioned stimuli. So, it would be appropriate for students to discuss here any contexts or situations that would cause stimuli to be paired together, to occur together more frequently, or to occur closer in time to each other. It is also appropriate to discuss biological relevance of stimuli to each other or to the response, or cognitive factors that might affect the associations

that learners establish between stimuli. It would be appropriate for students to describe spontaneous recovery here, too.

- d. *Give an example of conditions that weaken this reflexive behavior or cause it to occur less often.*

This question is designed to get students to think about extinction. Conditions or variables that prevent the pairing of stimuli, extend the time between pairings, or eliminate the occurrence of the unconditioned stimulus will effectively lead to extinction.

2. Voluntary Behaviors:

- a. *Name a specific behavior that you produce to gain something (that you like) as an outcome of that behavior.*

This item is about the positive reinforcement of a behavior due to receipt of a positive reinforcer. Simple examples would be continuing in a task or trying to do well because of attention or praise received afterward, pursuing good grades because of a monetary reward, and children being potty trained because they earn stickers or other incentives for “going” on the toilet.

- b. *Give an example of conditions that strengthen this voluntary behavior or cause it to occur more often.*

Students should describe positive reinforcers and/or their primary or secondary “value” to the learner. Also, students could describe variables related to schedules of reinforcement, the timing of reinforcers in relation to behavior, and so on.

- c. *Name a specific behavior that you produce to avoid something (that you don’t like) as an outcome of that behavior.*

Students should describe negative reinforcement due to removal of an aversive stimulus (e.g., doing chores to make nagging stop, studying for future exams because of a poor outcome on a previous exam for which one did not study, and hitting the “snooze bar” on an alarm clock to turn off its buzzing (and to get more sleep).

- d. *Give an example of conditions that strengthen this voluntary behavior or cause it to occur more often.*

The appropriate response should be similar to 1b above, except the key is to describe negative reinforcers (the aversive things that are removed).

- e. *Name a specific behavior that earns you something that you do not like as an outcome of that behavior.*

Students should describe an example of positive punishment. Many students choose examples of corporal punishment (e.g., the cessation of

childhood misbehaviors because of spankings or swattings), but other examples might include behaviors that incur ridicule or shame from other people, behaviors that cause the destruction or ruining of toys or personal belongings, etc.

- f. *Give an example of conditions that weaken this voluntary behavior or cause it to occur less often.*

The students should focus on the aversive results that are gained from the behavior produced in the example, as well as the timing, frequency, or inherent/acquired value of those “results” for the individual. The “weakening” is the successful outcome of the punishment.

- g. *Name a specific behavior that you produce to avoid losing something that you do like as an outcome of that behavior.*

In this case, students should describe behaviors that cause them to lose things that they value (e.g., having the car keys taken away when they come home after curfew, loss of privileges after misbehavior, losing rank or status in an organization after enacting a poor decision). Avoidance of these behaviors in the future is developed after experiencing the loss after the initial behavior is produced and punished.

- h. *Give an example of conditions that weaken this voluntary behavior or cause it to occur less often.*

Again, the correct answer here is one that focuses on the things that are “lost” or taken away from the actor when a behavior is produced, and the variables related to the how/when of their removal.

*Lecture/Discussion Topic: Cultural Beliefs About Learning: Mind or Virtue?*

Ask your students, “What words come to mind when you think of the process of learning?” Answers are likely to reflect their underlying assumptions about what we learn as well as how we learn. Jin Li argues that traditional research on human learning has neglected people’s beliefs about learning and especially the role of culture in shaping those beliefs.

Li notes that when Socrates tutored the slave boy Meno about the Pythagorean theorem, he led the pupil to believe that he possessed a mind capable of discovering knowledge. Western cultural beliefs about learning still emphasize the Socratic ideal that the best learners are those who use their minds to inquire into the world.

In contrast, Eastern cultures’ understanding of learning is exemplified by the great tutor Mencius for whom learning was a matter of perfecting himself morally. For Chinese culture, the essential quality for any learner is to strive to become a more virtuous person.

Li reports that research into terms that refer to learning reflect this important cultural difference. Western students tend to see learning as a matter of understanding the essentials of a given topic or developing expertise in a field. When learners succeed, they feel proud of themselves; when they fail, they feel disappointment and suffer low self-esteem. Eastern students learn mainly to perfect themselves morally and socially and to contribute to society. Learners need to develop the virtues of diligence, perseverance, and concentration. Moreover, they must be respectful of teaching authorities and they must demonstrate humility.

From a Western perspective, a good teacher is one who arouses students' interest, explains clearly, uses effective instructions, and organizes activities well. From a Chinese perspective, a good teacher is one who has deep knowledge, can readily answer questions, and is a good moral model.

Li reports that these cultural differences about learning are evident at a very early age. American and Chinese children responded to questions about a high achiever in a fictional story. Americans emphasized the achiever's intellectual growth, his feelings of happiness and pride, and his concern that peers might have negative feelings (envy?) toward him. Chinese children more frequently mentioned the higher status of the achiever, his humility and ability to help others, and his belief that peers likely wanted to emulate him.

Li, J. (2005). Mind or virtue: Western and Chinese beliefs about learning. *Current Directions in Psychological Science, 14*, 190–194.

## Classical Conditioning

*Lecture/Discussion Topic: Watson's Colorful History*

In *The Story of Psychology*, Morton Hunt relates John B. Watson's colorful life history. "No one did more to sell behaviorism to American psychologists," writes Hunt, "than Professor John B. Watson of Johns Hopkins University." As a gifted huckster who sold himself and his ideas to the discipline, he rose quickly to the top of his profession. Following a sexual scandal, he left psychology to pursue a lucrative career as a consultant to a major advertising firm.

Born near Greenville, South Carolina, Watson was the son of a farmer who, because of his violence, developed an unsavory reputation. When his father abandoned the family, Watson's mother, an upright, devout Baptist, sold the farm and moved to Greenville. Here Watson performed poorly in school. "I was lazy," he later wrote, "somewhat subordinate, and, so far as I know, never made a passing grade." Even worse, he was arrested twice for brawling and for firing a gun within city limits.

Nonetheless, Watson convinced the president of Furman College to admit him. Although initially fol-

lowing his mother's wish that he study for the Baptist ministry, Watson later turned against religion. He preferred philosophy courses, especially those that included psychological studies. After graduation, he taught in a one-room school for one year before attending the University of Chicago to pursue advanced study in philosophy. Switching to psychology, he did excellent work and, after graduating, was offered an assistantship in experimental psychology at Chicago. He was repeatedly promoted and, at only 30 years of age, was offered the chair of psychology at Johns Hopkins University. His annual salary was \$3500.

Watson's quick rise through the ranks was due largely to his successful experimental work in animal learning. He taught rats to run through his miniature replica of the maze at Hampton Court, Henry VIII's royal retreat outside London. Carefully depriving rats of visual, auditory, and olfactory cues, he found that they still learned the maze. He concluded that kinesthetic cues were the key to the rat's learning.

Beginning in 1908, he began advocating a new psychology based entirely on observable behavior. In 1913, he wrote an article in the *Psychological Review*, often referred to as "the behaviorist manifesto." It formally inaugurated the era of behaviorism. In only three sentences he declared three revolutionary principles: first, psychology's content should be behavior; second, its method should be objective rather than introspective; third, its goal should be the "prediction and control of behavior" rather than the fundamental understanding of mental events. In 1915, Watson was elected president of the American Psychological Association.

In his APA presidential address, he suggested the conditioned reflex method for studying behavior. Although he was barely familiar with Pavlov's work, he offered it as the strategy for doing research with animals and humans. He himself began to study conditioned reflexes in infants. His famous work with Rosalie Rayner involved classically conditioning an 11-month-old infant.

An affair with Rayner led to his dismissal from Johns Hopkins. Turning to advertising, he conceived some of J. Walter Thompson's most successful campaigns. These included one for Pond's Cold and Vanishing Creams using testimonials from the queens of Spain and Romania, another for Johnson & Johnson convincing mothers to use baby powder after every diaper change, and one for Maxwell House that helped make the "coffee break" an American custom.

From 1930 on, Watson had nothing to do with psychological theory or research. Decades later, when he was nearly 80, the APA awarded him its gold medal for his contributions to psychology. Both surprised and pleased, he went to New York to receive the medal. However, at the last minute, fearing that he would burst into tears, he sent one of his sons to stand in for him.



Watson died in 1958, just a year after receiving the award. He remained firmly convinced that the revolution he started would be the psychology of the future.

Hunt, M. (2007). *The story of psychology*. (Updated and revised ed.). New York: Doubleday.

### Basic Principles and Processes of Classical Conditioning

#### *Classroom Exercise: Ringing the Bell*

A very simple interactive tutorial is provided at the website for Simply Psychology ([www.simplypsychology.org/classical%20conditioning.swf](http://www.simplypsychology.org/classical%20conditioning.swf)) in which students can reenact the basic idea behind Pavlov's original experiments in which he presented dogs with meat and conditioned them to salivate to the sound of a bell. The tutorial guides students through the process of introducing a neutral stimulus and then pairing it with an unconditioned stimulus over several trials. The tutorial requires students to watch for and report when they first detect signs of development of a conditioned response. The experience closes with a quiz with feedback to help students determine whether they have mastered the concepts of classical conditioning.

You can play this tutorial for your class and walk them through it in "real time," or you can assign individuals and/or small groups to work on it before or after the class in which you discuss classical conditioning.

#### *PsychSim 5: Classical Conditioning*

This computer program clearly explains and illustrates the basic elements of classical conditioning: US, UR, CS, CR. It then defines generalization and discrimination and gives students relevant examples. The last module of the program has the student perform the eye-blink conditioning experiment.

### Examples and Demonstrations of Classical Conditioning

#### *Feature Film: Jaws*

As a quick yet effective introduction to the association principle and classical conditioning, play John Williams' powerful theme song to the movie *Jaws*. Without telling your students what song you are playing, ask them to write down what they are feeling. Loreen Huffman noted that half her class reported fear. Several students may recognize the music. For those who have never seen the film, you might show the opening (with the theme). The first shark attack comes at about 3:20 minutes (with the theme); a second, even more gruesome attack (once again with the theme) comes at 16:20 minutes. After presenting the key classical conditioning terms, you might once again play just the music and have students identify the US, UR, CS, and CR.

Huffman, L. (2005, February 8). Re: Emotion. Message posted to PSYCHTEACHER@list.kennesaw.edu.

#### *Classroom Exercise: Classical Conditioning Using Potato Chips and Lemonade Powder*

Classical conditioning is readily demonstrated in the classroom. Lynn Sprott provides a simple yet memorable exercise that provides a snack for everyone. Bring enough bags of potato chips and napkins to class for all your students to enjoy a decent portion. Include at least one bag of salt and vinegar chips.

First, introduce the process of learning, noting that it sometimes occurs automatically. Then, display the full bag(s) of salt and vinegar chips. You will immediately hear some "yums" and some "yucks" echo through the room. Ask your students to describe their reaction to the sight of the salt and vinegar chips. Some will make a face, others will report a flow of saliva or their tongue puckering. Point out that this reaction shows they have learned and, more specifically, have been classically conditioned. Ask if anyone has never eaten salt and vinegar chips. Did they experience any particular reaction? Finally, pass the bags of chips and napkins around the room, asking each student to shake several onto a napkin to eat. Then review the classical conditioning process using the chips as the example. Eating something salty/vinegary = US, salivating/puckering = UR, sight of chip bag, smell of chips, thinking about chips = CS, salivating/puckering = CR. Note that the CR is similar to the UR, only the former is less intense.

Dennis and Rosemary Cogan suggest another simple demonstration of classical conditioning that can be used in virtually any size class. The authors perform the demonstration after classical conditioning principles have been discussed, but it works just as well as an introduction to Pavlov's work. The only materials needed are a can of sweetened lemonade powder and enough small cups so that each student can have one. (To enhance the fun and effectiveness of this exercise, Erik Nilsen suggests using Fun Dip (originally called Lik-m-Aid), the sour candy powder from students' childhood. It comes in three packs of powder with dipping sticks and is available at most grocery stores for less than a dollar.) Give each student a cup of powder, then choose some neutral stimulus to serve as a conditioned stimulus. Although many other neutral stimuli (NS) could be used, the Cogans use the word *Pavlov* as the NS to become the conditioned stimulus. Instruct your students to moisten the tip of their index finger and to watch for your signal (for example, you will raise your arm) to dip their finger into the powder and then put it into their mouth. Also inform them that from time to time you will say the words "test trial" instead of giving the signal; when they hear those words, they

should not dip into the powder but close their eyes and concentrate on their experience.

Present the CS and, after a small delay (0.5 to 1.5 seconds), give the signal for your students to dip into the lemonade powder. Repeat trials at 10- to 15-second intervals, with a test trial after every 10 conditioning trials. After each test trial, ask for a show of hands of those who salivated. When all or most of the students have demonstrated conditioning, begin extinction using the same test-trial procedure (in which you state on successive trials, “Pavlov . . . test trial”). Extinction should be completed during the same class period.

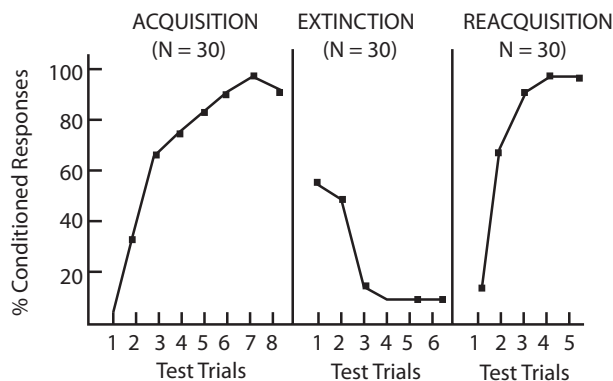
During the next class session, you can demonstrate spontaneous recovery, reacquisition, and even stimulus generalization. At each stage of the demonstration, plot the percentage of CRs as a function of test trials (see the graph below from the Cogans’ classes). Virtually all students will eventually report either a strong or moderate salivary response on the test trial. Many will also report a “puckering” feeling or the taste of lemon-flavored crystals. The graphs below show typical class results of the conditioning demonstration.

Robert Flint suggests a simple variation on this exercise as an out-of-class project that your students can conduct with their friends. They might use crushed Smarties (sweet-and-sour candies) as the US, salivation to the Smarties as the UR, a spoon hitting a glass as the CS, and salivation to the sound of the spoon as the CR. Have students collect data and report back to class.

Borkowski, M. (2003, October 17). Learning activities summary. Message posted to PSYCHTEACHER @list.kennesaw.edu.

Cogan, D., & Cogan, R. (1984). Classical salivary conditioning: An easy demonstration. *Teaching of Psychology*, 11(3), 170–171.

Sprott, L. (2008, October 6). Re: Classical conditioning demo. Message posted to PSYCHTEACHER@list.kennesaw.edu.



Source: Reprinted by permission of Lawrence Erlbaum Associates, Inc., and the authors from Cogan, D., & Cogan, R. (1984). Classical salivary conditioning: An easy demonstration. *Teaching of Psychology*, 11(3), 170–171.

### Classroom Exercise: Classical Conditioning: Preparing for an Important Event

Art Kohn and James Kalat suggest a simple classroom demonstration that shows how classical conditioning helps prepare an organism for an important upcoming event and thus be better able to cope with it. The exercise also demonstrates how the form of the conditioned response can differ significantly from that of the unconditioned response.

Before class begins, fully inflate six to eight balloons and tape them to the classroom chalkboard or wall. When students have arrived, explain to them that you are going to demonstrate classical conditioning, and that throughout the brief exercise, they should carefully monitor their responses. Take a long needle, and after clearly displaying it to the class, loudly count “One, two, three,” and then quickly pierce a balloon. After a few seconds, repeat the process with a second balloon, and then again with at least two more. (Vary the time a bit between poppings to avoid the possible confound of temporal conditioning.) Students are likely to flinch less with each trial. With the fifth or sixth balloon, say “One, two, three,” aim at the balloon but miss it. Students are likely to sit unmoved, even expressionless. Wait a few seconds, perhaps passing the time by pretending confusion over their lack of response, then without warning pop a balloon. Students are likely to jump more than they have to any of the previous piercings.

Kohn and Kalat suggest plotting a curve on the chalkboard, labeling the horizontal axis *Trial Numbers* and the vertical axis *Mean Size Startle Reaction*. Asking your class to recall the strength of their startle reaction for each trial will clearly indicate a steady decline, except for the last trial when an unwarned burst elicited the strongest response of all. Finally, ask students to identify the CS, US, CR, and UR in the demonstration. Although the balloon pop will be quickly identified as the US, flinching as the UR, and some combination of your counting and hand movement as the CS, students are likely to have more difficulty identifying the CR. When some identify flinching as the CR, indicate that this cannot be the case since few if any students flinched when the CS was presented alone (i.e., when you missed on the fifth trial). Remind students that the CR is the response elicited by the CS. Ask, “How did you respond when you heard me counting?” Most will now recognize that the CR consisted of a tightening of their muscles to avoid flinching. To reinforce this interpretation, point to the curve on the chalkboard, noting that flinching decreased across trials as students were better able to respond with a preparatory muscle-clenching, that they did not jump at all to the counting alone on the fifth trial, and that they jumped the highest when they had no chance to emit the preparatory

CR. Conclude by reviewing that classical conditioning involves the acquisition of *expectancies* that help organisms prepare for good or bad events. Thus the function of classical conditioning is not simply to expedite a response so that it occurs before the US begins. Indeed, the US and CS can be quite different responses.

Kohn, A., & Kalat, J. (1992). Preparing for an important event: Demonstrating the modern view of classical conditioning. *Teaching of Psychology, 19*, 100–102.

### *Classroom Exercise: Classical Conditioning With a Watergun*

Joel I. Shenker suggests an exercise that illustrates all of the major classical conditioning phenomena. You will need a large plastic garbage bag, a watergun or spray bottle, and a towel. Bring them to class and ask for a volunteer who does not mind being squirted in the face with water while wearing a large garbage bag.

Cut a hole in the garbage bag so it can be placed over the volunteer's head, then have her (or him) sit in a chair facing the class. Tell the volunteer to keep her eyes closed throughout the demonstration for safety reasons. As you begin, tell your students to watch carefully and to be ready to discuss what they observe.

Read each word in the list below loud enough for everyone to hear. Go through the list at a rate of about 2 seconds per word. Squirt the volunteer in the face only after you have read the uppercase CAN, using a delay of about .5 seconds. Responses to the lowercase "can" test the volunteer's conditioned responses to the target word.

CAN, dish, CAN, bridge, scale, can, fan, board, CAN, cool, three, horn, disk, CAN, can, cast, test, pen, dime, CAN, dish, van, can, card, stand, meat, pad, can, dish, set, can, tree, ice, plum, can, cost, bird, glass, can, light, can, sword, juice, can, dish, rock, smoke, grease, dish, keep, kid, tan, dice, hole, set, dish, eye, friend, wax, bill, bulb, dish, class, mine, mark, work, can, dish, can, bus, dish, phone, can, smart, first, can, crack, feet, can, tub, bowl, can, van, day, can, rake, dish, CAN, bluff, risk, CAN, salt, dish, CAN, ball, stack, CAN, rain, hat, food, can, van, disk, tree, can, cup, can, lime, CAN, dish, girl, chalk, can, dish, CAN, key, screen, ran, CAN, disk, CAN, knob, bag, tape, CAN, dish, clip, CAN, air, ban, cheese, CAN, door, can, box, dish, hair, CAN, ring, nail, CAN, boat, cap, dish, CAN, crane, wheel, fire, CAN, dish, king, cape, apple, CAN, dog, blue, can, dish, CAN, take, call, brick, pair, CAN, spin, chair, CAN, camp

Give the volunteer a towel and a generous thanks. Begin by simply asking your students to describe and discuss what they observed.

1. The US is the water squirted in the volunteer's face, the UR is usually a flinch or squint. The CS is the sound of the word "can" and the CR is the flinch or squint when a word is read without an

accompanying squirt. Acquisition is demonstrated as "can" by itself gradually comes to elicit a CR.

2. Stimulus generalization is evident as words that sound like can (ban, ran, cap, cast) come to produce a CR.
3. Stimulus discrimination is evident when different stimulus words elicit differences in the CRs. They are weakest and least likely to occur after stimulus words that do not sound like "can."
4. Extinction is evident when the CRs disappear after the word "can" is spoken several times without a squirt.
5. Spontaneous recovery occurs if the word "can" again produces a CR after extinction and after a long string of words that does not include the word "can." (This occurs near the end of the exercise.)
6. Reconditioning savings is demonstrated when the word "can" and a squirt are again associated. Fewer conditioning trials are needed to elicit a reliable CR.

Shenker suggests that you may want to have students write down their observations before you begin a class discussion. Simply ask them to write down the US, UR, CS, and CR and to describe the phenomena associated with the learning they observed. In this way, students are required to do their own thinking and can refer to their written notes when you begin the full class discussion.

Shenker, J. I. (1999). Classical conditioning: An all-purpose demonstration using a toy watergun. In L. T. Benjamin et al. (Eds.), *Activities handbook for the teaching of psychology, Volume 4*. Washington, DC: American Psychological Association.

### *Student Project: Conditioning the Eyeblink*

While the exercise in Handout 3 can be done in class, it is probably best if pairs of students collect data on their own. Particularly in larger classes, students will have difficulty seeing other students' responses. Distribute the handout after students are familiar with the basic terminology (US, UR, CS, CR) and the phenomena (acquisition, extinction, spontaneous recovery, generalization, discrimination) of classical conditioning. You might request a written report of their findings. Discuss in class the terminology and phenomena of classical conditioning as it applies to this exercise.

In class, you might note that Joseph E. Steinmetz and his colleagues at Indiana University have found that under certain conditions, people with obsessive-compulsive disorder (OCD) condition three times faster than people without OCD. "Normally, people show consistent conditioned responses after 10 to 15 trials," reports Steinmetz. "Our OCD subjects showed consistent conditioned responses after as few as three to five trials." He notes that the finding is consistent with



theories stating that victims of anxiety disorders suffer a general susceptibility to aversive conditioning.

Several years ago, Steinmetz reported that people with autism also condition much faster than those without autism. Those with autism seemed to overattend to neutral stimuli, which facilitated the conditioning process and caused mistimed learned responses. Together, these findings demonstrate how research on the very basic mechanisms of learning can lead to practical information about the human condition.

Azar, B. (1999, March). Classical conditioning could link disorders and brain dysfunction, researchers suggest. *APA Monitor*, 17.

### Applications of Classical Conditioning

*Lecture/Discussion Topic: Classical Conditioning, Implicit Self-Esteem, and Automatic Racial Prejudice*

Associations, even those not consciously noticed, can give rise to attitudes. Jodene R. Baccus and colleagues have demonstrated how classical conditioning can even increase the automatic, nonconscious aspect of self-esteem.

Implicit self-esteem is conceptualized as a self-evaluation that occurs unintentionally and outside of awareness. Researchers have developed means of assessing implicit self-esteem by examining automatic associations between “self” and “good.” For example, the Implicit Association Test (IAT) requires participants to sort words into categories. In one set of trials, the correct response for self-related words (e.g., *me*) and the correct response for pleasant words (e.g., *rainbow*) require pressing the same key. In other trials, self-related words are assigned the same key as unpleasant words (e.g., *vomit*). Faster reaction times are theorized to reflect stronger associations. Thus, the amount of implicit self-esteem is determined by comparing the amount of time it takes participants to respond to target words when self-related and positive words share the same key with the amount of time it takes to respond when self-related and negative words share the same key. The Name Letter measure provides a second assessment of implicit self-esteem. It simply indexes the extent to which participants prefer the initials of their name to other letters of the alphabet.

In Baccus’ experiment, the participants enter into a computer the answers to six questions about themselves (e.g., first name, date of birth). They are then instructed that a word will appear randomly in one of the quadrants on the screen. Their task is to click on the word as quickly as possible. They are also told that doing so will cause an image to be displayed briefly in that quadrant. The procedure is repeated for 240 trials. The words appearing on the screen are chosen from the participant’s answers to the first six questions (self-relevant words), as well as from a preprogrammed list

of words that are similar types of words but not relevant to the participant. In the crucial experimental condition, self-relevant words are always paired with an image of a smiling face; while in the control condition, a random selection of smiling, frowning, and neutral faces follows the self-relevant words. As predicted, participants completing the experimental version of the conditioning task exhibited significantly higher implicit self-esteem (as measured by the IAT and the Name Letter measure) than those who completed the control version of the conditioning task.

The authors conclude that a simple conditioning paradigm, originally developed by learning theorists to study animal responses to expectations of food or shock, was effective in modifying people’s unconscious responses to themselves. The finding also fits well, observe the authors, with theories that find the roots of self-acceptance in positive, warm feedback from other people.

More recently, a similar conditioning technique successfully reduced automatic racial prejudice. Michael Olson and Russell Fazio paired photos of Black persons with positive words and images and White persons with negative words and images. Although the White research participants were unaware of the repeated pairings, the procedure was found to be effective in reducing subtle racial prejudice.

Baccus, J. R., Baldwin, M. W., & Packer, D. J. (2004). Increasing implicit self-esteem through classical conditioning. *Psychological Science*, 15, 498–502.

Olson, M. A., & Fazio, R. H. (2006). Reducing automatically activated racial prejudice through implicit evaluative conditioning. *Personality and Social Psychology Bulletin*, 32, 421–433.

*Classroom Exercise/Critical Thinking Break: “Unpacking” Examples of Extinction and Spontaneous Recovery*

To enhance student understanding of extinction and spontaneous recovery, have them consider their physical and emotional reactions to everyday events. You can use the two examples here, or you can make up your own. You can ask students to complete this task alone or in small groups. It should take students about 10–15 minutes to respond to each of the following situations.

“I’m Never Eating THAT Again!”

Taste aversion, in which the consumption of a food or drink is associated with the experience of nausea or other symptoms of illness can be used here to illustrate extinction and spontaneous recovery. Ask students, Have you ever experienced taste aversion yourself? If so, describe the situation.

- Explain what was consumed or tasted and the context in which it was eaten or tasted.
- Then, explain the aversive experience that followed the eating/tasting.
- How did you know you had developed taste aversion?
- Did you experience extinction and/or spontaneous recovery of this conditioned response? If so, explain how/when these happened. If you did not, explain how you know the response was not extinguished or spontaneously recovered.

“Time Heals All Wounds.”

Grief is a highly individual response to loss. Everyone grieves differently, but one common aspect to all grief reactions is that it takes some time for the sadness and feelings of loss to subside. Ask students to consider what happens after the loss of a loved one or a dear friend/companion (human or animal).

- Immediately after the loss, people report great difficulty being around the “things” associated with the loved one (personal effects, photos, favorite songs, favorite places). Explain why this would occur, using the vocabulary of classical conditioning.
- After a while, the grieving person finds it easier to tolerate being in the presence of items associated with the lost loved one. Explain why this would occur, again using the vocabulary of classical conditioning.
- Some time in the future a person will “get over the grief” to the extent that he or she no longer experiences the great sadness and pain of having lost the loved one (a sense of “missing” the person does still remain). Why would this be considered an “extinction” of the grief as a response?
- Describe a situation in which “spontaneous recovery” of the grief might occur. What might provoke it? How might a therapist help the grieving person again extinguish the response using principles of extinction?

*Classroom Exercise/Critical Thinking Break: Little Albert’s Legacy*

Many students express shock and empathy for what Little Albert must have experienced at the hands of Watson and Rayner in their efforts to condition him to fear white rats. You will recall that their work caused a generalization of the fear response to other fuzzy white objects. Clearly, such experiments would never be approved by Institutional Review Boards at institutions today. Encourage students to consider the current climate for psychological science and the ethical guidelines for psychological research in the context of what they are learning about Little Albert. Ask them to

complete the following:

- Name three principles of the ethical guidelines that guide psychological research that Watson and Rayner violated in their experiments with Little Albert (see the Introduction).
- Come up with two specific recommendations for how Watson and Rayner could have investigated the same principles, but using today’s standards and ethical guidelines. Be sure to explain how these recommendations would improve the ethical nature of their experiments.

You can have students work on this in class or as a homework assignment, individually or in small groups.

*Lecture/Discussion Topic: The Association Principle at Work*

Robert Cialdini provides many examples of the association principle at work in modern life. Students will find them both amusing and informative. Advertisers, of course, apply the principle regularly. By associating a physically attractive model with an automobile, for example, they hope we will also see the product as more desirable. Does it work? In one study, men who saw a car ad that included a seductive young woman rated the car as faster, better-designed, and more appealing than did men who viewed the same ad without the model. When asked, the men refused to believe the model had anything to do with their judgments.

Associating celebrities with products is another technique used by advertisers. Movie stars and professional athletes are paid to endorse products that may be unrelated to their roles (soft drinks, breakfast cereals, toothpaste). As Cialdini points out, the connection does not have to be logical, just positive.

Politicians also attempt to link themselves with positive values, including motherhood and apple pie. For example, the president traditionally tries to sway reluctant legislators over a meal. Similarly, political fund raisers are regularly held as luncheons or dinners (or as coffee hours in the White House). Research suggests that associating people or things with food may be an effective technique. After political slogans were associated with the eating of food, people became more approving of them. Slogans linked with putrid odors were disliked.

The association principle also explains why radio announcers are instructed to mention the station’s call letters just before a hit song is played and why those playing bingo at a Tupperware party must yell the word “Tupperware” rather than “Bingo” in order to receive their prize. As Cialdini observes, “It may be ‘Tupperware’ for the women, but it’s ‘Bingo’ for the company.”

People’s reactions to TV weather forecasters also illustrate the association principle. Cialdini reports

being visited by a local weather forecaster who complained of receiving hate mail whenever it rained. Weather forecasters throughout the country have been whacked by old ladies with umbrellas, pelted with snowballs and galoshes, threatened with death, and accused of trying to play God. One reports, “I had one guy call and tell me that if it snowed over Christmas, I wouldn’t live to see New Year’s.” Another reports being approached by a farmer in a bar, “You’re the one that sent that tornado and tore my house up. . . . I’m going to take your head off.” Cialdini recalls that the Persian messenger who reported victory received food, drink, and the woman of his choice; when he reported defeats, he was summarily slain.

We all recognize how the principle works. We associate ourselves with good news but not with bad. Students in an experiment were assigned the task of informing a fellow student that he was wanted for an important phone call. Half the time the call presumably brought good news, half the time the news was bad. When the news was good, the reporter was sure to mention it—“You just got a phone call with great news.” If the news was unfavorable—“You just got a phone call. Better see the experimenter for the details.”

Students will readily identify with another of Cialdini’s examples. We associate ourselves with our favorite sports team when they win but not when they lose. When the team wins we report, “We beat them, 17 to 14.” When the team loses, we say, “*They* lost, 24 to 12.” In one study of seven prominent football campuses, researchers counted the number of students wearing school sweatshirts after a Saturday game. The results showed that more school sweatshirts were worn when the football team won than when it lost. In 1980, the fans of the losing New Orleans Saints began wearing paper sacks that concealed their faces, except for the tips of their noses. When it eventually became clear that the Saints were going to win a game, the fans discarded the bags.

Cialdini, R. B. (2009). *Influence: Science and practice* (5th ed.). Needham Heights, MA: Allyn & Bacon.

#### *Lecture/Discussion Topic: Phobias*

If you discuss fear conditioning, you can readily extend your comments to a more general discussion of phobias. The Psychological Disorders unit in these resources contains a fear survey and the accompanying discussion identifies a number of specified fears. In addition to showing how classical conditioning explains the formation of phobias, describe how it is used in treating them. The application of systematic desensitization to the treatment of irrational fear is discussed in the text discussion of therapies.

## Operant Conditioning

### Basic Principles and Processes of Operant Conditioning

#### *Classroom Exercise/Student Project: A Build-It-Yourself Skinner Box*

Commercial Skinner boxes are expensive. Paul Brandon and Kenneth Steele explain how you or your students can build your own, using a Styrofoam picnic chest.

Begin by drilling a hole in one end near the bottom of the chest to insert an eyedropper for delivering reinforcement (for a rat, sweetened water or milk works). Near the eyedropper hole, cut an oblong slot (drilling two or three holes will do it) to insert a wooden dowel that will serve as the response lever. Drill a hole through the middle of the dowel large enough for a nail to fit through as a pivot. Rub the nail across a piece of soap so it slides and pivots more easily. Now insert the nail in the dowel and put the dowel through the oblong slot (nail pivot should be on the outside of the chest). Duct tape the arrangement in place for your response lever. Also duct tape some weights (pennies will do) to the outside end of the dowel so the inside lever stays upright. You may want to pair the presentation of the reinforcer with some sort of clicker. You can shape many responses with this type of arrangement. For example, in addition to bar pressing, the rat can be shaped to hold down the lever for a specified period of time.

Brandon, P. (2001, August 8). Skinner Box. Message posted to PsychTeacher discussion list, archived at <http://list.kennesaw.edu/archives/psychteacher.html>.

Steele, K. M. (2001, August 8). Skinner Box. Message posted to PsychTeacher discussion list, archived at <http://list.kennesaw.edu/archives/psychteacher.html>.

#### *PsychSim 5: Operant Conditioning*

Structured like the program on classical conditioning, this begins by explaining and illustrating the basic elements of operant conditioning. It also points out the differences between classical and operant conditioning. Types of reinforcers are introduced and illustrated. In the concluding module, a rat presses a bar in order to obtain drops of water. The student selects the schedule of reinforcement; the rat’s response rate under each schedule is shown on a comparative graph. This is best used after students understand reinforcement schedules.

#### *Classroom Exercise: Negative Reinforcement Versus Punishment*

Negative reinforcement, which is frequently confused with punishment, may be psychology’s most often misunderstood concept. Robert Tauber provides a

classroom exercise to teach the distinction between negative reinforcement and punishment. Begin by stating that operant conditioning, when properly applied, can effectively modify the behavior of others. However, to apply a “carrot *and* stick” approach successfully, users must understand which consequences are available as carrots to strengthen desired behaviors and as sticks to weaken undesired behaviors.

Next, administer Handout 4, Tauber’s Negative Reinforcement Quiz. After giving students a few min-

utes to respond, ask for their answers. Many, perhaps most, will answer the first question with “punishment” or something similar. They are likely to answer most of the other questions incorrectly as well, concluding that they would *not* use negative reinforcement in the future (question 5).

Introduce the headings of the following Consequence Matrix. (Tauber recommends use of a transparency, but the matrix can also be drawn on the whiteboard.)

Consequence Matrix

Stimulus Type	Supply a Stimulus	Remove a Stimulus
Appetitive Stimulus (Something desired)	Positive Reinforcement	Time-out* or Punishment
Aversive Stimulus (Something not desired)	Punishment	Negative Reinforcement

\*For example, a child misbehaving at a birthday party may be required to sit on a chair in the laundry room for 5 minutes. (The situation from which a person is withdrawn must be enjoyable and reinforcing.)

Lead students through the matrix, beginning with “supply an appetitive stimulus”; fill in each of the boxes as the correct answer is given (in this case, positive reinforcement). By the time you ask, “What is it called when someone removes an aversive stimulus?” most students will answer “negative reinforcement,” although reluctantly. Then ask, “Given that negative reinforcement involves the removal of an aversive stimulus, is it used to strengthen or weaken behavior?” Although there may be some hesitation, most will now recognize that negative reinforcement strengthens desired behaviors.

You may now want to review the quiz. Negative reinforcement is clearly not a synonym for punishment. Point out that the correct answer to the second question is “b” and the correct answer to the third is “yes.” Because both positive and negative reinforcement are used to strengthen behavior, students answering “yes” to the fourth question and “no” to the fifth may want to reconsider their answers.

End the discussion by giving some examples of negative reinforcement and punishment. “If you clean your room, you will no longer have to stay inside” illustrates negative reinforcement. “Because you did not clean your room, you will have to stay inside today” illustrates punishment. The first statement says, “If you do what I want (clean your room), I will remove an aversive stimulus (you no longer have to stay inside).” The second statement says, “Because you did not do what I want (clean your room), I will supply an aversive stimulus (you must stay inside).” Ask your students to volunteer their own examples of contrasting statements.

Summarize: “Negative reinforcement and punish-

ment are used for entirely different purposes. Negative reinforcement strengthens behaviors, whereas punishment weakens behaviors.”

Tauber, R. (1990). Teaching the distinction between negative reinforcement and punishment. In V. P. Makosky et al. (Eds.), *Activities handbook for the teaching of psychology* (Vol. 3, pp. 99–102). Washington, DC: American Psychological Association.

#### *Classroom Exercise/Lecture Break: Distinguishing Among Forms of Reinforcement and Punishment*

Have students generate examples of positive and negative reinforcement and positive and negative punishment using the two-by-two table in Handout 5. You can leave the types of examples completely up to the students, or you can frame this exercise in a specific context. For instance, you might provide the following vignette and instructions:

Pauline is the mother of 2-year-old Elliot. Elliot has developed the habit of slapping adults in the face whenever he is picked up. This developed after Elliot’s grandparents came to visit, and he slapped his grandfather in the face. His grandparents laughed, thinking it was cute. They said, “Oh my, this little boy is going to be a prizefighting champion!” They encouraged Elliot to do this several more times during their visit.

Pauline wants to use principles of operant conditioning to stop Elliot’s face slapping. She wants Elliot to learn to kiss someone on the cheek when he is picked up instead of slapping the adult in the face.

How could she design a program to reinforce the kissing and punish the slapping, using both positive and



negative procedures (for each process)? Use the table in Handout 5 in generating four strategies she could use to achieve her goal.

*Lecture/Discussion Topic: Skinner's Last Days*

B. F. Skinner was one of the most controversial intellectual figures of the late twentieth century. He stirred a hornet's nest by repeatedly insisting that external influences (not internal thoughts and feelings) shape behavior. Despite strong opposition, Skinner maintained that position until the very end of his life. Skinner's daughter, Julie S. Vargas, has provided a moving account of her father's last days. You may choose to share aspects of her account with your class.

Vargas reports how eight days before his death from leukemia, B. F. Skinner received the first APA Citation for Outstanding Lifetime Contribution to Psychology. It was given at the opening session of the American Psychological Association's 98th Annual Convention on August 10, 1990, in Boston. Vargas notes the circumstances:

The association officials had assured the family that they would keep my father from crowds—important because of his heightened susceptibility to infection from leukemia—and they kept their word. At 1:00 o'clock on August 10th, a limousine appeared at the Skinner home to drive our party to the convention hotel. There we were met and ushered upstairs in our own elevator to a hotel room, "like movie stars," my father remarked. A few minutes before the opening session was to begin, we were ushered back downstairs and taken by a back way to the side door of the auditorium. I was holding my father's arm as we entered. The room was packed. A second room to the side had been opened and it, too, was overflowing. When we had taken two steps into the room everyone stood up and began to applaud. My father made an awkward nod of his head in acknowledgement as he continued walking—I could tell he hadn't expected such a reception. The applause was thunderous. It continued as my father made his way up the steps. It continued, undiminished, as my father was escorted across the stage to his chair. He turned around and made a gracious bow of his head, but there was no sign of the applause letting up. Finally APA officials interrupted the applause and started the program. After 50 minutes of preliminaries, it was time for my father to accept the award. [Source: Vargas, J. S. (1990). B. F. Skinner—The last few days. *Journal of Applied Behavior Analysis*, 23, 409.]

Vargas reports how her father used no text or notes but talked smoothly, using names and dates most others would have had trouble remembering. His talk finally turned to the split in psychology, "one part going in the direction of finding out the essence of feeling, the essence of the cognitive process, and the other going in the direction of references to contingencies of reinforcement." Skinner drew a parallel between the difficulty people had in accepting Darwin's concept of natural

selection and the difficulty many psychologists had in accepting his own concept of selection by consequences. He concluded with the statement, "So far as I'm concerned, cognitive science is the creationism of psychology." The statement elicited an audible gasp from the audience. Only a sprinkling of clapping was heard. As he had planned, Skinner concluded his statement in just over 15 minutes. He was escorted down the steps (once again to applause) and left the auditorium.

The following weekend Skinner worked on the paper from which his remarks had been taken. It was to be published in *American Psychologist*, and he was eager to finish it. After interviews early in the following week, including one for a TV newscast, he entered the hospital for the last time on Wednesday afternoon. The day before he died he worked on the last changes in his paper for *American Psychologist*. As a member of the Hemlock Society, he believed in the right to take one's own life. He refused final "heroic" lifesaving effects that could have prolonged the functioning of his organs. Near the end, reports Vargas, his mouth was dry. After taking a sip of cold water, he said his last word, "Marvelous."

Vargas, J. S. (1990). B. F. Skinner—The last few days. *Journal of Applied Behavior Analysis*, 23, 409–410.

## Examples and Demonstrations of Operant Conditioning

*Lecture/Discussion Topic: Examples of Negative Reinforcement*

The difficult concept of negative reinforcement can probably be taught best with a series of relevant illustrations. In recognizing that examples of positive reinforcement and punishment are easier to generate than those of negative reinforcement, Miguel Roig and Carolyn Greco-Vigorito provide a catalog of the latter to be used in introductory psychology. In introducing the examples that follow, you might first review the two kinds of reinforcers. Positive reinforcers strengthen a response by presenting a positive stimulus after a response. Negative reinforcers strengthen a response by reducing or removing an aversive (unpleasant) stimulus. Then, as you go through the list, ask students to identify the aversive stimulus and the behavior being strengthened by its removal.

1. Taking aspirin to relieve a headache.
2. Hurrying home in the winter to get out of the cold.
3. Giving in to an argument or to a dog's begging.
4. Fanning oneself to escape the heat.
5. Leaving a movie theater if the movie is bad.
6. Smoking in order to relieve anxiety.
7. Following prison rules to be released from confinement.
8. Feigning a stomachache to avoid school.

9. Putting on a car safety belt to stop an irritating buzz.
10. Turning down the volume of a very loud radio.
11. Putting up an umbrella to escape the rain.
12. Saying “uncle” to stop being beaten.

You can also find some instructive tutorials online to demonstrate the differences between positive and negative reinforcement. For example, Negative Reinforcement University ([www.mcli.dist.maricopa.edu/proj/nru/nru\\_vl/index\\_ns.html](http://www.mcli.dist.maricopa.edu/proj/nru/nru_vl/index_ns.html)) is a virtual experience in which learners can “attend” a lecture on negative reinforcement and then try some “laboratory” activities that demonstrate the principle. A nice self-instructional tutorial on positive reinforcement has been posted online by Canada’s Athabasca University at <http://psych.athabascau.ca/html/prtut/>. In the second part of the exercise, students can gauge their understanding of the concept by classifying 14 examples and nonexamples of positive reinforcement.

#### *Classroom Exercise: Partial Reinforcement Schedules*

Students can apply their knowledge of partial reinforcement schedules with Handout 6. After reviewing the four major schedules, you can use the handout for individual review, as a small group exercise, or for full class discussion. The answers are: 1. VR 2. FR 3. VI 4. FI 5. VI 6. VR 7. FI 8. FR 9. VR 10. VI 11. FR 12. FI.

#### *Student Project/Classroom Exercise: Conditioning the Instructor’s Behavior*

Fables about students conditioning their instructors’ behaviors are legion. You have perhaps heard and even retold to your class how students shaped their teacher to stand only in one corner of the room or face in one direction. W. Lambert Gardiner tells, tongue in cheek, how one class laughed more uproariously at their instructor’s jokes as he moved toward the right side of the room until they were able to condition him right out the door. Joan Chrisler has used these conditioning stories as the basis for a student project in her psychology of learning course. It can readily be adapted to introductory psychology.

After your students have had an opportunity to observe you teach, suggest that they choose a specific behavior for conditioning. Ask them to select something that will improve your teaching or be helpful to you, not something obscene or embarrassing. Tell them that they will be given about 30 minutes of class time to prepare their project. Before leaving, appoint a discussion leader and briefly outline what the students are to do. After deciding on the specific behavior to condition, they should take a baseline over a few class periods. (Let them decide precisely how many.) The conditioning process (involving any reinforcer of their choice)

should continue over, say, a few weeks. They should carefully assess any change in the frequency of the behavior being conditioned. If you like, they might also include a period during which they stop conditioning, again assessing any behavioral change. They are to end the project by debriefing you, their subject.

Chrisler reports that she is always surprised by the results, even when the class has not been successful in conditioning her behavior. Even when unsuccessful, students value the experience, typically realizing themselves what went wrong. Shaping is not always as easy as it seems. The successes include making eye contact with all class members, moving about the classroom more frequently, giving more examples from personal experience to illustrate concepts, and writing on the chalkboard more often. Powerful reinforcers include eye contact, smiling, nodding, note taking, and class participation.

Chrisler, J. (1988). Conditioning the instructor’s behavior: A class project in the psychology of learning. *Teaching of Psychology, 15*, 135–137.

### **Applications of Operant Conditioning**

#### *Lecture/Discussion Topic: Shaping HeroRATS to Detect Land Mines and Tuberculosis*

In discussing shaping, you can describe research by Bart Weetjens, who founded APOPO (a Flemish acronym for “product development geared toward the demining of antipersonnel mines”) in response to the global land mine problem. From his experience with rats as childhood pets, Weetjens knew that, with their terrific sense of smell and trainability, the animals could provide a cheap, efficient, and often locally available means to detect land mines. Now called HeroRATS, these sniffer rats are used to detect explosives and diagnose disease.

On average, it takes 10 to 12 months to fully train a rat for mine-sniffing (a banana reward is used). “The training is very simple,” said Weetjens. “We associate a food reward with a target scent.” Successfully trained rats indicate mines by pointing their noses directly at the ground for more than five seconds. The rats wear harnesses and run along strings stretched across the suspected area. Weighing only 6 pounds, the giant rats, in contrast to dogs, are too light to trip the mines by accident. In a test along a southern Mozambique railway that was heavily mined during the 17-year civil war, teams of three giant pouched rats found every one of 20 live mines in a previously unsurveyed 4300-square-foot swatch of land. The animals’ amazing success is likely to lead to their use in other regions in Africa, Asia, and Europe where millions of mines that remain buried from previous wars kill and maim thousands of people each year.

In Tanzania, HeroRATS are sniffing saliva samples for traces of tuberculosis. The rats can identify the disease because of the distinct smell of the chemicals in infected specimens. In fact, the animals are able to identify early-stage infections that may not be found by a microscope. Furthermore, they do it quickly. In 7 minutes, one rat can evaluate 40 samples; a lab technician using a microscope would need 2 days to complete the work. In Africa, the rats can be picked up from the bush and bred. Although the training is time-consuming, it is not expensive. The rats sniff a series of holes under which human sputum samples are lined up for evaluation. As with the location of land mines, the animals are able to pinpoint the samples that contain tuberculosis bacteria. They are rewarded with a food treat for correctly identifying an infected specimen. Being able to identify tuberculosis quickly and accurately is certain to help many countries in their attempt to control the disease. See [www.herorat.org](http://www.herorat.org) for more detailed information on the use of rats in locating land mines and detecting tuberculosis.

(2008, December 12). Our new friend, the rat. *The Week*, p.22.

*Lecture/Discussion Topic: Dolphins Clear Mines in Persian Gulf*

The U.S. Navy has deployed dolphins (called “marine mammal systems”) to hunt down mines. Such mine clearance has been necessary to ensure the safety of U.S. ships. The Navy program has as many as 80 Atlantic bottlenose dolphins and 30 California sea lions in the Marine Mammal Program since it began. They were first used in the Vietnam War, when dolphins were brought in to help protect an Army ammunition pier in Cam Ranh Bay that had been repeatedly blown up during the Vietnam War. The dolphins “were in Vietnam for six months. The pier was never blown up while they were there,” Tom LaPuzza, spokesman for the program, said. “As soon as they left, it was.” They have also been used in Operation Desert Storm for “swimmer defense,” in Bahrain in 1987 to protect a U.S. flagship, and at the 1996 Republican National Convention in San Diego. The dolphins were trained to search for scuba divers who were trying to plant explosives on Navy vessels. The animals have always been positively reinforced with fish. Remarkably, one of the animals has worked in the program for more than 30 years.

The dolphin’s sonar is so sensitive that it can detect a metal disc the size of a quarter 100 feet away. In the Persian Gulf, a Navy handler in an inflatable boat signals the dolphin to dive. The dolphin then begins using its echolocating sonar to search for mines and, on locating one, returns to the boat and touches a rubber disc at the bow. The handler places a nose cup that is attached

to a plastic cylinder over the dolphin’s snout. The dolphin swims to the mine and removes the nose cup, which is spring-loaded. The cylinder opens, an anchor falls to the bottom, and a float attached to a rope rises to the surface, marking the location of the mine. Navy divers then retrieve it. The dolphins are trained to avoid touching the mines.

Although animal rights groups have criticized the Navy’s use of dolphins since its Marine Mammal Program began with a single female Pacific white-sided dolphin, survival rates over the past decade have been 95 to 97 percent, higher than that of any other group holding captive dolphins, including academic centers and Sea World.

More recently, the program has been testing whether these sea mammals can be used to help thwart a terrorist attack. In May 2010, the team simulated a terrorist attack at ports throughout California. The drills included a fake attack on a container ship at the Port of Oakland, a bomb explosion at the Port of Redwood City, and terrorist attacks in waters off Los Angeles, Long Beach, Sacramento, and San Diego. A dolphin quickly located a terrorist lurking in the black water before a sea lion, using a device carried in its mouth, cuffed the pretend saboteur’s ankle so authorities could reel him in.

Friend, T. (March 27, 2003). A wartime first: Dolphins called to clear mines. *USA Today*, p. 8D.

Associated Press. Sea lions, dolphin join terror exercises. (2010, May 19). Retrieved June 8, 211, from [www.military.com/news/article/sea-lions-dolphin-join-terror-exercises.html?ESRC=eb.nl](http://www.military.com/news/article/sea-lions-dolphin-join-terror-exercises.html?ESRC=eb.nl).

Mine-detecting dolphins used in California terror drill. (2010, May 19). Retrieved June 7, 2011, from <http://publicintelligence.net/mine-detecting-dolphins-used-in-california-terror-drill>.

*Classroom Exercise: Consideration of Future Consequences Scale*

Immediate reinforcement is powerful. Shaping studies with animals indicate that even with a delay of only 30 seconds, virtually no learning may occur. The immediacy of reinforcement influences human behavior as well. For example, the immediate gratification of passionate, unprotected sex prevails over the delayed gratifications of safe sex or saved sex. Part of maturity is learning to delay gratification. An excellent resource on this topic is A. W. Logue’s *Self-Control: Waiting Until Tomorrow for What You Want Today*.

Walter Mischel has argued that the ability to delay gratification is a basic personality competence that remains reasonably stable throughout life. Handout 7, designed by Alan Strathman and colleagues, is the Consideration of Future Consequences Scale. It

measures our tendency to consider potential distant outcomes of current behaviors as well as the tendency for current behaviors to be influenced by these potential distant outcomes. In scoring their own scale, students should reverse the numbers they gave in response to statements 3, 4, 5, 9, 10, 11, and 12 (i.e., 1 = 5, 2 = 4, 3 = 3, 4 = 2, 5 = 1). Then they should total the numbers in front of all 12 items. Total scores can range from 12 to 60 with higher scores reflecting greater consideration of future consequences. Students in an introductory psychology course at the University of Missouri obtained a mean score of 42.5.

Research suggests that greater consideration of future consequences is positively linked to conscientiousness, optimism, hope, and an internal locus of control. Higher scores were also positively related to general concern for health, and negatively related to cigarette and alcohol consumption. Those with higher scores were also more likely to be environmentally conscientious by recycling, driving a fuel-efficient car, and using a water-saving shower head.

Logue, A. W. (1995). *Self-control: Waiting until tomorrow for what you want today*. Upper Saddle River, NJ: Prentice Hall.

Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66, 742–752.

#### Lecture/Discussion Topic: Superstitious Behavior

Skinner's research on "superstitious" behavior in pigeons can be presented in class to illustrate both the power of reinforcement and its application to everyday life. According to Skinner, a superstitious behavior is a response that is accidentally reinforced—that is, there is no prearranged contingency between the response and reinforcement. Because the behavior and reinforcement occur together, the behavior is repeated and, by chance, is again followed by reinforcement. This process may explain why we carry a half dollar as a good luck piece, wear the same cargo pants when taking tests, and step over cracks in the sidewalk.

In one study, Skinner placed hungry pigeons in a Skinner box where food was presented for five seconds at regular intervals. The food was made available regardless of the pigeon's behavior. Six of the eight pigeons exhibited "superstitious" behavior. One pigeon happened to be turning counterclockwise when the food was presented early in the experiment, and so it would reliably turn two or three times in a counterclockwise direction between reinforcements. A second bird received food after thrusting its head into one of the upper corners of the cage. Two other pigeons learned to swing their upper bodies in a pendulum motion.

Skinner reported that a 15-second interval between reinforcements was ideal for the development of these superstitious behaviors. Longer intervals decreased the likelihood that the same behavior would occur at the time of the next reinforcement. Shorter intervals limited the number and kinds of behaviors that might precede reinforcement. In such cases, only the response "head lowered in front of the cup entrance (food dispenser)" was likely to be reinforced.

Skinner, B. F. (1972). "Superstition" in the pigeon. In B. F. Skinner (Ed.), *Cumulative record: A selection of papers* (3rd ed.). New York: Appleton-Century.

#### Classroom Exercise: The Sensitivity to Punishment and Sensitivity to Reward Questionnaire

Are some of us more sensitive than others to punishment? Is the same true for rewards? Handout 8 is the Sensitivity to Punishment and Sensitivity to Reward Questionnaire. For assessing sensitivity to punishment, respondents score one point for a "yes" to each of the odd-numbered items. For assessing sensitivity to reward, respondents score one point for a "yes" answer to each of the even-numbered items. Thus for each scale, scores can range from 0 to 24, with higher scores reflecting greater sensitivity to punishment or reward, respectively.

You can use this scale to introduce Jeffrey Gray's *reinforcement sensitivity theory*. Gray hypothesizes the existence of two biological systems in the brain: the *behavioral activation system* (BAS), which responds to rewards and regulates approach behavior, and the *behavioral inhibition system* (BIS), which responds to punishments and regulates avoidance behavior. As Randy Larsen and David Buss suggest, the BAS is much like an accelerator that motivates approach behavior and the BIS is like brakes that stop behavior. They report recent research in which participants were either rewarded for correct responses or punished for incorrect responses on a challenging reaction time task. As hypothesized, BAS scores predicted performance in the reward condition, while BIS scores predicted performance in the punishment condition.

According to Gray, people vary in the relative sensitivity of their BIS and BAS systems. A person with a highly reactive BIS is especially sensitive to threat and punishment and thus is vulnerable to *anxiety*. On the other hand, a person with a highly reactive BAS is especially sensitive to incentive and reward and thus is vulnerable to *impulsivity*.

For example, differences in BIS sensitivity may lead students to react differently to poor performance on a test. A person with high sensitivity may be in a panic, while a person with low sensitivity may be hardly bothered at all. Similarly, differences in BAS



sensitivity may lead two individuals to react differently in anticipating an enjoyable event such as attending a concert. One with high sensitivity may get euphoric in thinking about the prospect of going, while one with low sensitivity may know she'll enjoy the event but remains relatively calm in anticipating it.

Threat sensitivity and incentive sensitivity are thought to be separate systems. As a result, all combinations of high and low BAS and BIS sensitivity exist.

Carver, C. S., & Scheier, M. F. (2004). *Perspectives on personality* (5th ed.). Boston: Allyn & Bacon.

Gray, J. A. (1972). *The psychology of fear and stress*. New York: McGraw-Hill.

Larsen, R. J., & Buss, D. M. (2008). *Personality psychology: Domains of knowledge about human behavior* (3rd ed.). New York: McGraw-Hill.

Larsen, R. J., Chen, B., & Zelinsky, J. (2003). *Responses to punishment and reward in the emotion Stroop paradigm: Relations to BIS and BAS*. Unpublished manuscript.

Torrubia, R., Avila, C., Moltó, J., & Caseras, X. (2001). The sensitivity to punishment and sensitivity to reward questionnaire (SPSRQ) as a measure of Gray's anxiety and impulsivity dimensions. *Personality and Individual Differences*, 31, 837–862.

#### Lecture/Discussion Topic: Physical Punishment

Robert Larzelere and Brett Kuhn describe different perspectives on physical punishment. One is an unconditional antispanking perspective advanced by social scientists and advocacy groups. For example, Human Rights Watch and the American Civil Liberties Union issued a report encouraging the end of all physical punishment in schools. "It's just fundamentally ineffective in terms of improving school discipline," argued Alice Farmer, the report's author. "It doesn't teach kids why what they did was wrong; it doesn't show them better behavior. What it does is teach them to be violent." The report notes that in the 2006–2007 academic year, school personnel reported disciplining 223,190 students by hitting, spanking, or other physical means. Interviews indicated that children in Mississippi and Texas were routinely paddled for "minor infractions" such as chewing gum or violating school dress codes. The report also indicated that corporal punishment disproportionately targets minority students. Farmer states that corporal punishment is now banned in 29 states and 106 countries.

The other position, the conditional-spanking perspective, attempts to identify conditions under which spanking may be beneficial or at least not detrimental to children.

Larzelere and Kuhn's meta-analysis comparing the impact of physical punishment with alternative disciplinary strategies extends any discussion of punishment.

Because earlier reviews lumped together nonabusive and severe forms of physical punishment, the authors distinguish between four types of physical punishment investigated in research studies. *Conditional* spanking is defined as physical punishment that is used to back up milder disciplinary tactics (e.g., reasoning or time-out), for defiance, or punishment that is used in a controlled manner. *Customary* physical punishment represents the manner in which parents typically use physical punishment. The purpose of this category was to determine whether typical use of physical punishment is associated with better or worse outcomes than alternative tactics. *Overly severe* physical punishment is the use of excessive force, including hitting with an object, shaking, or face slapping. *Predominant use* of physical punishment indicates that physical punishment is the parent's primary disciplinary method, that is, it is preferred over milder disciplinary tactics.

In examining the outcomes from 26 qualifying studies, the investigators found that conditional spanking was more effective than 10 of 13 alternative disciplinary tactics for reducing children's noncompliance or antisocial behavior. Customary physical punishment was *equally* effective as alternative tactics, except in one large study that actually favored physical punishment over other strategies. Only severe or predominant use of physical punishment compared unfavorably with alternative disciplinary tactics. The authors conclude that there is a "need for better discriminations between effective and counterproductive use of disciplinary punishment in general."

Human Rights Watch and American Civil Liberties Union (2008, August 19). A violent education: Corporal punishment of children in U.S. public schools. Retrieved August 21, 2008, from [www.aclu.org/intlhumanrights/gen/36476res20080819.html](http://www.aclu.org/intlhumanrights/gen/36476res20080819.html).

Larzelere, R. E., & Kuhn, B. R. (2005). Comparing child outcomes of physical punishment and alternative disciplinary tactics: A meta-analysis. *Clinical Child and Family Psychology Review*, 8, 1–37.

#### Lecture/Discussion Topic: Using Reinforcement Versus Punishment in the Classroom

In his excellent book *The Power of Reinforcement*, Stephen Ray Flora illustrates the superiority of reinforcement over punishment even in teaching children the spelling of a simple word. You may want to present the following three hypothetical teacher-student interactions from Flora's book in class (p. 136):

Teacher: "Spell 'cat'."

Student: "k-a-t."

Teacher: "No, wrong."

In this example, suggests Flora, the teacher punishes both the student's incorrect spelling and effort. The

student is provided no incentive to continue and may be at risk for developing learned helplessness.

Teacher: "Spell 'cat'."

Student: "k-a-t."

Teacher: "Nice try! That is very close! Please try again."

In this interaction, the teacher identifies the incorrect spelling and reinforces the effort. The student is likely to try again. However, the teacher has not identified what part of the answer is incorrect. The student's next spelling might be "k-a-c," "c-e-t," or "k-a-f." Slow progress may frustrate both teacher and learner.

Teacher: "Spell 'cat'."

Student: "k-a-t."

Teacher: "Nice try! That is very close! Can you think of another letter that makes the 'ka' sound?"

Student: "c"?

Teacher: "That's right! Now, spell 'cat'"

Student: "c-a-t!"

Teacher: "Super! Now spell 'cat' again."

Student: "c-a-t."

Teacher: "Great! 'C-a-t' spells cat. Give yourself another point."

In this final example, the teacher (1) prompted the student to spell, (2) identified the incorrect spelling and reinforced the child's effort, (3) identified the location of the error and encouraged error correction, (4) reinforced error correction and prompted spelling again, (5) reinforced the correct spelling a second time and repeated the correct spelling.

"As this example illustrates," concludes Flora, "even teaching the spelling of a simple word may require many embedded instructor-provided reinforcements. Effective teaching of any subject requires copious reinforcement embedded in a lesson coupled closely to student behavior."

Flora, S. R. (2004). *The power of reinforcement*. Albany, NY: State University of New York Press.

#### *Classroom Exercise: Assessing Self-Reinforcement*

Self-management typically involves the identification and application of positive reinforcers to some specific behavior such as exercise or losing weight. Elaine M. Heiby's Frequency of Self-Reinforcement Questionnaire (FSRQ) used to assess self-reinforcement as a generalized response set can be found in the Therapy unit in these resources. You may prefer to use it in relation to the application of operant conditioning techniques. Heiby defines self-reinforcement as "the process of establishing and controlling overt and covert positive consequences of one's own behavior."

#### *Lecture/Discussion Topic: Beyond Freedom and Dignity*

Few issues will stimulate a more lively classroom debate than B. F. Skinner's statements regarding human freedom and dignity. Ask your students whether our beliefs in human freedom and dignity are illusions. Also ask whether beliefs are obstacles to the development of a better society.

Skinner argued that denial of the fact that we are controlled by our environment leaves us vulnerable to control by subtle and malignant circumstances and by malicious people. Governments and political leaders, he contended, may seek to control us for their own benefit rather than serve our best interest. Recognizing that behavior is shaped by its consequences is the first step in taking control of the environment and ensuring that it delivers consequences promoting desirable behavior. When we demand freedom, argued Skinner, what we really mean is freedom from *aversive* consequences and not freedom to make choices. In the final analysis, we can have "freedom" but only by arranging our own consequences and not by leaving it to "fate" or the "government."

For Skinner, "dignity" was also an illusion. "We recognize a person's dignity or worth," he argued, "when we give him credit for what he has done." We tend to do this when we are unable to readily identify the environmental factors that control another's behavior. When a person makes an anonymous charitable donation, for example, we may attribute it to something inside the person, to his or her "altruism." To credit people for doing good is to ignore the environmental factors that give rise to "good" behavior. Something in the person's formative years has obviously shaped the desirable behavior. Only by identifying the external factors that gave rise to "doing good" can we bring them under control so that more people will do good more often. This movement toward a better society demands giving up the belief in "dignity." Did Skinner practice what he preached? Yes, as you can see here:

And now my labor is over. I have had my lecture. I have no sense of fatherhood. If my genetic personal histories had been different, I should have come into possession of a different lecture. If I deserve any credit at all, it is simply for having served as a place in which certain processes could take place. I shall interpret your polite applause in that light.

Allen, B. (2000). *Personality theories: Development, growth, and diversity* (3rd ed.). Boston: Allyn & Bacon.

Skinner, B. F. (1971). *Beyond freedom and dignity*. New York: Knopf.

*Lecture/Discussion Topic: Financial Incentives to Quit Smoking*

You can extend your description of the applications of operant conditioning to a recent study that showed financial incentives help smokers quit the habit. Kevin Volpp, director of the Center for Health Incentives at the University of Pennsylvania, and his research team worked with nearly 900 smokers employed by General Electric in the United States to help them quit the habit. All the research participants receive information about local smoking-cessation classes and the company's coverage of drugs designed to help them quit smoking. Half were also offered financial incentives. The financial incentives were \$100 for completion of a smoking-cessation program, \$250 for being smoke-free after six months (as confirmed by a biochemical test), and \$400 for being smoke-free after a year (again, as confirmed by a biochemical test). Careful assessment indicated that each group had about the same number of heavily addicted smokers.

Results indicated that after a year, 15 percent of those provided incentives were smoke-free, whereas only 5 percent of those in the information-only group were smoke-free. Lead researcher Volpp notes that "People are drawn to tangible things. It makes it easier for you to do in the short term what you know is in your best interest." Volpp also noted that smokers need all the help they can get. Although 70 percent of smokers indicate that they want to quit, only 3 percent succeed each year. The low cessation rates in the current study, even with incentives, emphasize how hard it is to quit. Given that the incentives paid for themselves in about three years, GE plans to continue the smoking-cessation program in the coming years.

Tom Glynn, Senior Director of the American Cancer Society who was not involved in the study, observed that tobacco taxes also provide strong incentives to quit. Research suggests that each 10 percent increase in the cost of cigarettes reduces the teen smoking rate by 7 percent and the adult rate by 4 percent.

Szabo, L. (2009, February 12). Financial incentives can help smokers quit. *USA Today*, p. 6D.

Volpp, K. G., Troxel, A.B., Pauly, M.V., et al. (2009). A randomized, controlled trial of financial incentives for smoking cessation. *New England Journal of Medicine*, 360, 699–709.

*Lecture/Discussion Topic: Transforming Couch Potatoes With Operant Conditioning*

Psychologist David Allison of Columbia University College of Physicians and Surgeons reported a nifty application of operant conditioning principles to both weight control and leisure management in children. Presenting at the Experimental Biology meeting in

Washington, DC, in April 1999, Allison described how his team successfully got overweight, sedentary children moving while watching TV.

The researchers wondered what would happen if kids had to ride a stationary bicycle to keep the television on. So they created TV-cycles and randomly assigned overweight 8- to 12-year-olds to two conditions. In one condition, children had to pedal to keep the TV on. In the second condition, a bicycle was present but not necessary for the TV's operation. Results? Children who had to pedal to watch TV biked an average of an hour a week, while the others biked an average of only eight minutes. The treatment group watched one hour of TV per week, while the controls watched 20 hours. Equally significant was the finding that the treatment group significantly decreased overall body fat.

"This was a non-nagging approach to get kids to exercise," claimed Allison. "We told parents just to let the bicycle do the work." One problem, however, was that it was difficult on parents themselves not to be able to watch TV. They had to find ways to occupy their kids!

Hellmich, H. (1999, April 19). Pedaling a solution for couch-potato kids. *USA Today*, p. 1D.

*Lecture/Discussion Topic: Remote-Controlled Rats*

Sanjir Talwar and colleagues at the State University of New York, Downstate Medical Center, Brooklyn, reported a fascinating application of operant conditioning principles. The researchers implanted tiny stimulating electrodes into the brains of five rats and then used a laptop computer to guide them over obstacles and through mazes. "Our rats," report the research team, "were easily guided through pipes and across elevated runways and ledges, and could be instructed to climb or jump." They were even able to lead the rats over piles of rubble and through bright, open fields—an environment rats normally avoid. Such remote-controlled rats may eventually serve as "living robots" for land-mine detection and search-and-rescue missions after a disaster or terrorist attack. For example, a rat fitted with a microphone and video camera could be directed to where people are believed to be buried alive.

How does this all work? The researchers planted electrodes in two regions of the rat's brain: the somatosensory cortex, which receives signals when the rat's whiskers brush against something, and the medial forebrain bundle, whose activation produces reward signals. A tiny electronic backpack on top of each rat took signals from the laptop that was up to 500 feet away. When the left somatosensory cortex was stimulated, the rat interpreted it as a signal that something had brushed its right whiskers and it immediately turned right. Similarly, activating the right somatosensory cor-

tex made the rat turn left. After the rat made the correct turn, the researchers activated the electrode in the rat's reward center, thereby delivering positive reinforcement.

Linda Hermer-Vazquez has shown that exposing rats to an odor while stimulating the medial forebrain (in effect, delivering a reward) also causes them to act like sniffer dogs. Eventually, they seek out the smell of an explosive or drug because of its prior association with reward. Equally important, the studies have demonstrated that the two behaviors (i.e., controlling the rat's movements and its sniffing out a specific target odor) are compatible. Interestingly, the experiments also show that rats trained through direct electrode stimulation of the brain are better at locating an object by smell than those trained using food. The rats remained highly motivated to seek out the odors even six weeks after electrode training.

Friend, T. (2002, May 2). Brain-wired rats are at our command. *USA Today*, p. 9D.

Hermer-Vazquez, L., et al. (2005). Rapid learning and flexible memory in "habit" tasks in rats trained with brain stimulation reward. *Physiology and Behavior*, *84*, 753–759.

#### *Classroom Exercise: A Token Economy*

You can extend the text discussion of operant conditioning at school by replicating Kurt Boniecki and Stacy Moore's use of a token economy to reinforce classroom participation in an introductory psychology course. Although you can simply describe Boniecki and Moore's study to show how operant conditioning has been used at the college or university level, you might also choose to implement their token economy in your own classroom. The researchers conducted their study over the final 11 class meetings of the term.

In their study, an introductory psychology instructor periodically directed relevant questions to the class, and students who wanted to answer the questions raised their hands. The instructor called on students in the order they raised their hands until one answered correctly. If no one raised his or her hand within 60 seconds, the instructor presented the answer and continued with the lecture. The first 4 of the 11 class sessions provided the baseline of student participation. Over the next four class meetings, the instructor implemented the token economy by announcing that the first person to answer a question correctly would receive a token. The tokens were wooden checker pieces purchased from a local hobby store—heavy enough to toss, but light enough not to injure. At the end of each class meeting, students could exchange each token for one point added to their next exam grade. During the final three class sessions, the token economy was discontinued and students were debriefed about the study.

For all 11 sessions, a research assistant, posing as a student in the last row of the classroom, recorded the number of students who raised their hands in response to a question, the amount of time until the first hand was raised, and the number of times any student spontaneously asked the instructor a question or engaged the instructor in discussion. On all three measures, classroom participation increased during the token economy and decreased after its removal. Participation rates during the baseline and after removal were not significantly different.

Boniecki, K. A., & Moore, S. (2003). Breaking the silence: Using a token economy to reinforce classroom participation. *Teaching of Psychology*, *30*, 224–227.

#### *Student Project: Modifying an Existing Behavior*

Ask students if they would like to change one of their behaviors. Perhaps they want to get more exercise, lose weight, or improve their study habits. To use operant conditioning principles to establish and strengthen the desired behavior, they should follow the steps suggested below by Anthony Grasha.

1. Identify a target behavior that is important to you. Don't attempt to do too much at once but be specific. Instead of "I want to get more exercise," state "I need to start jogging one mile every day."
2. If a desirable behavior such as exercise is presently nonexistent, go to step 4. However, if it is present in limited form, or is a behavior you want to eliminate, monitor it for about a week to establish a baseline of occurrence. Behaviors can be recorded by frequency or by duration. For example, if smoking is to be decreased, count the number of cigarettes presently smoked per day. If studying is to be increased, record the number of hours presently invested daily. Also keep track of the situations in which it occurs as well as the favorable or unfavorable consequences. (Sometimes, monitoring an action will cause a change. This project can be simplified by having students merely observe their behavior and record any change.)
3. Gain control over the behavior by controlling discriminative stimuli. Some people may smoke while drinking coffee, or snack only while watching television. Giving up coffee or limiting time in front of the TV may help in changing the target behavior.
4. Identify positive reinforcers (reading a favorite magazine, telephoning a friend, taking a hot shower). Select one that is likely to influence the behavior you want to change, then use it to change your behavior. Establish a schedule of reinforcement. For example, you get to make a phone call only after you have read one chapter in the textbook, or after you have gone three hours without a cigarette.



5. If possible, enlist social support. Modifying behavior can be difficult, and so it often helps to have someone to talk with to keep you honest and committed to your plan. Grasha writes that one graduate student put \$200 into a jar and instructed her husband that for every week she failed to reach her goal in working on her dissertation, he was to send \$25 to her least favorite charity.
6. Monitor and record your progress toward changing the behavior. Remember that behavioral change takes time. Shift from continuous to partial reinforcement once a target behavior is acquired. Your goal should be to wean yourself from the control of external reinforcers.

Grasha, A. F. (1995). *Practical applications of psychology* (4th ed.). New York: HarperCollins.

*Lecture/Discussion Topic: Walden Two and the Twin Oaks Community*

Discussion of the applications of operant conditioning might well include reference to B. F. Skinner's *Walden Two*. In his book, Skinner describes an ideal community, a utopia, based on operant conditioning principles. The community has no major social problems such as crime, racism, unemployment, or poverty. Petty jealousies, boredom, and laziness have been eliminated. One of Walden Two's most attractive features is a labor credit system. With this system, labor credits replace currency as payment for work performed. Residents are not charged for goods or services, but each contributes 1200 labor credits per year. Unpleasant work has a higher credit value, and thus is not performed over long periods. Residents work an average 28-hour week.

In Walden Two, the residents share property in common, enjoy a high standard of living, and spend their leisure time performing Bach's Mass in B Minor, playing chess, or painting. Child care is communal and, for the most part, in the hands of child-rearing experts. The nuclear family does not exist. Ethical and moral conditioning is complete by age 6 and principles of reinforcement are systematically applied in the socialization of the child. For example, partial reinforcement is used to develop frustration tolerance. Beginning at 6 months of age, babies are given toys designed to develop perseverance. In order for a toy to be reinforcing, say, for a music box to play, the infant learns to pull a ring. When the infant has learned the response, the reward is delivered on a variable-ratio schedule. Without experiencing great frustration, very young children begin to build up perseverance that serves them well later in life.

Most memorable for many readers of *Walden Two* is the use of lollipops to teach self-control. Every morning preschoolers are given suckers that have been dipped in powdered sugar so that a single lick

can be detected. The children may eat the candy in the afternoon *only* if they can keep from licking it in the meantime. The child who takes a small, immediate reward sacrifices the larger, delayed reward of a whole lollipop. Frazier, the story narrator in *Walden Two*, describes the process of training.

First of all, the children are urged to examine their own behavior while looking at the lollipops. This helps them recognize the need for self-control. Then the lollipops are concealed and the children are asked to notice any gain in happiness or reduction in tension. Then a strong distraction is arranged—say, an interesting game. Later the children are reminded of the candy and encouraged to examine their reaction. The value of the distraction is generally obvious . . . when the experiment is repeated a day or so later, the children all run with their lollipops to their lockers . . . a sufficient indication of the success of our training.

While Walden Two has its own code of behavior, there is little institutionalized government. Neither a democracy nor a totalitarian state, the community is run by a six-member Board of Planners. Managers are in charge of child care, agriculture, public relations, etc. Visitors are welcome but, like residents, must work for their keep. Walden Two is composed of about 1000 members and has sister communities elsewhere.

Could Walden Two become a reality? Most students will be surprised to hear that *Walden Two* principles have been used as the blueprint for a few communities. For example, Twin Oaks, a small community founded in 1967 near Richmond, Virginia, is one of the longest-running and largest communes (Twin Oaks prefers the term "intentional community") in the country.

Located on 450 acres of farms, fields, and woods, its present population consists of 85 adults and 15 children (ranging in age from newborn to 75) who share income and property. Twin Oaks currently has space for new members. The 28-hour week proposed by Skinner hasn't yet proved practical; members work 42 hours weekly. Most of the work requires physical labor, including milking the cows. Initially Twin Oaks attempted to use a modified form of Walden Two's labor credit system—having some forms of labor worth more credit than others—but residents found this aspect of the system too divisive and dropped it.

Sources of income include hammock- and tofu-making businesses. The community also has a book-indexing service. It sells hammocks through mail order and at craft fairs. The profits go into a general budget, but each member gets a monthly stipend in spending money.

From the start, Twin Oaks' founders were determined that the community would not become a hippie hangout. In addition to making sure that everyone worked, they were specific in their plans that everyone

share clothes from a communal clothing room and that while monetary resources may be held outside the community, one cannot benefit from their use while a member. Children are cared for by their parents. Parents often make voluntary arrangements with other parents or nonparents to mind their children some of the time.

Several members are politically active in issues of peace, ecology, antiracism, and feminism. Each summer, the community is host to a “Women’s Gathering” and a “Communities Conference” where they welcome both veteran communitarians and “seekers” who are new to community living.

Although three planners (rather than the six of Walden Two) have been in charge of the community’s overall direction, residents attend open meetings to consider community issues. Candidates for planner may be vetoed by 20 percent of the full membership. Planner decisions can be overturned by a simple majority. The entire community gets to vote for or against funding for each project, whether it is starting a video library or raising chickens and goats. Unlike residents of Walden Two, most members are interested in the community’s politics, bringing a strong democratic tradition to Twin Oaks. There is no television at Twin Oaks but residents do watch videos. The community has more than a dozen public computers, all linked to the Internet.

Although Twin Oaks does not follow the principles of Walden Two to the letter, members say they try to apply Skinner’s concept of positive reinforcement in everything they do. B. F. Skinner visited the community at least twice before his death. Some years ago he reported that Twin Oaks “could very well be something close to Walden Two when it gets bigger. I think the main problem is that they’re serving as a therapeutic institution. These people come looking for something better than what they have found in the world. They get it and they grow stronger and healthier and then the world attracts them again and they go out. They’ve been cured.”

The community has 3-hour Saturday tours for \$5 from March through October and a 3-week visitor program with a sliding scale fee of \$50–\$250 based on ability to pay. An internship program introduces people to community life for 2 to 6 months. Interns live like Twin Oaks member in most ways. The mailing address is 138 Twin Oaks Road #W, Louisa, VA 23093. The phone number is 540-894-5126.

The Twin Oaks Community maintains an extensive and up-to-date website at [www.twinoaks.org](http://www.twinoaks.org). Encourage students to visit this fascinating website and prepare an oral or written report on the community.

Cordes, C. (1984, November). Easing toward perfection at Twin Oaks. *APA Monitor*, 1, 30–31.

Fishman, S. (1991, January/February). The town B. F. Skinner boxed. *In Health*, 50–60.

O’Brien, E. (1996, October 20). Is it utopia yet? *The Record*, pp. YT-1, YT-17.

Skinner, B. F. (1948). *Walden Two*. New York: Macmillan.

Twin Oaks Intentional Community: 100 People Sharing Our Lives. Retrieved August 20, 2008, from [www.twinoaks.org](http://www.twinoaks.org).

## Contrasting Classical and Operant Conditioning

### *Classroom Exercise: Conditioning Honeybees, Wasps, and Fish*

You can conclude the consideration of conditioning by providing a few fascinating examples of how the principles are currently being used to shape animal behavior. These examples will also challenge students’ understanding of associative learning and specifically of the difference between classical and operant conditioning. Present the examples and ask students to analyze the learning process. (Media reports may not always have it right. For example, ask your class: Is it accurate to call the fish trained to swim into nets “Pavlovian?” Why or why not?)

Researchers at Los Alamos National Laboratory in New Mexico and at the University of Georgia-Tifton campus report that honeybees and wasps may be useful in detecting bomb scents. Much cheaper to train and use than dogs, the insects also work well for assessing food quality and in detecting drug smuggling. In training, the insects learn to associate a specific scent with sugar water and thus with being fed. When the trained bees pick up the scent, they flick their proboscis—a tubular feeding organ that extends from the mouth. This movement is picked up by a camera and pattern-recognition software. The wasps are placed in a “Wasp Hound,” which is a small cylindrical container with a vent and a camera. When they detect the scent, they crowd by the vent, and the camera records their behavior. In a real world application, small boxes with a few air holes containing the insects might be placed outside an airplane entrance ramp or train platform. The insects’ behaviors would be carefully monitored.

Researchers at the Marine Biological Laboratory at Wood’s Hole, Massachusetts, are also developing farm-bred fish that are trained to swim back home after feeding and growing in the open sea. Black sea bass hear an underwater tone every time they are fed, conditioning them to swim toward the tone whenever it is sounded. After a few weeks of this training, claims researcher Simon Miner, “you have remote-controlled fish.” The notion is to train the bass long enough that they will recall the tone after weeks or even months of feeding in the open sea. When the tone is set off, they will swim back to an underwater cage and be caught. Even in the open sea, the fish are territorial and thus tend not to swim that far from home. If the plan is suc-

cessful, aquaculturalists could raise better-tasting fish, the researchers suggest, inexpensively and with less food and waste. The popular press applied the term “Pavlovian fish” to the project.

Hall, M. (2005, December 27). Scientists recruit wasps for war on terror. *USA Today*, p. 2A.

Training a fish to come home. (2008, April 11). *The Week*, p. 22.

Vergano, D. (2006, November 26). Honeybees join the bomb squad. *USA Today*, p. 7D.

*TV Episode: The Office: Jim Conditions Dwight* (1:10 min.)

A very short (70 seconds) and funny clip from the popular television series *The Office* challenges students’ ability to apply associative learning principles as well as their understanding of the difference between classical and operant conditioning. Available on DVD (and perhaps still at YouTube), the clip appears in Season 3 at the opening to Episode 16, titled “Phyllis’s Wedding.” In the episode, Jim describes his little “experiment” with Dwight as an application of Pavlovian conditioning. You might ask your students whether Jim’s analysis is accurate.

Each time Jim reboots his computer and it makes the patented bell sound, he offers Dwight (who sits at a desk directly across from him) an Altoid. The sounding of the bell, the presentation of the Altoid, and Dwight’s reaching out his hand occurs many times. Eventually, Jim reboots his computer, the bell sounds, but he offers no Altoid. Dwight automatically extends his hand and Jim asks, “What are you doing?” Appearing quite embarrassed, Dwight simply states, “My mouth tastes so bad all of a sudden . . . .”

## Biology, Cognition, and Learning

*Lecture/Discussion Topic: Biological Predispositions*

In 1924, John D. Watson stated: “The importance of stimulus substitution or stimulus conditioning cannot be over-rated . . . so far as we now know . . . we can take any stimulus calling out a standard reaction and substitute another stimulus for it.” Richard Nisbett and Lee Ross note that few hypotheses in psychology have ever been so amply disconfirmed, although it took nearly four decades of research for investigators to realize it.

Watson himself was among the first to find refuting evidence. Although he and Rosalie Rayner successfully conditioned Little Albert to fear a rat by pairing the rat with a loud noise, other experiments in their lab were not so successful. One of Watson’s students tried pairing a block of wood, as well as a cloth curtain, with noise, but conditioning failed to occur.

John Garcia was the person most responsible for challenging the prevailing behaviorist view. In addition to the results of the taste-aversion studies cited in the text (in which rats, sickened as late as several hours after tasting a distinctive flavor, learned to avoid that flavor), Garcia found that if rats were made ill several hours after eating a food of *familiar taste but unfamiliar shape*, they did not show subsequent avoidance of the differently shaped food. If, however, the rats were shocked immediately after eating the differently shaped food, they learned to avoid eating food of that shape. If they were shocked immediately after eating food having a *new taste*, they did *not* learn to avoid that food. The rats were obviously predisposed to learn that distinctive taste cues when followed by delayed gastric distress should be considered suspect, and that distinctive spatial cues when followed by immediate somatic pain should be considered suspect. To summarize:

1. unfamiliar taste — delayed illness — avoidance
2. familiar taste and unfamiliar shape — delayed illness — no avoidance
3. unfamiliar shape and immediate shock — avoidance
4. unfamiliar taste and immediate shock — no avoidance

Additional research replicated and extended Garcia’s findings, providing many examples of differential preparedness to learn certain associations. For example, rats show more fear of a gradual light onset followed by a gradual shock onset than of a gradual light onset followed by a sudden shock onset. Similarly, they show more fear of a sudden light onset followed by a sudden shock onset than of a sudden light onset followed by a gradual shock onset. Rats seemed primed to learn that sudden things are signaled by sudden things and gradual things by gradual things. Finally, a rat can be taught in a single trial to avoid shock from a grid floor if it can escape to a smooth black floor. However, if the compartment to which it must escape has a grid floor continuous with that of the shock compartment, it takes approximately 10 trials for the rat to learn the avoidance response. As Nisbett and Ross observe, the rat is predisposed to assume (and quite reasonably) that the grid floor is the cause of its pain and does not readily form the hypothesis that merely changing compartments will eliminate the pain.

Konner, M. (1982). *The tangled wing*. New York: Holt, Rinehart and Winston.

Nisbett, R., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Upper Saddle River, NJ: Prentice Hall.

*Classroom Exercise: Human Taste Aversions*

Taste aversions are particularly good for illustrating classical conditioning. Perhaps you can share one of your own and explain it in terms of conditioning principles. For example, I tell my students of my aversion to commercially produced frozen chicken dinners. Some years ago, I stored a dinner in the freezer compartment of our department's refrigerator. When I went to retrieve it, I found it in the company of a frozen laboratory rat. I learned that a student assistant, not knowing how to dispose of the deceased animal, had carefully packaged it in plastic and temporarily placed it in the freezer. Not only was I unable to eat the dinner in the freezer, but I now find all such dinners repulsive. If asked, students are sure to volunteer aversions of their own.

Psychologist Paul Rozin states, "Many people find slimy foods upsetting or anything with mucoid texture." This is an example of what he calls "secondary disgust," disgust for something that looks or feels similar to something disgusting in its own right. Rozin notes how research participants in one of his experiments were presented with two pieces of chocolate fudge, one shaped to look like a muffin, the other a replica of dog droppings. Guess which one participants avoided.

Ask your students to react to the following tasteful situations described by Rozin. Then, compare their responses with those of Rozin's 143 participants. Students should respond on a 9-point scale from 1 = dislike extremely through 5 = neutral to 9 = like extremely.

For the first four questions, dream up a bowl of your favorite soup, one that would score an unqualified 9.

1. Now imagine that the soup was served to you in an ordinary bowl, but had been stirred by a thoroughly washed, used flyswatter. How much would you like to eat that soup?
2. If that flyswatter were brand new, how much would you like to eat the soup?
3. If the soup was first stirred with a thoroughly washed but used comb, how much would you like to eat it?
4. If the soup was served in a thoroughly washed, used dog bowl, how much would you like to eat it?

Now fantasize about your favorite cookie, again one that would rate a 9.

5. How much would you like to eat this cookie if you'd dropped it on the grass first?
6. How much would you like to eat it if a waiter had taken a bite first? an acquaintance? a good friend?

Clearly, the association principle is everything when it comes to food. The idea that something disgusting has been near a favorite dish puts most people

off, even when the food is germ-free. Here are Rozin's results.

1. Eighty-two percent of Rozin's participants rated the "clean-flyswatter soup" a 4 or less; they would dislike eating it.
2. Fifty-eight percent disliked this bowl of soup. Since the flyswatter is brand new, it has less of an association with insects. However, the idea that the soup had been stirred by an object that might *meet a fly in the future* was enough to make some people pass it up.
3. Seventy-six percent disliked this soup. Presumably, the thought of human hair is slightly less disgusting than insect contamination.
4. Seventy-one percent disliked soup served in a dog bowl.
5. Only 34 percent would want to pass up this cookie. There's no assurance of perfect cleanliness, but grass itself has few negative associations for most of us.
6. Eighty-four percent would reject this cookie after a waiter had taken a bite. Only 31 percent would refuse it after an acquaintance had taken a bite, and just 16 percent, if a friend had taken a bite.

This topic can lead naturally to a consideration of John Garcia's taste-aversion studies. You might note that his results have been found to apply to humans as well. Psychologist Martin Seligman coined the term "Sauce-Bearnaise Syndrome" to describe our general tendency to learn some associations much more readily than others. Many hours after eating filet mignon with his favorite sauce, Seligman became violently ill. Although a large number of other novel stimuli occurred in the time interval, and although Seligman later discovered that his symptoms were the result of the stomach flu, he has never again been able to eat sauce bearnaise. The week of Seligman's illness, the first of Garcia's reports was published.

Roach, M. (1989, November/December). Accounting for taste. *Hippocrates*, 49–54.

Rozin, P., Millman, L., & Nemeroff, C. (1986). Operation of the laws of sympathetic magic in disgust and other domains. *Journal of Personality and Social Psychology*, 50, 703–712.

Seligman, M. E., & Hager, J. L. (1972). Biological boundaries of learning. The sauce-bearnaise syndrome. *Psychology Today*, 6, 59–61, 84–87.

*Classroom Exercise/Lecture Break: Explaining Taste Aversions*

Although much of the discussion of learning clearly focuses on the behaviorist perspective, you can take this opportunity to reinforce (pun fully intended here!) what your students have learned about the other theoretical perspectives in psychology. Ask your students



to imagine how a cognitive psychologist, a biologically oriented psychologist, and an evolutionary psychologist might differently explain the phenomenon of taste aversion. You can have them role-play a debate between these psychologists. Or, have them design a hypothetical experiment to pit two different theoretical perspectives against each other in predicting the behavior of a learner in a taste-aversion scenario. Alternatively, you could ask them to evaluate the adequacy of the different theoretical perspectives in explaining

- instinctual drift (the tendency for a learner's behavior to revert back to instinctual behaviors and away from conditioned responses)
- placebo effects (Wikipedia has a well-written page about the concept of "placebo." It includes a brief review of the literature on placebo effects and a short paragraph on the "nocebo effect" (when expectations lead to a worsening of symptoms in a placebo condition); see <http://en.wikipedia.org/wiki/Placebo>).
- second language learning (Why is it easier to learn a second, third, or fourth language in childhood than in adulthood?)

Have your students generate a list of other phenomena they'd like to try to explain!

#### *PsychSim 5: Maze Learning*

A rat is in a maze trying to reach a piece of cheese. The student is supposed to use cognitive maps to try to get the rat to the cheese. Students will have a wonderful time with this one.

#### *Lecture/Discussion Topic: Cognitive Processes in Learning*

To emphasize the importance of cognitive factors in learning, you might review Michael Dawson's studies of conditioning in humans. His results nicely parallel those obtained by Robert Rescorla and Allan Wagner, whose conditioning of animals is well known.

Dawson and his colleagues found that conditioning occurs only when people understand the critical relationship between the unconditioned and conditioned stimuli. Research participants hooked up to an instrument that measures sweat-gland activity are told that shocks may be given sometime during the presentation of five tones. The participant does not know that the shocks are given according to a set plan, for example, after the lowest tone. Dawson reports that those who do not figure out the pattern show no signs of anxiety in anticipation of the shock. He then informs them that the pattern may be predictable; most people figure it out and begin showing signs of stress when they expect a shock. In short, people become conditioned only after

they understand the relationship between the shock and the tones.

Dawson and his colleagues also have experimental evidence that an "accepting" attitude promotes the conditioning process. In one study, they told half the participants that being conditioned was wise, sensible, and intelligent; the other half were told the reverse. Those given positive instructions demonstrated stronger conditioning. Although positive awareness assisted conditioning, negative instructions produced active resistance and undermined the process.

Dawson maintains that his research has implications for therapy: "Take a child who is phobic about dogs, say, and is repeatedly given ice cream or another pleasant stimulus to associate with the object that arouses irrational fear. If the hypothesis I'm testing is correct, behavioral therapists should enlist the child's active cooperation. The therapist should encourage the child to concentrate on the new association of dog/ice cream rather than passively submit to it."

Carpenter, E. (1985, May). Conditioning: It's the thought that counts. *Psychology Today*, 8–10.

#### *Lecture/Discussion Topic: The Overjustification Effect*

The cognitive perspective has shown how excessive rewards can undermine intrinsic motivation, which can then inhibit learning. In class, you may want to explain the "overjustification effect." This refers to the impact of promising a reward for doing what one already likes to do. The person comes to see the reward, rather than intrinsic interest, as the motivation for performing the task.

Many people find the overjustification effect counterintuitive, and, as such, it shows that psychological research often goes beyond common sense. To reinforce this theme, you may want to use an exercise suggested by Harry Hom. Assuming that students have not yet read the relevant research, introduce the exercise with a short discussion on whether preschool children enjoy drawing and receiving recognition in the form of "good player" badges and honor-roll boards. Then, have the class imagine that they are conducting an experiment at a local preschool center. Ask them to pay close attention to the following synopsis of research by M. R. Lepper and colleagues, so they will be able to make predictions before learning the research outcome.

Only preschoolers showing high interest in drawing during free playtime were selected for the research. The children were tested individually and assigned randomly to one of three conditions. In the expected reward condition, children were shown a good player badge and told that if they did a good job of drawing, they could earn a badge and have their names put on the school honor-roll board. All children in this condition received the expect-

ed rewards. In the unexpected reward condition, children were asked to draw without any mention of the awards. Unexpectedly, at the end of the drawing period, all of these children were given the awards. Finally, in the control condition, children were asked simply to draw without promise or presentation of the awards. After this task, children were observed back in the classroom during free playtime, and the amount of time they spent drawing was recorded.

After highlighting the various conditions, have students list the similarities and differences among the three conditions for reward expected and reward received. Then have them predict how much time they think the children from each condition would spend drawing during the later freeplay period. Draw bar graphs of their time predictions on the chalkboard. Their predictions will be quite different from the actual results. The correct prediction is that children from the expected-reward condition later draw less than children from either the control or the unexpected-reward condition, with no significant differences between the latter two conditions. Explain how an already justifiable activity can become overjustified by the promise of added reward. Interest can survive, however, when rewards are used not to bribe or to control, but to communicate a job well done.

Philip Zimbardo relates the amusing story of Nunzi, a shoemaker and an Italian immigrant. Every day after school a gang of young American boys came to his shop to taunt and to tease. After attempting in a variety of ways to get the boys to stop, Nunzi hit upon the following solution.

When the boys arrived the next day after school, he was in front of his store waving a fistful of dollar bills. "Don't ask me why," said Nunzi, "but I'll give each of you a new dollar bill if you will shout at the top of your lungs 10 times: 'Nunzi is a dirty Italian swine.'" Taking the money, the boys shouted the chants in unison. The next afternoon Nunzi successfully enticed the gang to repeat their taunts for a half dollar. On the third day, he had only a handful of dimes: "Business has not been good and I can only give you each 10 cents to repeat your marvelous performance of yesterday."

"You must be crazy," said the ringleader, "to think we would knock ourselves out screaming and cursing for a lousy dime."

"Yah," said another. "We got better things to do with our time than to do favors for only a dime." And away the boys went, never to bother Nunzi again.

Do rewards sometimes undermine motivation in adults? Many studies now show this to be so. In one experiment, adults who were paid to lose weight at first lost pounds faster than those who were not paid. When payments stopped, the paid participants regained some of the lost weight, while those who had not been

paid continued to lose. Similarly, rewards can cast a pall over romantic love. Dating couples were asked to think of either the extrinsic rewards (for example, "she or he knows a lot of people") or the intrinsic rewards (for example, "we always have a good time together") they obtained from going out with their partners. When later asked to state their feelings, the couples who had thought about the extrinsic rewards evaluated themselves as being less in love than did those who had thought about the intrinsic rewards.

The simplest interpretation of these findings is that rewards lead people to think that an activity does not deserve doing in its own right. Why else would someone offer rewards? People therefore come to see the activity as a means rather than an end, and their actions come under the control of the extrinsic reward. When rewards are withdrawn, people judge the activity as no longer worth doing.

Edward Deci has argued that rewards do not inevitably undermine intrinsic motivation. He suggests that rewards—money, praise, gold stars, or candy bars—can be used in two ways: to control us or to inform us on how well we are doing in meeting the challenge of a particular task. When rewards are used to control or manipulate, they are likely to undermine intrinsic motivation. When they are used to inform, they may actually boost people's feelings of competence and intrinsic motivation.

Deci reports research findings in which teachers' use of rewards had either a positive or negative impact on intrinsic motivation. Teachers who valued order and control in the classroom tended to use rewards as sanctions. Those who favored autonomy, encouraging the children to take responsibility for their actions, tended to use rewards informationally. The former undermined intrinsic motivation, while the latter actually fostered it. In the Nunzi story, as well as in the other research examples, the recipients of the rewards probably viewed them as attempts to control rather than inform.

How rewards are presented often determines whether children will see them as controlling or informative. In one study, children were offered prizes for playing with a drum. For one group the prize was in plain view. For the other group the prize was hidden, and the leaders made no further mention of it during the children's performance. Only the children with the reward in plain view showed a significant decrease in intrinsic motivation. Evidently, a clearly presented reward siphons attention away from enjoyment of the immediate task.

In a careful review of the literature, Robert Eisenberger and Linda Shanock also report that rewards for novel performance increase intrinsic motivation and creativity, whereas rewards for conventional performance decrease intrinsic motivation and creativity.

Anticipated rewards thus seem to have more serious (and negative) consequences than unanticipated rewards. People are more likely to see the latter as giving them information about their performance, since the reward was not presented at the beginning as a bribe. Rather than emphasizing rewards from the outset to control a class or a child, perhaps teachers and parents might better use them occasionally as an unexpected bonus.

Expanding this idea to the cultivation of people's enjoyment of initially unappealing tasks such as piano lessons, science homework, or making a first sales call, David Myers suggests first using an intrinsic reward to coax the desired behavior. For example, after the person makes the first sales call, we might say: "I'm not surprised that sales call went well, because you are so good at making a first impression." Furthermore, Myers argues, if we provide learners with enough justification to perform a task and use rewards and labels to help them feel competent, we may enhance their satisfaction and eagerness to pursue the task on their own.

Deci, E. L. (1980). *The psychology of self-determination*. Lexington, MA: D. C. Heath.

Deci, E. L., & Ryan R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Eisenberger, R., & Shanock, L. (2003). Rewards, intrinsic motivation, and creativity: A case study of conceptual and methodological isolation. *Creativity Research Journal*, 15, 121–130.

Hom, H. (1994). Can you predict the overjustification effect? *Teaching of Psychology*, 21, 36–37.

Lepper, M. R., & Greene, D. (Eds.). (1979). *The hidden costs of rewards*. Hillsdale, NJ: Lawrence Erlbaum.

Myers, D. G. (2008). *Social psychology* (9th ed). New York: McGraw-Hill.

*Classroom Exercise: The Work Preference Inventory*  
Handout 9, the Work Preference Inventory, created by Teresa M. Amabile and her colleagues, was designed as a direct, explicit assessment of individual differences in the degree to which students perceive themselves to be intrinsically and extrinsically motivated toward what they do. To assess their intrinsic motivation, students should reverse their scores (1 = 4, 2 = 3, 3 = 2, 4 = 1) for items 9 and 14 and then add the numbers in response to items 3, 5, 7, 8, 9, 11, 13, 14, 17, 20, 23, 26, 27, 28, and 30. To assess their extrinsic motivation students should reverse their scores (1 = 4, 2 = 3, 3 = 2, 4 = 1) for items 1, 16, and 22 and then add the numbers in response to items 1, 2, 4, 6, 10, 12, 15, 16, 18, 19, 21, 22, 24, 25, and 29. Scores on each subscale can range from 15 to 60, with higher scores reflecting great-

er intrinsic and greater extrinsic motivation, respectively. Mean scores for both male and female students are approximately 45 and 39 on the intrinsic and extrinsic scales, respectively. Research suggests little correlation between scores on the two scales.

If you wish, scores on each subscale can be further broken down. Items 3, 5, 9, 11, 13, 14, and 26 reflect an orientation toward challenging tasks, and items 7, 8, 17, 20, 23, 27, 28, and 30 show an orientation toward enjoyment in one's work. Items 1, 2, 6, 12, 15, 18, 21, 24, 25, and 29 reflect an outward orientation toward the recognition and dictates of others, while items 4, 10, 16, 19, and 22 reflect concern with compensation.

Amabile and her colleagues also looked at the relationship between intrinsic and extrinsic motivation and other measures of personality, attitudes, and perceptions. Among the interesting findings are that intrinsic motivation correlates positively with the need for cognition, academic comfort (feeling comfortable doing academic activities), interest in scientific pursuits, creativity, adult playfulness, and cognitive curiosity. Extrinsic motivation was negatively related to the need for cognition, and extrinsically oriented individuals tended to be ESTJ types (Extraverted, Sensing, Thinking, and Judging) as measured on the Myers-Briggs Type Inventory. In other research ESTJ types have been found to prefer business marketing and management careers, emphasize economic values, and describe themselves as conscientious with a preference for order.

Amabile, T. M., Hill, K. G., Hennessey, B. A., & Tighe, E. M. (1994). The work preference inventory: Assessing intrinsic and extrinsic motivational orientations. *Journal of Personality and Social Psychology*, 66, 950–967.

#### *Lecture/Discussion Topic: Mindful Learning*

Ellen Langer's distinction between mindful and mindless learning highlights the importance of cognitive processes in education.

Langer argues that learning requires mindful engagement with the material in question. Mindfulness, she writes, is a "flexible state of mind in which we are actively engaged in the present, noticing new things, and sensitive to context." Being mindful involves drawing novel distinctions and thereby avoiding mind sets that limit us. When we are in a state of mindlessness, "we act like automatons who have been programmed to act according to the sense our behavior made in the past, rather than the present." Past research findings, notes Langer, suggest that mindfulness leads to increased competence, fewer accidents, and improved memory, creativity, and positive affect. (See Handout 2 in the Consciousness and the Two-Track Mind unit, p. 163, for Brown and Ryan's Mindful Attention Awareness Scale and a discussion of related research.)

Mindlessness, Langer argues, comes about through both repetition and single exposure. For example, if we repeat some task many times, we may come to establish a mind-set for performing it. We may drive a familiar route so often that finally the car seems to arrive at the destination by itself. Similarly, if we process information without questioning it, that is, without considering the alternative ways it could be understood, we take it in mindlessly. It will not occur to us to reconsider it. Our commitment to “one” understanding may later be to our disadvantage. Langer identifies three myths or mind-sets that detract from our ability to learn.

Myth 1 is that “the basics should be learned so well that they become second nature.” The problem is that if we learn the basics so well it will not occur to us to change them when we need to. In one study, Langer and her colleagues taught research participants a new sport, “smack-it ball,” in which the players wear a glovelike racket. Some were taught “this is how you play the game”; others were told, “here is how it *could* be played.” After all were well practiced, the researchers substituted a much heavier ball. Those who learned the game mindfully were better able to accommodate than those who took the basics for granted.

Myth 2 is that “to pay attention to something, we should hold it still and focus on it.” Attending to a still image is difficult; it fades from view. However, attending to an image mindfully, noticing different things about it, is easy. In several studies, Langer’s research team asked participants to pay attention to a stimulus or to notice new things about it. Whether the participants were elderly or children with attention problems, instructions to vary the target of attention improved performance. Not only is the task easier, but people remember more about the target of their attention and like it better.

Myth 3 is that “it is important to learn how to delay gratification.” The problem with this idea is that it suggests tasks are inherently good or bad. Evaluation resides in our minds, not in the tasks. Work and study are not negative. However, we often make them appear to be so. Langer and Sofia Snow asked a group of people to evaluate the humor in cartoons, in some cases calling the task “work” and in other cases “play.” When they called it work, people tended to enjoy it less and their minds were more likely to wander. In other studies, people engaged in activities they did not like (viewing art, watching football). Some were led to engage the task the way they typically did, while others were asked to notice new things about it. The more the people noticed, the more they liked the task. Mindful learning engages people and the experience tends to be positive.

Langer, E. (2000). Mindful learning. *Current Directions in Psychological Science*, 9, 220–223.

## Learning by Observation

### Bandura’s Experiments

#### *PsychSim 5: Monkey See, Monkey Do*

This activity introduces Bandura’s classic research on observational learning. It shows some video clips of two children who participated in the experiment and allows students to practice their skills in observing and labeling specific behaviors performed by these children.

### Applications of Observational Learning

#### *Student Project: Acquiring a Skill Through Observation*

Bem Allen offers practical advice for mastering valuable everyday skills: Be highly conscious and thoughtful in observing a model who possesses some ability you lack. In addition to finding a model who will allow you to watch, you would benefit from obtaining the active cooperation and support of the model.

Allen illustrates how you might use this advice in learning to speak well in public. The model might be a member of student government or an officer in your fraternity or sorority. Personally knowing the model will likely help in gaining his or her cooperation. Begin by identifying your own problem areas—for example, beginning a speech, typically a critical and often frightening part of public speaking. Observe how your model begins a speech. He or she may “tell a funny story,” or talk “off-the-cuff,” without notes, about reasons that the topic is important. When you have seen enough to feel ready to try it on your own, begin a speech in a nonthreatening setting with your model in attendance for later consultation. Repeat this process for ending a speech, keeping an audience interested, and other aspects of speech making that you find important and difficult. By repeating this cycle of asking pertinent questions of your model, having him or her demonstrate the answer, and then practicing in the presence of the model, you gradually gain confidence with regard to your own performance. Eventually, you will be able to perform regularly and effectively on your own.

Finally, Allen suggests some everyday skills that lend themselves well to mastery through this kind of observational learning: Gaining the confidence of a child, asking a person for a date, selling a product, keeping an argument civil, breaking off a conversation, asking a favor of a friend, and starting a conversation with a stranger.

Allen, B. (2003). *Personality theories: Development, growth, and diversity* (4th ed.). Boston: Allyn & Bacon.

#### *Lecture/Discussion Topic: Germans Who Helped Jews Escape*

The Social Psychology unit in these resources includes the results of Perry London’s study of European



Christians who helped Jews flee Nazi Germany. London found, among other things, that those who risked their lives to rescue Jews from the Nazis tended to have had a close relationship with at least one parent who modeled a strong moral or humanitarian concern. The study could provide a good introduction to the significance of observational learning.

*Lecture/Discussion Topic: Observational Learning*

Robert Cialdini's discussion of "Social Proof: Truths Are Us" provides a rich resource for a lecture on or discussion of observational learning. For example, Albert Bandura has shown how modeling can eliminate undesirable behaviors. In one study, nursery school children, chosen because they were terrified of dogs, merely watched a little boy playing happily with a dog for 20 minutes. As a result of this experience, 67 percent were willing to climb into a playpen with a dog and remain confined there petting and scratching the dog while everyone else left the room. Their observations seemed to have a lasting positive effect. One month later, the children were more willing than ever to approach dogs. Subsequent research has indicated that filmed models have the same effect. The greatest reduction in fear occurred when the film clips depicted a variety of other children interacting with their dogs. Observational learning may be strongest when we perceive many performing the same action.

Filmed models have been used in therapy for diverse problems. Socially withdrawn children watched a variety of scenes in which a clearly shy child is treated positively when he interacts in a social activity. The impact was obvious. After watching the film, the shy children began to interact with their peers at a level equal to that of other children in the school.

Cialdini suggests that our tendency to imitate the behavior of others is exploited in a variety of settings. For example, television executives seem to know what they are doing when they use canned laughter. Experiments indicate that the technique causes an audience to laugh louder and more often when humorous material is presented. Advertisers love to tell us that their product is the "fastest growing" or "largest selling." The fact that many others are using it prompts us to buy it. Bartenders salt their tip jars with a few dollar bills to demonstrate appropriate customer behavior. The producers of charity telethons devote a great deal of time to listing the viewers who have already pledged contributions on the premise that others will follow suit.

Research indicates that imitative behavior is more likely to occur in ambiguous situations. For example, bystanders' decisions to help are much more influenced by the actions of other bystanders when the situation is unclear. We are also more likely to imitate the behavior of those who are similar to ourselves. The effects of

similarity may be seen in the suicide statistics compiled by sociologist David Phillips. His studies indicate that highly publicized suicides tend to prompt other troubled individuals who are similar to the suicide-story victim to kill themselves. Cialdini sees the factors of uncertainty and similarity coming together to induce the herdlike suicide of the members of People's Temple cult at Jonestown, Guyana, in November 1978. His analysis also helps us to understand the 39 suicides of the Heaven's Gate cult in spring 1997.

Cialdini, R. (2009). *Influence: Science and practice* (5th ed.). Needham Heights, MA: Allyn & Bacon.

*Lecture/Discussion Topic: Media Violence and Aggression*

How strong is the link between media violence and aggression? Brad Bushman and Craig Anderson argue that 50 years of news coverage on this relationship have left the general public confused. In that time, the average news report has changed from claims of a weak link between media violence and aggression to reports of a moderate link and now back again to claims of a weak link. On the other hand, the researchers report, since 1975, the scientific confidence and statistical magnitude of this relationship have been clearly positive and have consistently increased over time. Why this disparity? Bushman and Anderson point to the vested interest of the news, a misapplied fairness doctrine in news reporting (giving equal weight to the entertainment industry's disclaimers of any relationship and scientific investigators' evidence for the relationship, and the failure of the scientific community to effectively argue the scientific case).

What does scientific research indicate regarding the strength of the relationship between media violence and aggression? Is it weak, as the news reports suggest? Bushman and Anderson report a careful comparison with 10 other researched links. The link between media violence and aggression showed the second largest correlation, a bit weaker than the correlation that research has found between smoking and lung cancer but stronger than that between condom use and sexually transmitted HIV, passive smoking and lung cancer at work, exposure to lead and IQ scores in children, the use of the nicotine patch and smoking cessation, calcium intake and bone mass, homework and academic achievement, exposure to asbestos and laryngeal cancer, and self-examination and the extent of breast cancer.

Bushman and Anderson draw several instructive parallels between the smoking and lung cancer relationship (which most acknowledge to be strong) and the media violence and aggression connection. First, not everyone who smokes gets lung cancer, and not everyone who gets lung cancer smokes. Likewise, not everyone who watches media violence becomes aggressive, and not every aggressor watches violent media. Second,

smoking is not the only factor that causes lung cancer, but it is an important one. Viewing violent media is not the only factor that causes aggression but it is an important one. Third, the first cigarette may produce nausea. Repeated exposure reduces this effect, and the smoker begins to crave more cigarettes. The first exposure to media violence can make a person (especially a child) anxious and fearful. Repeated exposure reduces these effects and leaves the viewer wanting stronger doses of violence. Fourth, the short-term effects of smoking are rather innocuous in most cases and dissipate quite rapidly. For example, smoking a single cigarette has physiological effects that are not serious and are gone within an hour or so. Similarly, watching one violent film increases aggressive thoughts, feeling, and actions, but these effects do not last for more than an hour. Fifth, the cumulative effects of smoking are severe. Smoking a pack a day for 15 years significantly increases the chances of contracting lung cancer. Similarly, the research indicates that watching violent TV a couple of hours a day for 15 years causes a significant increase in the likelihood of a person becoming habitually aggressive and occasionally a violent offender. Finally, in the long struggle between the medical community and the tobacco industry, the big money interests of the latter led them to deny publicly any claim that smoking produced lung cancer. The entertainment industry continues to deny the link between its portrayal of violence and viewer aggression. Just as in 1964, the U.S. Surgeon General concluded that the evidence on the harmful effects of smoking was so overwhelming that he needed to issue a warning, in 1972, the U.S. Surgeon General concluded that the evidence on media violence effects was so overwhelming that he needed to issue a warning.

In the time since the initial large review was conducted, the U.S. Centers for Disease Control has sponsored ongoing research on this topic, this time focusing on the impact of media violence in the field (rather than in laboratory environments). The CDC projects are aimed at controlling for variables that may influence aggressive behavior—for example, exposure to violent or aggressive behavior at home or at school, emotional problems in individuals or their families, and academic difficulties. In one study, Paul Boxer and colleagues interviewed a large pool of adolescents, their parents or guardians, and their teachers. They were first asked to name their favorite TV programs, movies, video/computer games, then to identify their antisocial behaviors. Exposure to media violence was predictive of violent or aggressive behavior in the adolescents. The authors of the study indicated, “even for those lowest in other risk factors, a preference for violent media was predictive of violent behavior and general aggression.”

Boxer, P., Huesmann, L. R., Bushman, B. J., O’Brien, M., & Mocerri, D. (2009, February). The role of violent media preference in cumulative developmental risk for violence and general aggression. *Journal of Youth and Adolescence*, 38, 417–428. online early DOI: 10.1007/s10964-008-9335-2.

Bushman, B. J., & Anderson, C. A. (2001). Media violence and the American public: Scientific facts versus media misinformation. *American Psychologist*, 56, 477–489.

Rutgers University (2008, November 20). Media violence cited as ‘critical risk factor’ for aggression. *ScienceDaily*. Retrieved June 9, 2011, from [www.sciencedaily.com/releases/2008/11/081119122632.htm](http://www.sciencedaily.com/releases/2008/11/081119122632.htm).

#### *Lecture/Discussion Topic: Parents and Television Watching*

In a review of the research literature, Craig Anderson and colleagues highlight the important role of parental monitoring and guidance in reducing the harmful effects of media violence. They conclude that the impact of media violence can be reduced “if parents guide their children’s media exposure and discuss their interpretation of media violence with their children.” Research suggests that when parents speak negatively about violent TV or restrict viewing of violent television content, children show less aggressive attitudes. On the other hand, if parents watch TV with their children and say nothing about the violent content, children demonstrate stronger aggressive attitudes.

This analysis clearly reaffirms the importance of the following guidelines for parents that an American Psychological Association task force on television issued in 1992:

- Maintain an activities time chart, including TV viewing, playing with friends, and homework. Discuss what to eliminate as well as its substitute.
- Establish a weekly viewing limit. Have children select programs from television schedules at the beginning of the week. Assign points to specific programs and set a point total for the week. Less desirable programs may cost more to watch.
- Rule out TV at certain times, say, at mealtimes or on school nights.
- Encourage the entire family to make a program choice before turning on the TV.
- Remember that you provide a model. If you watch a lot of TV, chances are that your children will, too.

In monitoring the violence children see, the task force suggests that caregivers:

- watch at least one episode of the programs their children watch to know the frequency and degree of violence.

- when viewing violence with children, discuss why it occurs and how painful it is. Ask how conflict might be resolved without aggression.
- explain how violence on programs is faked.
- encourage children to view programs with characters who cooperate and care for one another.

Anderson, C. A., et al. (2003). The influence of media violence on youth. *Psychological Science in the Public Interest*, 4, 81–110.

APA Task Force on Television and Society. (1992). *Violence on television*. Washington, DC: American Psychological Association.

## HANDOUT 1

### Examples of Learning

1. The cessation of thumb sucking by an infant.
2. The acquisition of language in children.
3. A computer program generates random opening moves for its first 100 chess games and tabulates the outcomes of those games. Starting with the 101st game, the computer uses those tabulations to influence its choice of opening moves.
4. A worm is placed in a T maze. The left arm of the maze is brightly lit and dry; the right arm is dim and moist. On the first 10 trials, the worm turns right 7 times. On the next 10 trials, the worm turns right all 10 times.
5. Ethel stays up late the night before the October GRE administration and consumes large quantities of licit and illicit pharmacological agents. Her combined (verbal plus quantitative) score is 410. The night before the December GRE administration, she goes to bed early after a wholesome dinner and a glass of milk. Her score increases to 1210. Is the change in scores due to learning? Is the change in pretest regimen due to learning?
6. A previously psychotic patient is given Dr. K's patented phrenological surgery and no longer exhibits any psychotic behaviors.
7. A lanky zinnia plant is pinched back and begins to grow denser foliage and flowers.
8. MYCIN is a computer program that does a rather good job of diagnosing human infections by consulting a large database of rules it has been given. If we add another rule to the database, has MYCIN learned something?
9. After pondering over a difficult puzzle for hours, Jane finally figures it out. From that point on, she can solve all similar puzzles in the time it takes her to read them.
10. After 30 years of smoking two packs a day, Zeb throws away his cigarettes and never smokes again.

Source: Reprinted by permission of Lawrence Erlbaum Associates, Inc. and the author from Rocklin, T. (1987). Defining learning: Two classroom activities. *Teaching of Psychology*, 14, 228.



## HANDOUT 2

### Examples of Conditioning

Human behaviors change over time. They change in different ways (becoming stronger or weaker, or more or less frequent) and for different reasons. Think about patterns of behavior that have changed over time in your own personal history and try to figure out what produced the changes. Consider both (a) behaviors that were automatically elicited from you by stimuli or events occurring in your environment, and (b) behaviors that you had more willful control over. Use the following questions to analyze the behaviors in more detail.

1. Reflexive, Automatic Behaviors:
  - a. Name a behavior that is automatically produced as a response to a stimulus or set of stimuli in your environment (e.g., a sight, a sound, or some other occurrence).
  - b. What stimulus or set of stimuli automatically causes you to produce this behavior?
  - c. Give an example of conditions that strengthen this reflexive behavior or cause it to occur more often.
  - d. Give an example of conditions that weaken this reflexive behavior or cause it to occur less often.
  
2. Voluntary Behaviors:
  - a. Name a specific behavior that you produce to gain something (that you like) as an outcome of that behavior.
  - b. Give an example of conditions that strengthen this voluntary behavior or cause it to occur more often.
  - c. Name a specific behavior that you produce to avoid something (that you don't like) as an outcome of that behavior.
  - d. Give an example of conditions that strengthen this voluntary behavior or cause it to occur more often.
  - e. Name a specific behavior that earns you something that you do not like as an outcome of that behavior.
  - f. Give an example of conditions that weaken this voluntary behavior or cause it to occur less often.
  - g. Name a specific behavior that you produce to avoid losing something that you do like as an outcome of that behavior.
  - h. Give an example of conditions that weaken this voluntary behavior or cause it to occur less often.

## HANDOUT 3

**Conditioning the Eyeblink Response**

This exercise involves the conditioning of the human eyeblink. It's best if you work with one other co-experimenter who does the recording. In addition, you will need one willing participant, a spoon, a straw, and two tall, thin glasses. Fill one glass with water, leave the other empty.

1. Have the person sit at a table with his chin resting in his hands so his head remains stationary.
2. Begin by tapping the *full* glass once (CS) with the spoon. Note the participant's reactions. Tap a few more times until he makes no consistent response.
3. Begin conditioning by tapping the glass once, followed immediately by a strong puff of air to the person's eye (US) through the straw. Be certain the air is strong enough to elicit an eyeblink (UR). Repeat the procedure seven times at 20-second intervals.
4. On the eighth trial (the test trial) tap the glass but deliver no puff of air. Record whether an eyeblink (CR) occurs in response to the sound.
5. Repeat seven more conditioning trials and then another test trial, also at 20-second intervals. Record any blinking responses. Continue alternating seven conditioning trials with one test trial until the sound clearly elicits an eyeblink.
6. To assess whether generalization has occurred, tap the *empty* glass with the spoon. Record whether a clear blink is made. If the generalization is obvious, proceed with discrimination training. Otherwise go to step 8.
7. Tap each of the glasses in random fashion and present the puff of air only after tapping the full glass. Record the number of trials until the person stops blinking in response to your tapping the empty glass.
8. Proceed with extinction. Tap the full glass approximately every 20 seconds until no eyeblink is elicited. Record the number of trials needed to achieve extinction.
9. After allowing the participant to relax for 4 minutes, test for spontaneous recovery. Tap the glass but deliver no puff of air. Record the number of trials needed to achieve extinction again.

Source: Adapted by permission of Prentice Hall, Upper Saddle River, NJ, from Gardner, R. M. (1980). *Exercises for general psychology* (pp. 69–72). Copyright 1980.

## HANDOUT 4

**Negative Reinforcement Quiz**

1. If you were asked for another word or phrase for negative reinforcement, what would you select?  
  
\_\_\_\_\_
2. When you supply negative reinforcement, it usually results in:  
  
\_\_\_\_ a. Weakening a behavior that you want weakened.  
  
\_\_\_\_ b. Strengthening a behavior that you want strengthened.
3. Do people usually look forward to receiving negative reinforcement?  
  
\_\_\_\_ a. Yes      \_\_\_\_ b. No
4. Do you anticipate regularly (consciously) supplying positive reinforcement to those you might manage in the future?  
  
\_\_\_\_ a. Yes      \_\_\_\_ b. No
5. Do you anticipate regularly (consciously) supplying negative reinforcement to those you might manage in the future?  
  
\_\_\_\_ a. Yes      \_\_\_\_ b. No

Source: Tauber, R. (1990). Teaching the distinction between negative reinforcement and punishment. In V. P. Makovsky et al. (Eds.), *Activities handbook for the teaching of psychology*, Vol. 3, p. 100. Copyright 1990 by the American Psychological Association. Reprinted with permission.

## HANDOUT 5

### Forms of Reinforcement and Punishment

	<b>Reinforcement: Behavior increases or strengthens over time</b>	<b>Punishment: Behavior decreases or weakens over time</b>
Positive: Results in receiving something	(Reinforcer is something given and desired)	(Punisher is something given and aversive)
Negative: Results in having something taken away, removed	(Reinforcer is something taken away and aversive)	(Punisher is something taken away and desired)



## HANDOUT 6

**Reinforcement Schedules**

In real life, continuous reinforcement is rare. Sometimes responses are reinforced, sometimes not. Among the most important schedules of partial reinforcement are the fixed ratio (FR), variable ratio (VR), fixed interval (FI), and variable interval (VI). Identify the schedule in the examples below by writing your answer—FR, VR, FI, or VI—in the spaces on the left.

- \_\_\_\_\_ 1. A senior citizen buying state lottery tickets and winning.
- \_\_\_\_\_ 2. A hotel maid may take a 15-minute break only after having cleaned three rooms.
- \_\_\_\_\_ 3. A man watches and sees shooting stars on a dark night.
- \_\_\_\_\_ 4. A teenager receives an allowance every Saturday.
- \_\_\_\_\_ 5. A woman checks the front porch for a newspaper when the delivery person is extremely unpredictable.
- \_\_\_\_\_ 6. A professional baseball player gets a hit approximately every third time at bat.
- \_\_\_\_\_ 7. A teenager checks the oven to see if chocolate chip cookies are done, when baking time is known.
- \_\_\_\_\_ 8. A blueberry picker receives \$1 after filling 3 pint boxes.
- \_\_\_\_\_ 9. A charitable organization makes an average of 10 phone calls for every donation it receives.
- \_\_\_\_\_ 10. A busy executive calls a garage mechanic to see if her car is fixed yet.
- \_\_\_\_\_ 11. A student's final grade improves one level for every three book reviews submitted.
- \_\_\_\_\_ 12. A student goes to the cafeteria to see if the next meal is available.

## HANDOUT 7

## Consideration of Future Consequences Scale

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), please write a “1” to the left of the question; if the statement is extremely characteristic of you (very much like you), please write a “5” next to the question. And, of course, use the numbers in the middle if you fall between the extremes. Please keep the following scale in mind as you rate each of the statements below.

1	2	3	4	5
extremely uncharacteristic	somewhat uncharacteristic	uncertain	somewhat characteristic	extremely characteristic

- \_\_\_\_\_ 1. I consider how things might be in the future, and try to influence those things with my day-to-day behavior.
- \_\_\_\_\_ 2. Often I engage in a particular behavior in order to achieve outcomes that may not result for many years.
- \_\_\_\_\_ 3. I only act to satisfy immediate concerns, figuring the future will take care of itself.
- \_\_\_\_\_ 4. My behavior is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.
- \_\_\_\_\_ 5. My convenience is a big factor in the decisions I make or the actions I take.
- \_\_\_\_\_ 6. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.
- \_\_\_\_\_ 7. I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years.
- \_\_\_\_\_ 8. I think it is more important to perform a behavior with important distant consequences than a behavior with less-important immediate consequences.
- \_\_\_\_\_ 9. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.
- \_\_\_\_\_ 10. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.
- \_\_\_\_\_ 11. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.
- \_\_\_\_\_ 12. Since my day-to-day work has specific outcomes, it is more important to me than behavior that has distant outcomes.

Source: Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66, 752.  
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## HANDOUT 8

**Sensitivity to Punishment and Sensitivity to Reward Questionnaire**

Answer each question by circling “YES” or “NO” after each one. There are no right or wrong answers, or trick questions. Work quickly and don’t think too much about the exact meaning of the question.

**REMEMBER TO ANSWER ALL THE QUESTIONS**

- |  |     |    |
|--|-----|----|
| 1. Do you often refrain from doing something because you are afraid of it being illegal?   | YES | NO |
| 2. Does the good prospect of obtaining money motivate you strongly to do some things?  | YES | NO |
| 3. Do you prefer not to ask for something when you are not sure you will obtain it?  | YES | NO |
| 4. Are you frequently encouraged to act by the possibility of being valued in your work, in your studies, with your friends or with your family? | YES | NO |
| 5. Are you often afraid of new or unexpected situations?   | YES | NO |
| 6. Do you often meet people that you find physically attractive?   | YES | NO |
| 7. Is it difficult for you to telephone someone you do not know?   | YES | NO |
| 8. Do you like to take some drugs because of the pleasure you get from them?   | YES | NO |
| 9. Do you often renounce your rights when you know you can avoid a quarrel with a person or an organization?                                     | YES | NO |
| 10. Do you often do things to be praised?  | YES | NO |
| 11. As a child were you troubled by punishments at home or in school?  | YES | NO |
| 12. Do you like being the center of attention at a party or a social meeting?  | YES | NO |
| 13. In tasks that you are not prepared for, do you attach great importance to the possibility of failure?  | YES | NO |
| 14. Do you spend a lot of your time on obtaining a good image?   | YES | NO |
| 15. Are you easily discouraged in difficult situations?  | YES | NO |
| 16. Do you need people to show their affection for you all the time?   | YES | NO |
| 17. Are you a shy person?  | YES | NO |
| 18. When you are in a group, do you try to make your opinions the most intelligent or the funniest?  | YES | NO |
| 19. Whenever possible, do you avoid demonstrating your skills for fear of being embarrassed?   | YES | NO |
| 20. Do you often take the opportunity to pick up people you find attractive?   | YES | NO |
| 21. When you are with a group, do you have difficulties selecting a good topic to talk about?  | YES | NO |
| 22. As a child, did you do a lot of things to get people’s approval?   | YES | NO |
| 23. Is it often difficult for you to fall asleep when you think about things you have done or must do?   | YES | NO |
| 24. Does the possibility of social advancement move you to action, even if this involves not playing fair?                                       | YES | NO |
| 25. Do you think a lot before complaining in a restaurant if your meal is not well prepared?   | YES | NO |
| 26. Do you generally give preference to those activities that imply an immediate gain?   | YES | NO |
| 27. Would you be bothered if you had to return to a store when you noticed you were given the wrong change?                                      | YES | NO |
| 28. Do you often have trouble resisting the temptation of doing forbidden things?  | YES | NO |

HANDOUT 8 (*continued*)

29. Whenever you can, do you avoid going to unknown places?	YES	NO
30. Do you like to compete and do everything you can to win?	YES	NO
31. Are you often worried by things that you said or did?	YES	NO
32. Is it easy for you to associate tastes and smells to very pleasant events?	YES	NO
33. Would it be difficult for you to ask your boss for a raise (salary increase)?	YES	NO
34. Are there a large number of objects or sensations that remind you of pleasant events?	YES	NO
35. Do you generally try to avoid speaking in public?	YES	NO
36. When you start to play with a slot machine, is it often difficult for you to stop?	YES	NO
37. Do you, on a regular basis, think that you could do more things if it was not for your insecurity or fear?	YES	NO
38. Do you sometimes do things for quick gains?	YES	NO
39. Comparing yourself to people you know, are you afraid of many things?	YES	NO
40. Does your attention easily stray from your work in the presence of an attractive stranger?	YES	NO
41. Do you often find yourself worrying about things to the extent that performance in intellectual abilities is impaired?	YES	NO
42. Are you interested in money to the point of being able to do risky jobs?	YES	NO
43. Do you often refrain from doing something you like in order not to be rejected or disapproved by others?	YES	NO
44. Do you like to put competitive ingredients in all of your activities?	YES	NO
45. Generally, do you pay more attention to threats than to pleasant events?	YES	NO
46. Would you like to be a socially powerful person?	YES	NO
47. Do you often refrain from doing something because of your fear of being embarrassed?	YES	NO
48. Do you like displaying your physical abilities even though this may involve danger?	YES	NO

Source: Avila, C. (2001). Distinguishing BIS-mediated and BAS-mediated disinhibition mechanisms: A comparison of disinhibition models of Gray (1981, 1987) and of Patterson and Newman (1993). *Journal of Personality and Social Psychology*, 80, 324. Copyright © 2001 by the American Psychological Association. Reprinted with permission.



## HANDOUT 9

**The Work Preference Inventory**

Respond to each of the items using a scale from 1 = never or almost never true of me to 4 = always or almost always true of me.

- \_\_\_ 1. I am not that concerned about what other people think of me.
- \_\_\_ 2. I prefer having someone set clear goals for me in my work.
- \_\_\_ 3. The more difficult the problem, the more I enjoy trying to solve it.
- \_\_\_ 4. I am keenly aware of the goals I have for getting good grades.
- \_\_\_ 5. I want my work to provide me with opportunities for increasing my knowledge and skills.
- \_\_\_ 6. To me, success means doing better than other people.
- \_\_\_ 7. I prefer to figure things out for myself.
- \_\_\_ 8. No matter what the outcome of a project, I am satisfied if I feel I gained a new experience.
- \_\_\_ 9. I enjoy relatively simple, straightforward tasks.
- \_\_\_ 10. I am keenly aware of the GPA (grade point average) goals I have for myself.
- \_\_\_ 11. Curiosity is the driving force behind much of what I do.
- \_\_\_ 12. I'm less concerned with what work I do than what I get for it.
- \_\_\_ 13. I enjoy tackling problems that are completely new to me.
- \_\_\_ 14. I prefer work I know I can do well over work that stretches my abilities.
- \_\_\_ 15. I'm concerned about how other people are going to react to my ideas.
- \_\_\_ 16. I seldom think about grades and awards.
- \_\_\_ 17. I'm more comfortable when I get to set my own goals.
- \_\_\_ 18. I believe there is no point in doing a good job if nobody else knows about it.
- \_\_\_ 19. I am strongly motivated by the grades I can earn.
- \_\_\_ 20. It is important for me to be able to do what I most enjoy.
- \_\_\_ 21. I prefer working on projects with clearly specified procedures.
- \_\_\_ 22. As long as I can do what I enjoy, I'm not that concerned about exactly what grades or awards I can earn.
- \_\_\_ 23. I enjoy doing work that is so absorbing that I forget about everything else.
- \_\_\_ 24. I am strongly motivated by the recognition I can earn from other people.
- \_\_\_ 25. I have to feel that I'm earning something for what I do.
- \_\_\_ 26. I enjoy trying to solve complex problems.
- \_\_\_ 27. It is important for me to have an outlet for self-expression.
- \_\_\_ 28. I want to find out how good I really can be at my work.
- \_\_\_ 29. I want other people to find out how good I really can be at my work.
- \_\_\_ 30. What matters most to me is enjoying what I do.

Source: Amabile, T. M., Hill, K. G., Hennessey, B. A., & Tighe, E. M. (1994). The work preference inventory: Assessing intrinsic and extrinsic motivational orientations. *Journal of Personality and Social Psychology*, 66, 956, Table 1. Copyright © 1994 by the American Psychological Association. Reprinted with permission.

