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Study Guide 9-1 Classical Conditioning

For use with textbook pages 241–248

Key Terms

classical conditioning a learning procedure in which associations are made between a natural stimulus and a learned, neutral stimulus (page 241)

neutral stimulus a stimulus that does not initially elicit any part of the unconditioned response (page 242)

unconditioned stimulus (UCS) a stimulus that elicits a certain predictable response typically without previous training (page 242)

unconditioned response (UCR) an organism's automatic reaction to a stimulus (page 242)

conditioned stimulus (CS) a once-neutral event that has come to elicit a given response after a period of training in which it has been paired with an unconditioned stimulus (page 242)

conditioned response (CR) the learned reaction to a conditioned stimulus (page 242)

generalization responding similarly to a range of similar stimuli (page 244)

discrimination the ability to respond differently to similar but distinct stimuli (page 244)

extinction the gradual disappearance of a conditioned response when the conditioned stimulus is repeatedly presented without the unconditioned stimulus (page 245)

Drawing From Experience

Have you ever reached for your phone after hearing a ring on the television? Do you have a pet that runs to its food dish the minute you walk in the house? This section discusses how classical conditioning affects human and animal behavior.

Organizing Your Thoughts

Use the diagram below to help you take notes as you read the summaries that follow. Think about how a neutral stimulus becomes a conditioned stimulus.

Before Conditioning	During Conditioning	After Conditioning
1. A neutral stimulus results in ______________.	**3.** A conditioned stimulus is paired with the ______________.	**5.** A conditioned stimulus results in a(n) ______________.
2. An unconditioned stimulus results in a(n) ______________.	**4.** The result is a(n) ______________.	**6.** The conditioning will last unless ______________ occurs.

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Read to Learn

Introduction (page 241)

What is learning? Learning takes place when a person or an animal has an experience that changes his or her behavior, more or less permanently. **Classical conditioning** is a type of learning. When something makes you react in a certain way, it is called a stimulus. During classical conditioning, people and animals learn to respond to a new stimulus the same way that they respond to one they already know.

7. Who was the first person to explain how classical conditioning worked?

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Classical Conditioning (page 242)

A stimulus that you respond to without training is called an **unconditioned stimulus (UCS)**. Your response is called an **unconditioned response (UCR)**. A **neutral stimulus** is one that has nothing to do with your response. Ivan Pavlov gave an unconditioned stimulus and a neutral stimulus to a dog at the same time. He discovered that the dog would eventually learn to respond to the neutral stimulus in the same way as it did to the unconditioned stimulus.

If you watch an action movie, you will feel tense at certain times during the movie when the main characters are in danger. If the movie plays the same song every time the characters are in danger, you will eventually feel tense when you hear the music, even if you are not watching the movie. The song is a neutral stimulus. It did not make you feel tense before you saw the movie. After conditioning, the neutral stimulus (the song) is called a **conditioned stimulus (CS)**. Your response is called a **conditioned response (CR)**.

Classical conditioning works gradually. Sometimes you will respond to a neutral stimulus that is similar to the conditioned stimulus. This is called **generalization**. For example, if you are conditioned to feel tense when you hear a certain song, you might feel tense when you hear other songs with a similar beat. If you did, that would be generalization. Eventually, you will learn to tell the difference between a conditioned stimulus and a similar neutral stimulus. This is called **discrimination**. If you learn to feel tense only when you hear the song from the movie, and not when you hear other songs with a similar beat, you have learned discrimination.

Classical conditioning is not always permanent. If the conditioned stimulus and the unconditioned stimulus are not given together for a long time, the conditioned stimulus stops working. The conditioned response stops. This is called **extinction.** If you were conditioned to feel tense when you heard a song during a movie, but then never watched the movie again, you would eventually stop feeling tense when you heard the song. If the unconditioned stimulus and the conditioned stimulus are again put together, the conditioned response comes back quickly. This is called spontaneous recovery.

8. If you strongly dislike broccoli, green beans, and spinach, what is your reaction likely to be if you are served green peas? Which process of classical conditioning would you be using?

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Classical Conditioning and Human Behavior (page 246)

A person can be conditioned on purpose or by accident. To stop children from wetting the bed, parents can use a device called a bell and pad. The pad is put on the bed and wired to a bell. When the child starts to wet the bed, the pad gets wet causing the bell to ring. The child wakes up and uses the bathroom. The bell is an unconditioned stimulus. A child will always respond to it. By ringing the bell when the child's bladder is full, the child learns to wake up when he or she needs to go to the bathroom. The full bladder becomes a conditioned stimulus.

A taste aversion is an example of accidental classical conditioning. Suppose you eat snails for the first time. Later in the evening, you feel sick. You will probably think the snails made you sick and you will not like the smell or thought of them the next time someone serves them.

9. If you develop a taste aversion, what can you do to overcome it?

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Study Guide 9-2

Operant Conditioning

For use with textbook pages 250–258

Key Terms

operant conditioning a form of learning in which a certain action is reinforced or punished, resulting in corresponding increases or decreases in the likelihood that similar actions will occur again (page 250)

reinforcement a stimulus or event which follows a response and increases the likelihood that the response will be repeated (page 251)

primary reinforcer a stimulus that is naturally rewarding, such as food or water (page 252)

secondary reinforcer a stimulus such as money that becomes reinforcing through its link with a primary reinforcer (page 252)

fixed-ratio schedule a schedule of reinforcement in which a specific number of correct responses is required before reinforcement can be obtained (page 253)

variable-ratio schedule a schedule of reinforcement in which an unpredictable number of responses are required before reinforcement can be obtained each time (page 254)

fixed-interval schedule a schedule of reinforcement in which a specific amount of time must elapse before a response will elicit reinforcement (page 254)

variable-interval schedule a schedule of reinforcement in which changing amounts of time must elapse before a response will obtain reinforcement each time (page 255)

shaping the technique of operant conditioning in which the desired behavior is "molded" by first rewarding any act similar to that behavior and then requiring closer and closer approximations to the desired behavior before giving the reward (page 255)

response chain learned reactions that follow one another in sequence, each reaction producing the signal for the next (page 256)

aversive control the process of influencing behavior by means of unpleasant stimuli (page 256)

negative reinforcement increasing the strength of a given response by removing or preventing a painful stimulus when the response occurs (page 256)

escape conditioning the training of an organism to remove or terminate an unpleasant stimulus (page 257)

avoidance conditioning the training of an organism to remove or withdraw from an unpleasant stimulus before it starts (page 257)

Drawing From Experience

Have you ever touched a hot iron and immediately pulled your hand away? Would you touch the iron again without testing it? We learn not to repeat behaviors that are harmful to us.

In the last section, you read about classical conditioning. Classical conditioning is one type of learning. In this section you will read about another type of learning called **operant conditioning.** This type of learning occurs when we receive rewards or punishments for our behavior.

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Organizing Your Thoughts

Use the diagram below to help you take notes as you read the summaries that follow. Think about the various kinds of reinforcement that affect behavior and fill in examples of reinforcers.

Types of Reinforcement

Positive

1. ______________
2. ______________

Negative

3. ______________
4. ______________
5. ______________

Read to Learn

Introduction (page 250)

Every day we do many things. How things turn out affects what we do in the future. We learn from our actions. We tend to repeat actions that result in rewards and avoid actions that result in punishment. This is operant conditioning.

6. Name something you did in the past 24 hours that resulted in some kind of reward.

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Reinforcement (page 251)

B.F. Skinner believed that people do things based on whether or not they will receive a reward or a punishment. If a reward makes you more likely to do something, it is called a **reinforcement.** There are two kinds of reinforcement. You can give people something as a reward for their behavior. This is called positive reinforcement. You can also reward people by taking away something unpleasant or painful. This is called negative reinforcement.

The strongest reinforcers are the ones that satisfy the basic needs of our body. These are called **primary reinforcers.** For example, food is a basic need. We need food to live. Food is a primary reinforcer. Reinforcers that are not directly connected to the needs of our body are called **secondary reinforcers.** Secondary reinforcers only work when we are conditioned to associate them with a primary reinforcer. If someone gives us money as a reward, it will strongly affect our behavior. Money is just a piece of paper or a round piece of metal. We cannot eat it or drink it. We have been conditioned, however, to associate money with our basic needs. We know we can buy food and other basic needs with money. Money is a secondary reinforcer.

7. Would you use a primary or secondary reinforcer to train a dog to shake hands? Why?

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Schedules of Reinforcement (page 253)

Rewards can be given in various ways. The plan for giving rewards is called a reinforcement schedule. You can reward people based on how often they do something. This is called a ratio schedule. If you reward people after they do something a specific number of times, you are using a **fixed-ratio schedule.** For example, if you pay a typist every time he or she types 10 pages for you, the typist is on a fixed-ratio schedule.

If people know they will be rewarded for their behavior, but do not know how often they have to do the behavior to get the reward, they are on a **variable-ratio schedule.** A slot machine uses a variable-ratio schedule. If you pull the handle enough times, eventually the machine will pay out money. The problem is that you do not know when you will be rewarded for pulling the handle.

Reinforcement schedules can also be based on time. This is called an interval schedule. You can reward people at specific times regardless of how often they have done something. If you reward people at the exact same time, you are using a **fixed-interval schedule.** Many teachers use a fixed-interval schedule for tests. The students know that the test will take place whether they study a lot or very little.

If you reward at random times, you are using a **variable-interval schedule.** A surprise quiz is an example of a teacher using a variable-interval schedule. Students know that a quiz could come at any time. In order to be ready, students need to study regularly since they cannot predict when they will be tested.

8. Which types of schedules have a long-lasting effect on behavior? Why?

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Shaping and Chaining (page 255)

Operant conditioning can be used to teach new skills. One type of operant conditioning that is good for teaching skills is called **shaping.** Shaping teaches a new behavior step by step. At first, you are given a reward for behavior similar to the skill you are learning. To keep getting the rewards, however, you must get better at the skill. The rewards shape your behavior.

If you want to learn a complex skill, you need to learn several different behaviors. You also have to learn how to put the behaviors together in the right order. For example, if you want to learn how to swim, you have to learn several

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READING 8

Weightlessness and Perception

Directions: Read the following selection, then answer the questions that follow.

In the second half of the 20th century space travel became a reality. Until the first space travelers braved the unknown, scientists and doctors could only speculate on how the human body would react to weightlessness. Some of their speculations proved true, such as space motion sickness that is commonly experienced by space travelers at the beginning of a flight. Others proved false. One thing has become quite clear—the body can adapt to weightlessness and then readjust to gravity. Researchers are attempting to use what has been learned in space to treat people on Earth with problems such as balance disorders.

. . . As most doctors can attest, it is difficult to predict what will happen when a brand-new challenge is presented to the human body. Time and again, space travel has revealed its marvelous and sometimes subtle adaptive ability. But only in the past few years have scientists begun to understand the body's responses to weightlessness, as the data—the cumulative experience of nearly 700 people spending a total of 58 person-years in space—have grown in quantity and quality. Pursuit of this knowledge is improving health care not only for those who journey into space but also for those of us stuck on the ground. The unexpected outcome of space medicine has been an enhanced understanding of how the human body works right here on Earth.

Feeling Gravity's Pull

Although many factors affect human health during spaceflight, weightlessness is the dominant and single most important one. The direct and indirect effects of weightlessness precipitate a cascade of interrelated responses that begin in three different types of tissue: gravity receptors, fluids and weight-bearing structures. Ultimately, the whole body, from bones to brain, reacts.

When space travelers grasp the wall of their spacecraft and pull and push their bodies back and forth, they say it feels as though they are stationary and the spacecraft is moving. The reason is embedded in our dependence on gravity for perceptual information.

The continuous and pervasive nature of gravity removes it from our daily consciousness. But even though we are only reminded of gravity's invisible hand from time to time by, say, varicose veins or an occasional lightheadedness on standing up, our bodies never forget. Whether we realize it or not, we have evolved a large number of silent, automatic reactions to cope with the constant stress of living in a downward-pulling world. Only when we decrease or increase the effective force of gravity on our bodies do we consciously perceive it. Otherwise our perception is indirect.

Our senses provide accurate information about the location of our center of mass and the relative positions of our body parts. This capability integrates signals from our eyes and ears with other information from the vestibular organs in our inner ear, from our muscles and joints, and from our senses of touch and pressure. Many of these signals are dependent on the size and direction of the constant terrestrial gravitational force.

The vestibular apparatus in the inner ear has two distinct components: the semicircular canals (three mutually perpendicular, fluid-filled tubes that contain hair cells connected to nerve fibers), which are sensitive to angular acceleration of the head; and the otolith organs (two sacs filled with calcium carbonate crystals embedded in a gel), which respond to linear acceleration. Because movement of the crystals in the otoliths generates the signal of acceleration to the brain and because the laws of physics relate that acceleration to a net force, gravity is always implicit in the signal. Thus, the otoliths have been referred to as gravity receptors. They are not the only ones. Mechanical receptors in the muscles, tendons and joints—as well as pressure receptors in the skin, particularly on the bottom of the feet—respond to the weight of limb segments and other body parts.

Removing gravity transforms these signals. The otoliths no longer perceive a downward bias to head movements. The limbs no longer have weight, so muscles are no longer required to contract and relax in the usual way to maintain posture and bring about movement. Touch and pressure receptors in the feet and ankles no longer signal the direction of down. These and other changes contribute to visual-orientation illusions and feelings of self-inversion, such as the feeling that the body or the spacecraft spontaneously reori-

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ents. In 1961 cosmonaut Gherman Titov reported vivid sensations of being upside down early in a spaceflight of only one day. Last year shuttle payload specialist Byron K. Lichtenberg, commenting on his earlier flight experiences, said, "When the main engines cut off, I immediately felt as though we had flipped 180 degrees." Such illusions can recur even after some time in space.

The lack of other critical sensory cues also confuses the brain. Although orbital flight is a perpetual free fall—the only difference from skydiving is that the spacecraft's forward velocity carries it around the curve of the planet—space travelers say they do not feel as if they are falling. The perception of falling probably depends on visual and airflow cues along with information from the direct gravity receptors. . . .

The aggregate of signal changes produces, in half or more of space travelers, a motion sickness that features many of the symptoms of terrestrial motion sickness: headache, impaired concentration, loss of appetite, stomach awareness, vomiting. Space motion sickness usually does not last beyond the first three days or so of weightlessness, but something similar has been reported by cosmonauts at the end of long flights.

At one time, scientists attributed space motion sickness to the unusual pattern of vestibular activity, which conflicts with the brain's expectations. Now it is clear that this explanation was simplistic. The sickness results from the convergence of a variety of factors, including the alteration of the patterns and levels of motor activity necessary to control the head itself. A similar motion sickness can also be elicited by computer systems designed to create virtual environments, through which one can navigate without the forces and sensory patterns present during real motion [Gibbs, W. W. (1994, December). Virtual reality check, *Scientific American.*]

Over time, the brain adapts to the new signals, and for some space travelers, "down" becomes simply where the feet are. The adaptation probably involves physiological changes in both receptors and nerve-cell patterns. Similar changes occur on the ground during our growth and maturation and during periods of major body-weight changes. The way we control our balance and avoid falls is an important and poorly understood part of physiology. Because otherwise healthy people returning from space initially have difficulty maintaining their balance but recover this sense rapidly, postflight studies may allow doctors to help those nonspace travelers who suffer a loss of balance on Earth.

Bernard Cohen of the Mount Sinai School of Medicine and Gilles Clement of the National Center for Scientific Research in Paris undertook just such a study after the Neurolab shuttle mission, which ended on May 3, [1998]. To connect this work with patients suffering from balance disorders, Barry W. Peterson of Northwestern University and a team of researchers, supported by the National Aeronautics and Space Administration and the National Institutes of Health, are creating the first whole-body computer model of human posture and balance control. . . .

Down to Earth

When space travelers return to the world of weight, complementary changes occur. If the effects of weightlessness are completely reversible, everything should return to its normal condition at some time after the flight. We now know that most systems in the body do work reversibly, at least over the intervals for which we have data. We do not yet know whether this is a general rule.

Space travelers certainly feel gravitationally challenged during and just after their descent. As one person said after nine days in space: "It's quite a shock. The first time I pushed myself up, I felt like I was lifting three times my weight." Returning space travelers report experiencing a variety of illusions—for example, during head motion it is their surroundings that seem to be moving—and they wobble while trying to stand straight, whether their eyes are open or closed.

Most of the body's systems return to normal within a few days or weeks of landing, with the possible exception of the musculoskeletal system. So far nothing indicates that humans cannot live and work in space for long periods and return to Earth to lead normal lives. This is clearly good news for denizens of the upcoming International Space Station and for any future interplanetary missions. In fact, the station, assembly of which should begin late this year or early next year, will provide researchers with a new opportunity to investigate the effects of space travel on humans. On its completion in five years, the station will have 46,000 cubic feet of work space (nearly five times more than the Mir or Skylab stations) and will include sophisticated laboratory equipment for the next generation of medical studies. Recognizing the need for a comprehensive attack on all the potential human risks of long-duration space travel, NASA has selected and funded a special research body, the National Space Biomedical Research Institute, to assist in defining and responding to those risks.

Many of the "normal" changes that take place in healthy people during or just after spaceflight are outwardly similar to "abnormal" events occurring in ill people on Earth. For example, most space travelers cannot stand quietly for 10 minutes just after landing without feeling faint. This so-called orthostatic intolerance is also experienced by patients who have stayed in bed for a long time and by some elderly people.

Source: White, R.J. (1998). Weightlessness and the human body. *Scientific American, 279 (3),* 58–63.

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Name ____________________ Date __________ Class __________

Understanding the Reading

Directions: Answer the following questions in the space provided.

1. What is the primary effect on the human body during spaceflight?

2. What structures of the inner ear are sensitive to side to side movement of the head?

3. What structures of the inner ear are sensitive to forward motion of the head?

4. What is the difference in perception between skydiving and spaceflight?

5. What Earth-based activity may create motion sickness similar to that experienced during spaceflight?

6. What immediate effect of gravity do space travelers experience when they return to Earth?

Thinking Critically

Directions: Answer the following questions on a separate sheet of paper.

7. Imagine that a recent editorial published in the leading newspaper in your community stated "We have only limited funds. Research dollars should be spent helping people here on Earth, not sending people into outer space." Write a rebuttal of this statement.

8. What would a typical day be like if you could not distinguish which way was up and which was down?

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CASE STUDY 8

Perfect Pitch

Directions: Read the following case study, then answer the questions that follow.

Background

About 1 in 2,000 people have perfect pitch. People with perfect pitch can hear a single note and name it or can sing the exact tone of a note each time without hearing any other tone for a reference. People with perfect pitch know that fluorescent lights hum in B-flat and toilets flush in E-flat. Although more musicians have perfect pitch than the general population, it is still a relatively rare talent. Musicians who do not have perfect pitch develop a keen sense of relative pitch. That is, they can sing a note if given another note as a reference.

Hypothesis

Perfect pitch is an inherited trait that must be nurtured and developed in order to survive.

Method and Results

Researchers have developed two theories about the influence of heredity. First, researchers at the University of Southern California at San Diego theorized that all infants are born with perfect pitch. They reached this conclusion by studying a sample of native Vietnamese and Chinese speakers. Both of these languages are tonal languages; that is, the same word may have several meanings depending on the tone used when the word is spoken. (Note: Tonal languages are not based on the sounds of an alphabet. There is no relationship between the way a word is written and the way the word is spoken. For example, all Chinese writing uses the same characters, but the two Chinese dialects, Mandarin and Cantonese, are so different that speakers of each language cannot understand one another.) Researchers found that all the people in their sample had perfect pitch. They concluded that perfect pitch is innate, and when nurtured will survive.

The second theory proposed that perfect pitch is an inherited trait; that is some, people inherit perfect pitch while others do not. Although the trait may be inherited, it must be nurtured in order to develop. Researchers at the University of California at San Francisco have proposed this theory. They sampled people from all walks of life using 40 pure tones. The participants wrote down the note that corresponded to the tone. In order to be classified as having perfect pitch, participants had to get 38 or more notes correct. Once researchers identified people with perfect pitch, they asked for a blood sample and asked if other family members share this trait.

Using neurobiology, researchers hoped to identify the specific gene and DNA sequence responsible for perfect pitch. To date, most genetic research has been targeted at identifying hereditary factors for certain diseases. Researchers believe that it is time to use the knowledge gained to identify other traits, such as perfect pitch.

Researchers have already identified that perfect pitch does seem to run in families. About 48 percent of the participants with perfect pitch reported that they had one or more family members with the same talent. One of the scientists involved in the research, Shai Shaham, has perfect pitch. This is an ability he shares with his father, sister, and younger brother.

The researchers are particularly interested in one ethnic group that has a high incidence of

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perfect pitch—the Ashkenazi Jews of Eastern Europe. For several centuries this relatively small group married primarily within their ethnic group. As a result their gene pool is considered homogeneous. Ashkenazi Jews who have or had perfect pitch are the late pianist Vladimir Horowitz, Metropolitan Opera's artistic director James Levine, and the San Francisco Symphony's music director, Michael Tilson Thomas. By concentrating on one ethnic group, researchers hoped to quickly narrow the search for the telltale DNA.

Researchers also asked participants a second question: Did you study music as a young child? The findings indicated that early music training is essential to maintaining one's perfect pitch ability. Most participants who have perfect pitch began music lessons by the age of 6. Researchers found that only 2 percent of those with perfect pitch began music training after the age of 12. These findings led researchers to conclude that the ability to perceive pitch perfectly is inherited, but the ability must be nurtured through exposure to music and music education.

Conclusions

Researchers still do not fully understand how we perceive the world. As science and technology develop, they hope to be able to clearly identify which perceptual traits and abilities are inherited and which are learned. The most conclusive research to date indicates that perfect pitch does have an inherited component. The sample of tonal language speakers was too small to conclude that perfect pitch is an innate ability.

Even if perfect pitch is inherited, it seems apparent that the ability must be nurtured and developed. Most educators would not recommend forcing children to take music lessons at a very young age, but they do recommend exposing children to music, especially classical music.

Sources: **Dickinson, A.** (1999). Little musicians. *Time, 154 (24),* 114; **Krieger, L.** (1997). Perfect pitch: Nature or nurture. *San Francisco Examiner,* A15.

Understanding the Case Study

Directions: Answer the following questions on a separate sheet of paper.

1. What is perfect pitch?
2. What was the researchers' hypothesis?
3. Who did the researchers in San Diego use as participants? Why were these participants used?
4. What did the researchers find with the sample of people who spoke a tonal language?
5. What did the researchers at the University of San Francisco use to test for perfect pitch?
6. What did the San Francisco researchers conclude about nature versus nurture as it relates to perfect pitch?

Thinking Critically

Directions: Answer the following questions on a separate sheet of paper.

7. Do you think that all speakers of tonal languages have perfect pitch? How would you test your hypothesis?
8. What other perceptual abilities may have an inherited and a learned component?

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READING 9

Different Outlooks

Directions: Read the following selection, then answer the questions that follow.

Cognitive learning theorists have identified that optimists and pessimists process information differently. Many studies have shown that optimists are healthier, get better jobs, advance more quickly in their careers, are better athletes, and may live longer. Optimists are less likely to succumb to helplessness, even when encountering numerous bad events beyond their control.

Learned helplessness is the giving-up reaction, the quitting response that follows from the belief that whatever you do doesn't matter. *Explanatory style* is the manner in which you habitually explain to yourself why events happen. It is the great modulator of learned helplessness. An optimistic explanatory style stops helplessness, whereas a pessimistic explanatory style spreads helplessness. Your way of explaining events to yourself determines how helpless you can become, or how energized, when you encounter the everyday setbacks as well as momentous defeats. . . .

How do *you* think about the causes of the misfortunes, small and large, that befall you? Some people, the ones who give up easily, habitually say of their misfortune: "It's me, it's going to last forever, it's going to undermine everything I do." Others, those who resist giving in to misfortune, say: "It was just circumstances, it's going away quickly anyway, and, besides, there's much more in life."

Your habitual way of explaining bad events, your explanatory style, is more than just the words you mouth when you fail. It is a habit of thought, learned in childhood and adolescence. Your explanatory style stems directly from your view of your place in the world—whether you think you are valuable and deserving, or worthless and hopeless. It is the hallmark of whether you are an optimist or a pessimist.

There are three crucial dimensions to your explanatory style: permanence, pervasiveness, and personalization.

Permanence

People who give up easily believe the causes of bad events that happen to them are permanent: the bad events will persist, will always be there to affect their lives. People who resist helplessness believe the causes of bad events are temporary.

PERMANENT *(Pessimistic)*
"I'm all washed up."
"Diets never work."
"You will always nag."

TEMPORARY *(Optimistic)*
"I'm exhausted."
"Diets don't work when you eat out."
"You nag when I don't clean my room."

. . . If you think about bad things in *always's* and *never's* and abiding traits, you have a permanent, pessimistic style. If you think in *sometimes's* and *lately's*, if you use qualifiers and blame bad events on transient conditions, you have an optimistic style. . . .

The *optimistic style of explaining good events is just the opposite of the optimistic style of explaining bad events.* People who believe good events have permanent causes are more optimistic than people who believe they have temporary causes.

TEMPORARY *(Pessimistic)*
"It's my lucky day."
"I try hard."
"My rival got tired."

PERMANENT *(Optimistic)*
"I'm always lucky."
"I'm talented."
"My rival is no good."

Optimistic people explain good events to themselves in terms of permanent causes: traits, abilities, *always's*. Pessimists name transient causes: moods, effort, *sometimes's*. . . .

People who believe good events have permanent causes try even harder after they succeed. People who see temporary reasons for good events may give up even when they succeed, believing success was a fluke.

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Name ______________________ Date ____________ Class ____________

Pervasiveness: Specific vs. Universal

Permanence is about time. Pervasiveness is about space. . . .

It comes down to this: people who make universal explanations for their failures give up on everything when a failure strikes in one area. People who make specific explanations may become hopeless in that one part of their lives yet march stalwartly on in the others.

Here are some universal and some specific explanations of bad events:

UNIVERSAL *(Pessimistic)*
"All teachers are unfair."
"I'm repulsive."
"Books are useless."

SPECIFIC *(Optimistic)*
"Professor Seligman is unfair."
"I'm repulsive to him."
"This book is useless."

. . . Now for the converse. The *optimistic explanatory style for good events is opposite that for bad events.* The optimist believes that events have specific causes, while good events will enhance everything he does; the pessimist believes that bad events have universal causes and that good events are caused by specific factors. . . .

SPECIFIC *(Pessimistic)*
"I'm smart at math."
"My broker knows oil stocks."
"I was charming to her."

UNIVERSAL *(Optimistic)*
"I'm smart."
"My broker knows Wall Street."
"I was charming."

Personalization: Internal vs. External

When bad things happen, we can blame ourselves (internalize) or we can blame other people or circumstances (externalize). People who blame themselves when they fail have no self-esteem as a consequence. They think they are worthless, talentless, and unlovable. People who blame external events do not lose self-esteem when bad events strike. On the whole, they like themselves better than people who blame themselves do.

Low self-esteem usually comes from internal style for bad events.

INTERNAL *(Low self-esteem)*
"I'm stupid."
"I have no talent at poker."
"I'm insecure."

EXTERNAL *(High self-esteem)*
"You're stupid."
"I have no luck at poker."
"I grew up in poverty."

. . . Of the three dimensions of explanatory style, personalization is the easiest to understand. After all, one of the first things a child learns to say is "He did it, not me!" Personalization is also the easiest dimension to overrate. It controls only how you *feel* about yourself, but pervasiveness and permanence—the more important dimensions—control what you *do:* how long you are helpless and across how many situations.

Personalization is the only dimension simple to fake. If I tell you to talk about your troubles in an external way now, you will be able to do it—even if you are a chronic internalizer. You can chatter along, pretending to blame your troubles on others. However, if you are a pessimist and I tell you to talk about your troubles as having temporary and specific causes, you will not be able to do it. . . .

The *optimistic style of explaining good events is the opposite of that used for bad events. It's internal rather than external.* People who believe they cause good things tend to like themselves better than people who believe good things come from other people or circumstances.

EXTERNAL *(Low self-esteem)*
"A stroke of luck. . ."
"My teammates' skill. . ."

INTERNAL *(High self-esteem)*
"I can take advantage of luck."
"My skill. . ."

Source: Seligman, M.E.P. (1991). *Learned Optimism.* New York: Alfred A. Knopf, 15–16, 43–50.

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Name ______________________ Date ____________ Class ____________

Understanding the Reading

Directions: Answer the following questions in the space provided.

1. What are the two explanatory styles?

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2. When do you develop your explanatory style?

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3. What are the three dimensions of the explanatory style?

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4. Which of the dimensions controls what you do?

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Thinking Critically

Directions: Answer the following questions in the space provided.

5. List three good events and three bad events that have occurred in your life in the past month. Describe your reactions to the events. Classify each description using the three dimensions listed in the reading. From these results, do you tend to be an optimist or a pessimist?

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6. Does being an optimist mean that you always blame others for your troubles? Explain your reasoning.

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CASE STUDY 9

Conditioning Aggression

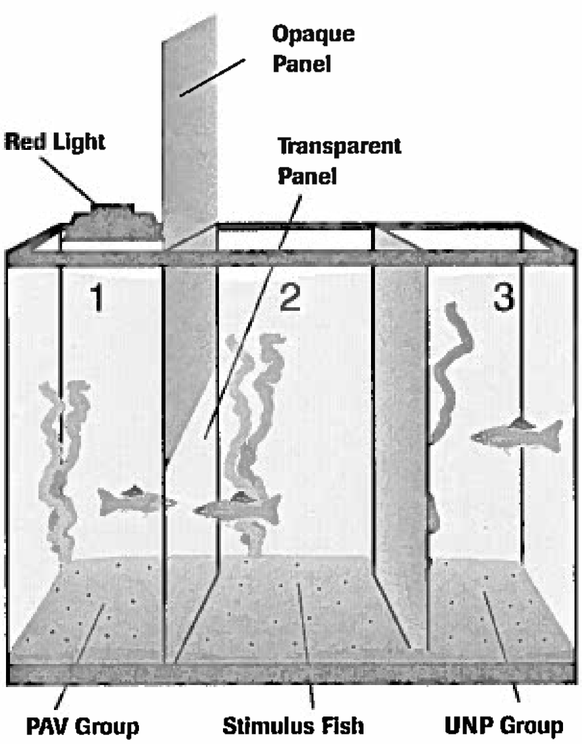
Directions: Read the following case study, then answer the questions that follow.

Male blue gourami fish establish territories that contain good nesting sites. Once established, males defend their sites by biting and tail beating rivals who enter their territory. The loser of the fight displays recognizable submission. The submissive posture includes folded fins, faded color, and a more horizontal body angle.

Karen Hollis and a group of researchers set out to answer the question: Are conditioned fish more likely to continue winning even when the conditioned stimulus is not present?

Thirty-six adult male blue gouramis were used. The researchers divided the aquariums into three sections (left, right, and center) using two acrylic panels, one opaque and one transparent, that could be raised and lowered (see diagram below). Researchers placed 36 fish in the left and right compartments. Throughout the study, they remained either on the left or the right, even when moved to other aquariums.

The center compartments contained stimulus fish during the training phase. The stimulus fish served as the unconditioned stimulus since the sight of another male fish causes the blue gourami to defend his territory. Training occurred over 24 days. The researchers divided the 36 fish into two groups. Each fish in the Pavlovian-conditioned group (PAV) was conditioned using a red light (conditioned stimulus) paired with the presentation of a stimulus fish (unconditioned stimulus).



Although the fish in the unconditioned group (UNP) saw both the red light and the stimulus fish during training, the light and stimulus fish were never presented together. Therefore, no conditioning occurred.

After training, researchers conducted a two-part contest. In the first part of the contest, researchers paired some of the PAV with UNP. The PAV were presented with the red light immediately before the contest. They won 80 percent of the contests against their UNP counterparts. In the second part of the contest, Pavlovian-conditioned fish encountered each other; however, researchers presented some with the red light (PAV-L) immediately before the contest and others with no light (PAV-NL). PAV-L won all of the contests against the PAV-NL.

After two days of rest, the winners and losers faced another contest, this time with a different male fish. All of the Pavlovian-conditioned fish that won their first encounter also won their second contest.

The findings indicate that conditioned males were better able to vigorously defend their territories. While the exact physiological mechanism is unknown, it appears that Pavlovian-conditioned males had a competitive advantage. The long-term consequences of conditioning seem also to be positive since it appears that winning previous contests sets the stage for winning future contests. The results seem to indicate that the winners continue to win.

Source: Hollis, Karen, et al. (1995). Pavlovian conditioning of aggressive behavior in blue gourami fish *(Trichogaster trichopterus)*: Winners become winners and losers stay losers. *Journal of Comparative Psychology, 109 (2)*, 123–33.

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Understanding the Case Study

Directions: Answer the following questions in the space provided.

1. For what purpose do male blue gourami fish establish territories?

2. What was the unconditioned stimulus and conditioned stimulus in this study?

3. In the first contest, how were the contest pairings set up?

4. In the second contest, what percentage of losers from Contest 1 defeated a winner from Contest 1?

Thinking Critically

Directions: Answer the following questions in the space provided.

5. Why do you think that Pavlovian-conditioned fish that were not shown the light (PAV-NL) performed more poorly than the unconditioned fish (UNP) when facing PAV-L fish?

6. Would conditioning aggressiveness in other types of animals or humans show similar results? Explain your answer.

7. In addition to conditioning, what other explanations are possible for the finding that winners keep winning?