Furthermore, despite behavior therapists' commitments to some form of behaviorism, contemporary theories of social and cognitive learning clearly recognize the interplay of behavior, the environment, and the *person* in determining psychological processes such as learning: "In the social-cognitive approach, the influence of environmental events on behavior is largely determined by cognitive processes governing how environmental influences are perceived and how the individual interprets them" (Wilson, 1995, p. 198). Far from being a robotic automaton, the person in contemporary behavior theory is assigned a central role in selecting the stimuli to be attended to, appraising the situation in the light of personal meanings, and evaluating his or her coping resources in determining which behaviors to bring into play.

THERAPE - OLSEN (1997)

Chapter 2

Classical Conditioning Principles and Anxiety-Reduction Procedures

Susan[1] had been so terrified of spiders for so long that she never really believed that she could completely overcome her phobia. As she told her best friend after she terminated her course of therapy, she didn't know who was more surprised at the result—she or the psychiatrist who had recommended behavior therapy. Susan had had many misgivings when she first made the appointment with the psychiatrist. Her phobia was so severe at that time that she was too afraid even to say the word *spider;* the psychiatrist could only figure out what she was afraid of after they had played an elaborate guessing game. To give him an idea of the severity of her phobia, Susan explained that she once saw a tiny one (i.e., a spider) out of the corner of her eye while driving, and in her panic, she had nearly driven off the road. He suggested that a minor tranquilizer might give her some relief, but Susan was reluctant to take drugs and asked if there was an alternative. The psychiatrist recommended that she consult a psychologist specializing in behavior therapy.

Susan's friend wanted to know what actually happens in behavior therapy. Susan found it difficult to describe. She explained that she and her therapist had used at least two separate treatment techniques, and if she had had a different problem, such as depression or obsessional thoughts, different techniques would have been used. One form of treatment she had had was called *systematic desensitization* and it had involved a great deal of relaxation, which had been very pleasant and calming. Then she had imagined a variety of scenes involving spiders, taking the easy ones first. She and the therapist had carefully worked out a list of spider scenes and Susan had placed them in order of how much anxiety they evoked, using a scale from 0 (no anxiety) to 100 (total panic). The first scene, rated at 5, was: "Your neighbor tells you she saw one in her garage."

The therapist had spent several therapy sessions training Susan in relaxation techniques before they actually started the desensitization. The treatment itself began with half an hour of relaxation induction, then the therapist gently described the first scene from the list. Susan concentrated on imagining the scene while continuing to relax deeply. If she ever became anxious while imagining a scene, she simply told the therapist, who backed off immediately and concentrated purely on relaxation instructions for a few minutes before returning to the imagined scene. They followed this procedure for several weeks.

Eventually, Susan started confronting real spiders, following a procedure called *graduated real-life practice*. Before Susan arrived for a session, the therapist had found a tiny, dead spider, put it in a jar with the lid tightly closed, and placed it on a table in the clinic's conference room. Susan started at the opposite end of the corridor outside the conference room, and gradually moved closer, pausing when she felt too anxious to proceed. She tried to move beyond that point, taking her time and regrouping after every step. Over just three sessions, she progressed to the point at which she could touch the glass jar with the spider inside. Only a few more sessions were needed to remove her anxiety completely. When Susan returned to the psychiatrist for a routine follow-up four months after her first visit, he had asked how things were working out with the psychologist. Susan replied by taking a glass jar out of her pocketbook, opening the lid, tipping a large spider from the jar into her hand, and saying: "I think I'm cured, don't you?"

In this chapter we shall focus on a group of techniques that were developed chiefly for use in outpatient settings. Most of these techniques were designed to reduce *anxiety*,[2] a pervasive clinical problem that was regarded by traditional clinicians as fundamental to the "neuroses." Assertiveness training, systematic desensitization, aversion therapy, graduated real-life practice, and various forms of flooding were initially inspired by principles of classical conditioning and extinction, and were described in significant early books such as *Behavior Therapy Techniques* (Wolpe & Lazarus, 1966) and *The Causes and Cures of Neurosis* (Eysenck & Rachman, 1965). Our discussion of these techniques begins with an outline of the theories from which they were drawn.

Theoretical Principles

Basic Concepts

Classical Conditioning

To study *classical conditioning*, we begin by identifying a reflex response, one that is triggered routinely by a particular stimulus. In humans, these reflexes include the eyeblink response to dust or a puff of air in the eye, and the reflex of the patellar tendon (the knee-jerk reflex) in response to a tap in the right place by the doctor's hammer. Such reflexes appear routinely without any particular training, so they are assumed to be unlearned or unconditioned. Classical conditioning takes place when a *new* stimulus acquires the power to produce one of these reflex responses. The term *classical conditioning* refers both to the experimental procedure itself and to the results of that procedure.

In other words, suppose you have a reflex that makes you sneeze whenever you are within two feet of a flower. You have had this reflex all your life, and as far as you know, you did not have to go through any elaborate learning process to acquire it. Therefore, your sneezing in response to flowers is unlearned, or *unconditioned*. The stimulus is the flower, your response is the sneeze, and the reflex is the stimulus-response relationship (your tendency to sneeze in response to flowers). Because this is an unconditioned reflex, the flower is an *unconditioned stimulus* and the sneeze represents an *unconditioned response*. Classical conditioning is a process through which a new stimulus takes on the power to evoke the unconditioned response. For example, suppose that your friend Chris normally evokes no particular reflex in you as far as you are aware. But one day Chris approaches you with a large bunch of daffodils, and you break out into an uncontrollable fit of sneezing. By coincidence, the same thing happens again the next day, and the next. On the fourth day Chris comes up to you again, and you start sneezing—but Chris is not carrying any daffodils today. Classical conditioning, which we shall describe next, provides a description of the process through which Chris became a stimulus capable of eliciting your sneezing reflex.

Ivan Petrovich Pavlov (1849–1936) was a Russian physiologist interested in the workings of the salivary reflex in dogs. The usual experimental procedure was for the researcher to place meat powder (the stimulus) in a dog's mouth. Without special training of any kind, a healthy dog responded quickly by producing saliva (the response). As a result, the salivary reflex could be studied quite conveniently. The dogs used in the experiments were restrained in a special harness, and a hole had been made surgically in each dog's cheek to allow drops of saliva to be collected in a tube and measured.

Although his training was in physiology, not psychology, and his research was designed to throw light on digestive processes, not learning phenomena, Pavlov is best known for his studies of conditioning. He showed that stimuli that previously did not call forth a reflex response like salivation may come to do so following a particular experimental procedure. That is, he demonstrated that dogs could learn to salivate in response to a bell being rung, or a whistle being blown, or even the presentation of a diagram of a circle on a piece of white card. The experimental procedure that produced such unexpected results involved repeatedly presenting the new stimulus a fraction of a second before the reflex-eliciting stimulus. This *pairing* of the two stimuli was made repeatedly until the response normally produced in the reflex began to be produced by the new stimulus. Pavlov discovered this phenomenon entirely by accident.

When they were new to the situation, Pavlov's dogs did not react particularly when a white-coated laboratory assistant entered the room. However, the stimulus of meat powder in the mouth routinely elicited salivation, whether or not the dogs were used to the laboratory. (The meat powder stimulus and the salivation response together form the salivary reflex, an unlearned or unconditioned reflex.) The appearance of the assistant routinely preceded the delivery of food to the dogs. After a few days of exposure to this standard sequence of events, the dogs began to salivate as soon as the assistant appeared. This phenomenon, now well-known as *classical conditioning*, was Pavlov's accidental discovery.

In classical conditioning, the new stimulus (the entry of the assistant) takes on the power to trigger salivation because the presentation of food, the reflex-eliciting stimulus, always followed quickly. The pairing of these stimuli (the assistant and the meat powder) in just the right way results in an increase in the number of stimuli that can kick off the

reflex. At first, only food elicited saliva, but after conditioning, both food and the appearance of the assistant could do so. When conditioning has occurred, the previously neutral stimulus (the assistant) has become a *conditioned stimulus.*

At first, this new phenomenon was a distinct annoyance that tended to disrupt Pavlov's experiments; his careful measurements of the timing of the salivary response were thrown off by the presence of these "psychic secretions." Yet, he began to make a systematic study of the phenomenon. Because the comings and goings of laboratory assistants were too haphazard to allow precise experimentation, Pavlov substituted the ringing of a bell, a stimulus that could be precisely controlled and timed. Pavlov (1927) reported a series of investigations to determine the ideal circumstances that produce conditioning: the time interval between stimulus presentations, the duration of each stimulus, and so on. The general procedure is depicted in Figure 2–1.

Notice that the meat powder is the unconditioned stimulus and the salivation the unconditioned response in Figure 2–1. Presenting meat is a stimulus to the animal because it represents a detectable change in the environment. The dog's salivation is a response, an activity that can measured by an experimenter. For meat to produce the response requires no conditioning (learning), so the response is unconditioned. But when the ringing of a bell produces salivation in a dog, conditioning must have occurred. What the salivation is called depends on which stimulus elicited it. If meat powder is the stimulus, the salivation is an *unconditioned response.* If the sound of a bell is the stimulus, the salivation is a *conditioned response.* If the bell produces salivation, the bell has become a *conditioned stimulus.*

One aspect of conditioning that Pavlov soon discovered was *stimulus generalization.* Suppose that meat powder usually elicits about 10 drops of saliva, and that, after conditioning, ringing the bell produces about 5 drops. Pavlov observed that a stimulus similar to

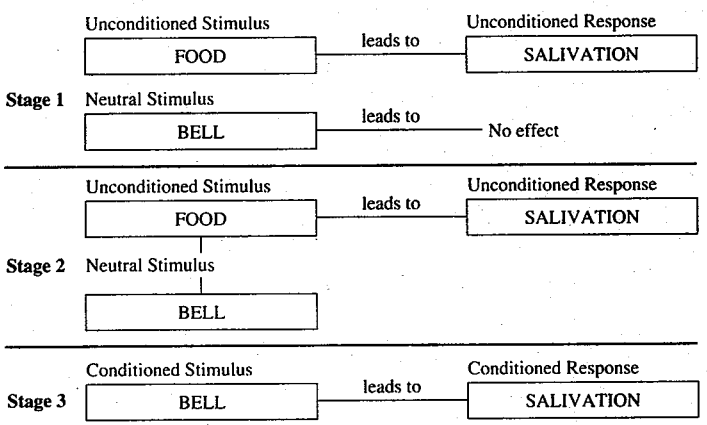

FIGURE 2–1 The Three Basic Stages of Classical Conditioning

Source: From L. A. Lefton, *Psychology,* 2nd ed. Copyright © 1982 by Allyn and Bacon. Reprinted by permission.

the ringing of the bell would also produce salivation, but not as much. For example, ringing a different bell with a lower or higher pitch might produce 3 drops of saliva. Interestingly enough, there was a systematic relationship between measures of the conditioned stimulus (the pitch of the bell, for instance) and measures of the conditioned response (number of drops of saliva). The more similar the stimulus was to the original conditioned stimulus, the greater the response.

The counterpart of conditioning is *extinction.* In the extinction process, the conditioned reflex gradually dwindles away (the conditioned stimulus loses its power to produce the conditioned response). The procedure involves presenting the conditioned stimulus repeatedly without the original stimulus, the unconditioned stimulus. For example, if the laboratory assistant appears repeatedly without the meat powder being presented immediately afterwards, the appearance of the assistant will eventually fail to evoke salivation. Notice that, like conditioning, extinction refers both to the procedure and to the effects of the procedure, or the process. The extinction *procedure* ("experimental extinction") involves repeatedly presenting the conditioned stimulus without the unconditioned stimulus, and the extinction *process* is the fading of the conditioned response to the conditioned stimulus.

Drooling in dogs is of no great practical significance to psychology in itself, but the principles of classical conditioning have been extremely important. Because it can occur whenever a new stimulus is repeatedly presented together with a reflex-eliciting stimulus, behavior therapists have taken classical conditioning seriously as a possible explanation for some mental health problems. Take the example of anxiety. As an emotion that involves various bodily responses like changes in heart rate and respiration, anxiety can be studied as a reflex response, conditioned or unconditioned. Certain stimuli—unexpected loud noises or sudden falling, for example—will automatically produce increased heart rate and respiration as unconditioned responses. If some other stimulus event, something that does not normally produce the response, occurs immediately before the unconditioned stimulus, then the new stimulus can come to provoke responses that might be labeled as anxiety.

Suppose someone is looking at an abstract painting in an art museum. Further suppose that the painting elicits no particular response in the viewer. Suppose, even further, that an earthquake strikes, and the museum visitor is in fear of imminent death as the walls and floor tremble violently. Assuming that the visitor survives the earth tremor, any further encounter with the piece of artwork could, by classical conditioning, immediately produce feelings of terror or alarm. Because it was paired with stimuli that elicited fear, the picture has become a conditioned stimulus. If the person had a similar reaction to other paintings by the same artist, that would be an example of stimulus generalization.

Clinical Implications

Behavior therapists have used classical conditioning principles to understand how clients' problems developed and to devise treatment procedures. Consider the example of Frank T., introduced at the end of Chapter 1. His social anxiety may have arisen because people were repeatedly paired with threatening and painful experiences, so that people became conditioned stimuli that evoked anxiety in Frank. Covert sensitization, a technique that was

employed to treat Frank's exhibitionism, can also be understood in terms of classical conditioning. The unpleasant fantasy imagined by the client (being arrested) is seen as the unconditioned stimulus, which leads to uncomfortable reactions (fear, shame) that form the unconditioned response. The idea is to turn the stimulus that used to encourage the abnormal behavior into a conditioned stimulus for an unpleasant response. In Frank's case, the aim was to make the sight of a woman walking alone (in the context of his inappropriate desire to expose himself) elicit responses of concern, apprehension, and discomfort.

Classical Conditioning of Anxiety

The fear that signals genuine danger is helpful, of course, but the anxiety that the clients of mental health professionals experience can be highly distressing and potentially handicapping. As you will see in a later chapter, the negative behavioral effects of anxiety disorders can include avoiding objects or situations that are objectively harmless, engaging in compulsive rituals designed to ward off the threat of danger, and suffering impairment in routine behavior. For example, a client with a phobia of heights might avoid using elevators; a client with fears of contamination by unseen filth might engage in prolonged cleansing rituals; and a client with a social phobia who is giving an important speech before a large group might find his or her performance disrupted in one way or another by anxiety. In developing treatments for anxiety problems like these, the behavior therapy pioneers drew their theoretical principles from laboratory research on learning, especially classical conditioning, and were particularly impressed by the famous demonstration of fear conditioning in Little Albert by Watson and Rayner (1920), as described in Chapter 1.

Recall that Albert developed a new fear of a white rat when the researchers paired its appearance with the sound of a steel bar being struck. Because the boy's behavior showed typical classical conditioning phenomena such as stimulus generalization, Watson and Rayner speculated that naturally occurring phobias might also have developed through classical conditioning. Accordingly, behavior therapists tried to understand a client's anxiety reaction as a conditioned response (CR), resulting from the accidental pairing of stimuli in his or her environment. This view led to the study of extinction procedures as laboratory parallels to psychological treatment. For example, a phobic client who fears and avoids spiders may have developed the CR of anxiety after an unpleasant event of some kind coincided with the presence of a spider. Treatment would be based on the principle of extinction; the technique would be to encourage the client to confront the conditioned stimulus repeatedly in the absence of the unconditioned stimulus. That would mean confronting the spider without the unpleasant event that presumably was present when the phobia started. Since we assume that the unpleasant event is now history, the client is really operating under conditions of extinction anyway, and the therapist simply needs to hasten the extinction process.

THE CASE OF SUSAN B.

Susan, who was introduced at the start of the chapter, had developed her phobia of spiders after a single terrifying event. She was 10 years old when some of her cousins were visiting on a hot day in summer. As part of a game they were playing, her brothers and some of the cousins bodily forced her into a small shed in the backyard and locked her in. It was dark, hot, and stuffy in the shed, and she found it hard to breathe. Feeling panicky, she struggled to push the door open without success. At that moment her hair brushed against a large spider's web, and several large spiders crawled over her face and under her clothes. She screamed and struggled to get out, but the other children thought it was all part of the game and laughed at her. When she was eventually released after what seemed to her to be an eternity, Susan was trembling and crying and looked pale. She felt weak, and her parents noticed that she was tense and shivery for over an hour after the episode. The family doctor was called in and sedating medication was required. This single experience marked the beginning of her phobia.

Years later, Susan continued to be distressed and handicapped by her horror of spiders. Anything that even resembled a spider, such as the leafy stem of a tomato, startled her so that she would shy away. On one occasion she suddenly saw a large spider when she was ironing some clothes. She screamed, flung up her arms, and the iron crashed through a window. As she explained it, her reason for seeking therapy was that she and her husband were planning to start a family. "What would happen," she wondered, "if I were holding my baby when I suddenly saw a spider?"

Theoretically, the experience of being shoved into a cramped, hot, and airless shed while finding it hard to breathe and with escape impossible constitutes an aversive unconditioned stimulus (UCS) in Pavlovian terms. This stimulus situation would automatically elicit reflex responses that could include sensations of alarm and fear (the unconditioned response, or UCR). The spider, simply by its presence as an attention-getting stimulus, can become a conditioned stimulus (CS) by pairing with the UCS. As a result, responses similar to those initially provoked by the emotion-arousing event are elicited in the client by the sight of a spider, or, by stimulus generalization, by the sight of anything that looks like one (such as a green tomato top). Treatment following from this idea would involve some form of extinction procedure so that the feared stimulus loses its power to evoke anxiety. Susan's phobia was successfully removed after a course of treatment with systematic desensitization and graduated real-life practice, two of the treatment procedures described later in this chapter.

Classic Studies

Conditioned Suppression

Estes and Skinner (1941) described a laboratory study of anxiety that produced the phenomenon of *conditioned suppression*. Rats responded to a schedule of positive reinforcement, pressing levers to obtain food in the usual operant learning procedure. While the rats continued to respond, the experimenters suddenly presented an audible tone that was sounded for three minutes before terminating together with a brief electric shock. The tone-plus-shock stimulus combination was delivered at random intervals, unrelated to the rats' behavior. The results were that the rats began to slow their response rates at the onset of the tone and before the shock was delivered. The authors had therefore demonstrated "the conditioning of a state of anxiety to the tone, where the primary index was a reduction in

strength of the hunger-motivated lever pressing behavior" (Estes & Skinner, 1941/1968, p. 245). Because the sound of the tone, after conditioning, suppressed the lever-pressing, the effect was labeled *conditioned suppression*. Extinction of this conditioned suppression was seen when the tone was presented for prolonged periods of a half hour or more without the shock ensuing.

Conditioned suppression has some parallels in clinical settings.

THE CASE OF LARRY

Larry, a mill worker with social phobia, was so apprehensive about attending safety meetings at work that he would make up any excuse not to go. But, since the meetings were mandatory and could be convened unpredictably and at very short notice, Larry was often unable to escape in time. To make matters worse, the foreman in charge of the meetings had been promoted to this position over Larry, who had competed for the job and lost despite having worked for the company longer than any other applicant. Larry avoided this man whenever possible, and always felt uneasy in his presence.

At the safety meetings, the foreman would randomly call on people to speak, and Larry's chief fear was of being thrust in front of the room and finding himself tongue-tied and embarrassed in front of the group. If he had been alone at home, he could have easily stood up and delivered a few sentences about safety procedures. He might even have managed fairly well in front of the group, if the foreman had not been there. But the knowledge that his rival was watching his every move while he spoke had the same effect on Larry as the tone had had on the rats of Estes and Skinner: In each case, the behavior was disrupted. Larry stuttered and forgot what he was going to say; the rats slowed down their lever pressing. The foreman, like the tone to the rats, was a reminder of aversive experiences (disappointment at not gaining the promotion), so that the mere presence of that conditioned stimulus was enough to suppress Larry's current behavior.

Wolpe's Experiments

In a series of laboratory experiments beginning in the 1940s, Joseph Wolpe (1958, 1981) deliberately induced conditioned fear[3] in cats in order to find efficient ways to remove it. His intent was to learn what he could about *removing* the cats' conditioned fears, apply these findings in the clinical arena, and then use them to develop treatments for his clients with anxiety disorders. The behavior therapy techniques of assertiveness training and systematic desensitization were derived directly from the results of these studies with cats.

The impetus for Wolpe's experiments with cats was the work of Jules Masserman (1943), an American psychiatrist who had produced lasting fear in cats by placing them in cages and delivering electric shocks as they approached food. After he had delivered a series of such shocks, Masserman disconnected the shock mechanism and observed the cats for signs of conditioned fear. How did Masserman know that the cats had become fearful? There were two indications: First, the cats would escape from or avoid the cages when given the opportunity (they had not done so before the shocks were introduced). Second, when the cats were forced into the cages, they would not eat there, even if they had

not eaten for some time and were presumably hungry. Furthermore, the cats' experimentally induced fears *persisted* long after the shock was disconnected. Masserman had to provide "treatment" to remove the fear: He would place a cat in the cage and then force the cat toward the food by means of a movable partition. When the cat began to eat, the anxiety would fade away gradually.

Masserman's studies of fear conditioning in cats were partly inspired by psychoanalytic theory, which traces anxiety disorders ("neuroses") to conflict between opposing impulses. In the 1940s most theorists assumed that conflict was essential to the development of any neurosis (Yates, 1962). This notion was supported by Pavlov's (1927) findings on *experimental neurosis*, a phenomenon in which laboratory dogs developed strong fear of the experimental environment as a result of conflict between opposing responses after difficult training tasks. Because these original studies of Masserman and Pavlov suggested that approach-avoidance conflict was necessary in inducing conditioned fear, Wolpe included similar procedures in his studies.

It is important to note that Masserman's experimental procedures allowed more than one process to operate. Not only were his cats subjected to approach-avoidance conflict but they were also subjected to aversive *classical conditioning*. Initially, the cage was a neutral stimulus that elicited no particular reflex responses in the cats. Electric shock can clearly be seen as a UCS, one that automatically elicits UCRs of pain and fear. Pairing the cage with shock allows the cage to become a CS, eventually eliciting responses (CRs) similar to those elicited by shock. Thus, the cage can become an aversive CS, eliciting conditioned fear (or anxiety) as a CR, by classical conditioning. Furthermore, one would predict that, once the shock unit has been disconnected, the CR would undergo extinction (because the cage, the CS, is no longer paired with the shock, the UCS). Masserman's technique of forcing the cats toward the food by means of the movable partition could therefore work by extinction, because the cats were exposed to the CS of the cage environment without the UCS.

Fear Conditioning. Wolpe (1958) induced conditioned fear in 12 cats. These were divided into two experimental groups of 6, each group following a different procedure. The first procedure was similar to that of Estes and Skinner (1941); the 6 cats in this condition were shocked individually in an experimental cage following the sounding of a tone, each cat receiving 5 to 10 shocks. The second procedure was similar to Masserman's (1943); these 6 cats were first trained to approach food in response to the tone, then they were shocked as they approached the food (the idea being to create conflict between approaching and avoiding the food). All 12 cats showed "neurotic symptoms" after the shocks were discontinued: (1) they resisted being placed in the cage, (2) they gave signs of anxiety when inside the cage, and (3) they refused to eat meat pellets anywhere in the cage even after three days of starvation. These responses were greater, and more generalized, when the tone was present.

There were few differences in the responses of the two experimental groups, so Wolpe had shown that inducing conflict was unnecessary in creating such experimental neuroses (Wolpe, 1982). The procedures and their effects can be seen as examples of classical conditioning, and there is a parallel with conditioned suppression because the cats would not eat in the presence of the cage or the tone.

Removal of Fear. For 3 cats, Wolpe followed Masserman's (1943) technique of forcing them toward food during experimental extinction. The procedure was effective, as it had been for Masserman. The remaining 9 cats were treated differently because "the fact that the neurotic reactions of the cats were associated with inhibition of feeding suggested that under different conditions feeding might inhibit the neurotic reactions: in other words, that the two reactions might be reciprocally inhibitory" (Wolpe, 1958, p. 55). Wolpe fed the cats by hand in the cage under experimental extinction conditions; no tones or shocks were presented. Eventually, 4 of the 9 cats learned to eat from the food box in the cage. The remaining 5 cats, which had not responded to the hand-feeding procedure, were offered food outside the cage and were gradually brought nearer to the experimental cage. All cats eventually learned to eat from the original cage.

The Return of Fear. No further shock was delivered, but the tone was reintroduced after the anxiety-reduction procedures just described. Anxiety returned in all of the cats. To remove the anxiety again, Wolpe fed 2 of the 9 cats at decreasing distances from the cage and the tone. The other 7 cats were fed in the cage without the tone: the tone was presented briefly, the cat was fed again, a brief tone followed, and so forth. Then the tone was switched on and sounded for a prolonged period as the cats remained in the cages and fed there. Eventually, the tone became a safety signal.

Comments on Wolpe's Experiments

The procedures Wolpe (1958) used to produce conditioned fear allowed classical conditioning to operate. However, he found that the normal extinction procedure—repeated exposure to the CS (the cage or the tone) without the UCS (the shock)—was completely ineffective; a cat would not eat in the cage after fear conditioning "though it might be left there with the food for days" (Wolpe, 1981, p. 45). The anxiety seemed to have produced a total suppression of feeding in the conditioning environment (Wolpe, 1982, 1990).

Although it seems surprising that the cats' anxiety did not extinguish after the shock was discontinued, there is a parallel in the experience of clients with phobias. After her own experience with fear conditioning, Susan B. continued to fear spiders for years, despite the fact that she had encountered them many times since the original incident without anything unpleasant happening to her (other than the anxiety itself, of course); she had certainly never again been locked in a shed. As you will see in Chapter 7, this notorious persistence of phobias led theorists to look for a second factor (in addition to classical conditioning) in explaining conditioned fear and avoidance behavior. But Wolpe, working with theories popular in the 1950s (Hull, 1952), concluded that anxiety is simply an unusual type of conditioned response that is extremely difficult to extinguish.

Reciprocal Inhibition

Because exposing the cats to the CS under conditions of extinction was not sufficient to eliminate conditioned fear, Wolpe proposed that anxiety has to be countered by a competing feeling state before it can be reduced. Accordingly, he fed the cats as part of the extinction procedure. Feeding competes with and inhibits anxiety, and anxiety competes with and inhibits feeding. He called the process *reciprocal inhibition* because the competing process goes both ways. Wolpe stated the general principle as follows: "If a response antagonistic to anxiety can be made to occur in the presence of anxiety-evoking stimuli so that it is accompanied by a complete or partial suppression of the anxiety responses, the bond between these stimuli and the anxiety responses will be weakened" (Wolpe, 1958, p. 71).

In using reciprocal inhibition to eliminate the cats' conditioned fear, Wolpe found that it did not always work simply to start feeding them inside the feared cage. Some cats first had to be taken some distance away from the cage until a point was reached at which they could be induced to eat. Interestingly, Wolpe could always find a point for each cat at which eating overcame the anxiety, and he discovered in the process that there was a linear, inverse relationship between a cat's anxiety and its distance from the cage (the further away from the cage, the less anxiety). He could therefore bring the cats gradually closer to the site of the original fear conditioning, feeding them at each step, and allowing them time to tolerate each new situation before proceeding further.

Wolpe used this combination of techniques—reciprocal inhibition at each step in a graded progression of feared stimuli—in designing behavior therapy techniques for people with various anxiety disorders. He observed that a wide variety of responses can be used to inhibit anxiety, including feeding, sexual responses, muscular relaxation, and aggression.

Treatment Procedures

Assertiveness Training

Wolpe's (1958) research with cats quickly led him to the idea of reciprocal inhibition, but it did not immediately suggest the technique of systematic desensitization for which he is best known. In first applying reciprocal inhibition to clients, Wolpe (1982) tried to encourage them to enact behavior that ran counter to the anxiety that arose in their daily lives. The most common procedure here was to encourage clients to adopt a policy of assertiveness with people. He was influenced in this by the work of Andrew Salter, who had described a general approach to treatment of neuroses ("conditioned reflex therapy") based on Pavlov's (1927) theory of personality (Salter, 1949).

Salter had assumed that people naturally tend to be "excitatory"—that is, spontaneous, outgoing, expressive, and not inhibited by worry and fear. However, many people learn to inhibit their behavior excessively because of their upbringing by strict parents and other authorities, so that neurotic behaviors emerge. Acting on this theory, Salter tried various methods for encouraging clients to be excitatory rather than inhibitory. He urged clients to express feelings and opinions spontaneously and forthrightly, to look people straight in the eye, to use the word *I* unashamedly, and so forth. Impressed by Salter's work, Wolpe initially used assertiveness training extensively with his neurotic clients. However, he soon found that "assertion toward persons" was irrelevant to many neuroses and was effective only with certain kinds of social anxiety.

Wolpe's assertiveness training technique usually involves persuading the client of the disadvantages of being nonassertive and then urging him or her to begin acting more assertively in real life. The assertive responses Wolpe recommends contain references to anger

in many cases, and he excludes expressing anxiety from his definition of assertiveness: "Assertive behavior is the socially appropriate verbal and motor expression of any emotion other than anxiety" (Wolpe, 1990, p. 135). The reciprocal inhibition process takes place in the natural environment. Because anger reciprocally inhibits anxiety, socially anxious clients are advised to start being more assertive in their everyday relationships. Expressing displeasure and annoyance would inhibit anxiety and allow its extinction to take place in real life. Hence, reciprocal inhibition takes place automatically when the client follows the therapist's directive to be more assertive.

Most of the time, instructions and coaxing to be assertive are sufficient to increase clients' assertive behavior and to reduce their social discomfort, but Wolpe also uses *behavior rehearsal* (originally called "behavioristic psychodrama") on occasion. In behavior rehearsal, the therapist and client role-play scenes from everyday life so as to help reduce the client's anxiety about forthright self-expression. When necessary, the therapist suggests more appropriate verbal responses and gives feedback on suitable gestures, eye contact, firmness of voice, and so forth (Wolpe, 1958, 1990).

Although assertiveness training was often helpful to clients with social anxiety, it was not always effective (Wolpe, 1982). Wolpe began to use Jacobson's (1938) relaxation training methods because they provided a means of reducing anxiety arising from any source. Typically beginning with 6 to 10 relaxation training sessions, Wolpe would expose clients to graduated fear stimuli in real life. When difficulties arose in arranging suitable real-life experiences, he began to deal with imagined stimuli, prompted by the work of hypnotists. This led to the development of Wolpe's best-known treatment method, systematic desensitization.

Systematic Desensitization

An informal description of *systematic desensitization*, as given by Susan, the spider-phobic client, to her friend, appears in the introduction to Section II. There are three key elements to the procedure as a behavior therapy technique: relaxation training, development of the anxiety hierarchy, and the presentation of hierarchy items for the client to imagine while deeply relaxed.

Relaxation Training

Wolpe (1958) adopted the relaxation training procedure of Edmund Jacobson (1938) as a means of inhibiting clients' anxiety during systematic desensitization. Jacobson had reported that relaxation exercises bring not only pleasant subjective feelings of calm but also many objective health benefits, especially in alleviating anxiety- and stress-related problems. One of Wolpe's most creative contributions was to incorporate relaxation methods into his experimentally derived treatment technique. Several versions of relaxation training have been described, but research has not clearly shown that any particular method is preferable (Hecker & Thorpe, 1992). One that involves teaching clients systematically to tense, then relax, various muscle groups is in common use today (Bernstein & Borkovec, 1973). The rationale for this approach is twofold: (1) it is easier to relax a muscle group from a state of tension than from a normal, resting state; and (2) alternately tensing and relaxing helps the client to learn to distinguish the sensations associated with each state.

The Anxiety Hierarchy

The anxiety hierarchy is a carefully prepared list of items, ordered along a dimension of gradually increasing anxiety-eliciting potential, representing a cross-section of the client's feared situations. A fictitious example that could apply to someone with a phobia of heights would literally consist of a series of steps. The first item, describing a situation eliciting minimal anxiety, might be "standing on the bottom rung of a step-ladder in your kitchen"; the second item might be "standing on the second rung"; and so forth. The last item, the most anxiety-evoking item in a list of 20 or so, might be "climbing to the top of a commercial radio antenna in a high wind."

In practice, few anxiety hierarchies follow such a logical, linear sequence. You might think, for example, that a test-anxious college student would experience slight fear one month before a major exam, moderate fear one week before, and extreme fear sitting in the classroom the minute before the test is handed out. The reality is often surprisingly different, so that on a genuine hierarchy, the item at the top, representing maximal anxiety, could be "studying in the dorm, the night before the test," whereas actually taking the test might be only halfway up the list.

Behavior therapists try to compile hierarchies that include the whole range of clients' fears related to a particular topic. For example, relevant dimensions of anxiety for a client with *agoraphobia*[1] could be how crowded the situation is, how far the client is from home, whether the client is alone or accompanied by a trusted companion, and whether the route away from home involves crossing bridges or passing through tunnels. To simplify hierarchy construction, clinicians usually ask the client to rate each potential item on a 0 to 100 scale of *subjective units of disturbance* (or *SUDs*). The lowest (easiest) item might receive a SUDs score of 5, and the highest 95 or 100. Typically, anxiety hierarchies have from 12 to 20 items. Susan B's anxiety hierarchy is presented as an example in Table 2–1; the hierarchy of a client with agoraphobia appears in Table 2–2.

TABLE 2–1 Sample Anxiety Hierarchy (Low to High): Phobia of Spiders

(Taken from the authors' files; the client was a 32-year-old woman. SUDs units are given in parentheses.)

1. Abbie (neighbor) tells you she saw one in her garage. (SUDs = 5)
2. Abbie sees you, crosses the street, says there's a tiny one across the street. (10)
3. Betty [at work] says there's one downstairs. (15)
4. Friends downstairs say they saw one outside their apartment and disposed of it. (20)
5. Carrie [daughter] returns from camp; says the rest-rooms were inhabited by spiders. (25)
6. You see a small, dark spot out of the corner of your eye; you have a closer look; it isn't a spider. (30)
7. You are with your husband. You see a tiny spider on a thread outside, but you can't see it very clearly. (35)
8. You are alone. You see a tiny spider on a thread outside, but you can't see it very clearly. (40)
9. You are reading the paper, and you see a cartoonist's caricature of a spider (with a human-like face and smile). (45)
10. You are reading an article about the Brown Recluse. (50)
11. You see a clear photograph of a spider's web in the newspaper. (60)
12. You see a spider's web on the stairs at work. (70)
13. You suddenly see a "loose tomato top" in your salad. (80)
14. You open a kitchen cabinet and suddenly see a large spider. (90)

TABLE 2–2 Sample Anxiety Hierarchy (Low to High): Agoraphobia

Taken from the authors' files. The client was a 51-year-old woman. SUDs units are given in parentheses.

1. Going to the local store, 50 yards away. (5)
2. Being in the butcher's shop when it's empty. (10)
3. At the beautician's. (15)
4. When walking, crossing a main road. (20)
5. In the QuickSave, pushing a shopping cart. (25)
6. At the butcher's, 1½ miles away. (35)
7. Taking a casual stroll along the main road for 15 minutes. (40)
8. Using an elevator. (45)
9. Talking to a neighbor in the street. (50)
10. Meeting a friend when walking in the street. (55)
11. In the Cooperative Store when there are about four other people there. (65)
12. In the doctor's waiting room when it's full. (75)
13. In the butcher's with five other customers. (80)
14. In a store, waiting in line. (85)
15. Walking in a large shopping mall. (90)
16. In the crowds at the town's largest shopping center on a Saturday morning. (95)

Presenting the Hierarchy Items during Treatment

After several sessions of preliminary relaxation training and construction of the anxiety hierarchy, systematic desensitization proceeds with the pairing of relaxation sensations with the items of the hierarchy. The first item, the one with the lowest SUDs rating, is described carefully by the therapist, and then the client is asked to continue to imagine it for 15 seconds or so. Two or three presentations of the item are given, separated by pauses for continued relaxation. Typically, clients use a prearranged signal, such as a slight wave of the hand, to indicate the appearance of anxiety or tension. At this signal, the therapist immediately asks the client to terminate the imagined scene, and proceeds to reinstate deep relaxation and calm before introducing the hierarchy item again. Each scene is presented several times without a signal of anxiety from the client before the next item is introduced.

Wolpe (1982) has explained that because the anxiety-countering effects of relaxation are relatively weak, only weak anxiety responses should be evoked during treatment. But repeatedly presenting a weak anxiety stimulus to a deeply relaxed client will eventually reduce its fear potential to zero, and then the next item on the hierarchy may be presented. When the anxiety associated with a hierarchy item has been weakened, the next stronger item will also have been weakened. Figure 2–2 shows Wolpe's depiction of this process. Reducing the anxiety associated with the first item, item A, from 5 to 0 simultaneously reduces the second item, B, from 10 to 5 (the shaded area disappears). It is as if the anxiety hierarchy represents a ladder, and reducing the anxiety connected with each step is like sawing the bottom rung off the ladder each time (see Figure 2–2).

Wolpe's systematic desensitization technique has clear parallels with his original research procedures. He used feeding to inhibit conditioned fear in the cats, but he uses progressive relaxation training to inhibit anxiety in his clients. With the experimental cats, he introduced them gradually to the cages in which they had been shocked, and he presented

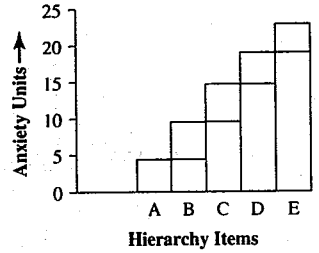

FIGURE 2–2 The Desensitization Process (When the anxiety-evoking potential of A is reduced from 5 to 0, B automatically is reduced from 10 to 5, and so forth.)

Source: From Wolpe, J., *The practice of behavior therapy*, 4th ed. Copyright © 1990 by Allyn and Bacon. Reprinted by permission.

the tone for progressively longer intervals; with his clients, he exposes them to successive items from individually tailored, graded anxiety hierarchies. The cats were exposed to actual feared situations, but the clients confront imagined scenes. As in the animal work, the clinical application of systematic desensitization involves giving the client control over the rate at which feared items are presented.

Analogue Research on Systematic Desensitization

In describing the results of "treatment on reciprocal inhibition principles" in three sets of clients, Wolpe (1958) reported a "general average of about 90% of highly favorable outcomes" (p. 216). This claim of high success rates in 210 clients with various disorders (anxiety state, hysteria, reactive depression, obsessions and compulsions, neurasthenia, and others) is particularly notable in that treatment periods were generally short as compared with traditional psychotherapy. The treatment methods used, particularly SD, were described in enough detail to allow careful replication. As a result, scores of studies of SD and other Wolpean methods have been stimulated since the original work was reported.

Initial analogue studies of SD were reported by Peter Lang and his colleagues in the early 1960s. Lang and Lazovik (1963) were the first to show that SD could effectively be implemented in a laboratory setting with snake-fearful college volunteers. The study clearly demonstrated the superiority of SD to no treatment, and it is notable in the use of a fear-relevant behavioral-avoidance test as part of the battery of outcome assessment measures. The researchers asked the volunteers to approach a live snake in a glass case, and recorded how close to the snake they could get before being stopped in their tracks by mounting

anxiety. The authors provided enough therapeutic contact to the treated subjects (14 individual sessions) to encourage confidence that the experimental procedures formed a suitable parallel to routine clinical work. A second study (Lang, Lazovik, & Reynolds, 1965) included a pseudotherapy comparison condition in addition to a no-treatment group, with the result that SD was shown to produce effects over and above those attributable to certain nonspecific therapy events.

Other studies were designed to assess not only the superiority of SD to no treatment or to treatment interviews in general but also the relative importance of procedural elements within SD. Studying snake-phobic volunteers, Davison (1968a) compared four experimental conditions: (1) SD proper, (2) SD but with hierarchy items that were irrelevant to subjects' fears, (3) SD with an appropriate hierarchy but without relaxation induction, and (4) no treatment. The results indicated that all the elements of the usual SD "package" are necessary to the procedure. However, this study may be criticized in that subjects in the no relaxation condition (3) were *yoked* to condition (1) subjects in their exposure to hierarchy items. That is, "no-relaxation" was confounded with "no control over progress through the hierarchy." Later work with snake-avoidant college students (McGlynn, 1973) and phobic clinic clients (Gillan & Rachman, 1974) produced contradictory results to those of Davison. Data showed that, while exposure to relevant stimuli is vital, the relaxation component is unnecessary. Furthermore, the data revealed that it is *not* essential to therapeutic progress for clients to control their exposure to hierarchy items by terminating scenes when anxiety arises (McGlynn, 1973).

In a landmark study, Paul (1966) provided convincing evidence of the effectiveness of SD by comparing it with traditional psychotherapy methods. The participants were drawn from a university community and had severe fears of public speaking. The therapists were experienced clinicians from the community whose orientation was psychodynamic. Paul had to teach the therapists how to implement SD, which they initially regarded as unlikely to prove helpful as treatment. Assessment measures used to assess anxiety before and after treatment consisted of an impressive battery of measures that included a behavioral test of fear (an actual speech before a group of raters), a series of self-report inventories, and physiological monitoring of pulse rate and skin conductance.

All participants received five sessions of therapy and were randomly distributed among four treatment conditions: (1) traditional insight-oriented therapy as usually practiced by the therapists; (2) SD; (3) an attention-placebo condition; and (4) no treatment. The people in the attention-placebo condition were given a pill to swallow. This was really an inert substance that they were told had impressive tranquilizing properties. Under the influence of this "drug," these participants performed a repetitive signal-detection task that was, in fact, quite dull but that they had been led to believe was highly stressful. The rationale given was that the beneficial effects of the drug during the experimental task would generalize to real-life public-speaking episodes. Post-treatment assessment revealed the short-term superiority of SD to all other methods. The results were consistent in the three behavioral domains that were assessed (self-report, overt behavioral, and psycho-physiological). A follow-up study two years later confirmed that the effects of SD were lasting and that there had been no emergence of new symptoms (Paul, 1967).

Further experimental work on SD has been devoted to assessing alternative explanations for its apparent success as a method. *Expectancy of benefit* is one such possibility, championed by Kazdin and Wilcoxon (1976). However, this is a complex issue because, despite genuine methodological problems in much desensitization research, it cannot be shown convincingly that positive expectancy of benefit actually brings about improvement in itself (McGlynn, Mealiea, & Landau, 1981). Another important matter concerns the type of participants in experimental studies of SD; findings obtained with student volunteers do not always hold in clinical samples. SD with clinic clients will be evaluated in a later chapter.

Wolpe (1982, 1990) has criticized the use of between-groups experimental designs in evaluating SD and other specific methods. Pointing out that behavioral assessment is essential to behavior therapy, he opposes arbitrarily assigning clients to one of several treatments in an experiment. In clinical work, SD or any other behavioral treatment technique is usually prescribed after a suitable assessment process with the client. Because they involve assigning participants to conditions randomly, group research designs cannot replicate the procedures of routine clinical practice: they "show statistically significant improvement in groups of patients, but leave the fate of the individual case obscure" (Wolpe, 1990, p. 345).

Aversion Therapy and Anxiety Relief

In some forms of *aversion therapy* that were popular early in the history of behavior therapy, classical conditioning procedures were used to help the client avoid situations or behavior that are closely connected with inappropriate behavior. Early examples of aversion therapy are the use of painful but harmless electric shock to discourage interest in a variety of stimuli ranging from inappropriate sexual partners (such as inanimate objects or animals) to undesired behavior, such as substance abuse or addictions. Electrical, chemical, and even imagined stimuli have been employed as unconditioned stimuli (Brownell, Hayes, & Barlow, 1978; Davison, 1968b).

In *anxiety relief*, the offset of an aversive stimulus can operate similarly to a positive stimulus. This means that if a neutral stimulus is paired with a shock being switched off, the previously neutral stimulus can become positive.

As originally described by Wolpe (1958), "anxiety-relief" was used as a treatment for anxiety in the client's day-to-day life. Some 10 to 20 times per session, the client receives an electric shock to the hand at a level that he or she has previously selected as "uncomfortable." The client is instructed to endure the shock "until the desire to have it stop becomes very strong" (Wolpe, 1958, p. 180) and then to say "Calm." At that point the therapist immediately turns off the shock. After two or three sessions, Wolpe reports, many clients can reduce spontaneous anxiety episodes by use of the word *calm*, although the results of this method apparently vary a great deal from client to client.

Thorpe, Schmidt, Brown, and Castell (1964) reported success with a variant of the method in a series of eight clients. The problems treated were phobic anxiety of clouds, elevators, and tunnels (one male client); obsessive-compulsive neurosis (one female client); compulsive overeating (one female client); and various paraphilias or unwanted sexual preferences (five male clients). These authors noted that in many published reports of behavior therapy, treatment addressed not the problem behavior itself but, rather, symbolic

representations of it (such as color slides used in aversion therapy, or imagined scenes in SD).

Accordingly, they reported the development of a technique in which printed and spoken words served to represent the problem being treated. For each client, a series of words or phrases denoting the presented problem (e.g., *fear of clouds*) was prepared. The phrases were printed on a disk that could be revolved slowly so that they appeared successively in an aperture visible to the client. As each phrase appeared, the client read it aloud and immediately received a brief, painful shock. The last word on the disk was always a relief stimulus describing the stimulus to be approached rather than avoided (e.g., *clouds*), and its presentation guaranteed that no further shocks were forthcoming. The typical duration of treatment was two weeks with daily sessions. The authors described the procedure as "extremely effective," in that the use of words in place of overt behavior within treatment sessions was successful in producing improvement in real life. However, several short-lived but unpleasant side effects were observed in the clients (depression, general anxiety, gastric ailments, and nightmares), and treatment had to be discontinued in two clients because of their dissatisfactions with the procedure.

Thorpe and associates (1964) concluded their report by remarking that reciprocal inhibition may have been involved in the therapeutic process. However, in a later process study of the components of anxiety relief, Solyom, McClure, Heseltine, Ledwidge, and Solyom (1972) were unable to rule out other factors, including the noxious stimulation itself (which could remove some of the reinforcement of being in therapy) and habituation to the phobic stimuli presented.

Exposure Methods

Beginning in the late 1960s, systematic desensitization and anxiety relief were gradually replaced by methods that encouraged clients to confront anxiety-provoking stimuli directly. Joseph Wolpe had believed that simple extinction procedures were not sufficient to eliminate phobic anxiety, citing the results of his own experiments with cats and accepting the prevailing theoretical views. But the conclusions Wolpe drew from his own experiments can be questioned. Like Masserman, Wolpe had found that his cats *could* overcome their conditioned fear simply by being made to confront the full conditioned stimuli of the cage and the tone (without any more shocks, of course). Yet instead of focusing on that finding, Wolpe paid more attention to countering anxiety by feeding the cats, and to exposing them gradually to progressively more threatening stimuli, leading him to develop the complex systematic desensitization procedure. What if this elaborate desensitization procedure were unnecessary? Research both in the animal laboratory (Wilson, 1973) and in the clinic (Marks, 1981) showed that neither reciprocal inhibition nor graduated exposure to conditioned stimuli were essential elements in the elimination of conditioned fear.

These findings converge with recent advances in theory. Instead of emphasizing the automatic conditioning of responses to stimuli by the pairing process, contemporary learning theorists stress that one learns that different classes of stimulus event are correlated. Classical conditioning therefore involves the development of *expectancies* as one learns

that the CS predicts a particular UCS (Rescorla, 1988; Thompson, 1994; Wilson, 1995). Eliminating the unnecessary anxiety evoked by a CS means altering the client's expectation that an aversive UCS will follow. As we shall show next, straightforward exposure to the relevant stimuli is the essential technique.

There are several possible procedures for exposing clients to phobic stimuli in a therapeutic way, but the essential dimensions that have been studied are (1) protective versus confrontive and (2) imaginal versus real-life (or *in vivo*) exposure. Figure 2–3 illustrates how those two dimensions of exposure can classify the anxiety-reduction techniques described in this chapter.

Graduated Real-life Practice

Behavioral treatment of many anxiety-related disorders includes some form of *exposure* to feared stimuli. In SD, the exposure is to imagined, not real-life, stimuli, and it is protective because the challenging stimuli are introduced gradually while anxiety is deliberately kept low by deep muscle relaxation (see the upper left corner of Figure 2–3). In *graduated real-life practice*, sometimes referred to as "graded practice" or "successive approximation," clients face actual feared stimuli without relaxation but following a graded hierarchy. Introducing the stimuli gradually constitutes a protective, rather than a confrontive, form of exposure (see the lower left corner of Figure 2–3). As in SD, the client may withdraw from a situation at any point if the anxiety exceeds a minimal level.

Susan, the spider-phobic client who was described in the introduction to Section II and earlier in this chapter, was treated partly by systematic desensitization and partly by graduated real-life practice. In her case, treatment proceeded fairly rapidly, and she needed only three real-life practice sessions. In the first of these, she was able to travel the length of a long corridor toward the tiny, dead spider in a glass jar, only balking at the last few feet. In the second session, she was able to touch the glass jar, and in the third, she could hold the spider in her hand. A few days later, she noticed a live spider in her car as she was driving, and she brushed it away without thinking. A few seconds later, with a sudden shock of realization, she was struck by the certain knowledge that she had finally overcome her phobia.

	Protective	Confrontive
Imaginal	Systematic Desensitization	Implosive Therapy Imaginal Flooding
In Vivo	Graduated Real-Life Practice	Exposure In Vivo

FIGURE 2–3 Dimensions of Exposure (The four combinations of protective versus confrontive and imaginal versus real-life exposure, and their corresponding treatment techniques.)

Graduated real-life practice was one of the earliest behavioral techniques to be used in Britain. In an early report of behavior therapy with two phobic clients, Meyer (1957) described the successful treatment of agoraphobic symptoms by applying the "experimental method and learning principles." Referring to the earlier case report of H. G. Jones (1956; see Chapter 1), Meyer argued that his demonstration was similar but paid more attention to individual differences in personality structure. The theoretical rationale was as follows. Clients with phobias display such intense anxiety in the feared situation that they are not amenable to therapy. According to the principle of stimulus generalization, however, if a stimulus is presented that resembles the phobic stimulus but evokes less anxiety, the therapist can attempt to substitute an "adaptive" reaction for the unadaptive one. Next, the client can learn to deal with a graded continuum of similar situations.

The clients were both in their forties, a man and a woman. Both had complained of blackouts and had been suspected of suffering from temporal lobe epilepsy. They avoided situations involving crowds, travel, and being confined. The female client had five sessions of graduated real-life practice. The therapist accompanied her on various outings in central London, taking bus rides, entering crowded stores, traveling on the subway, using elevators, and so forth. She responded well to the procedure and she had maintained her improvement four months later when reinterviewed. The male client had had more generalized fears than the woman. Systematic desensitization was not helpful to him because he could not produce anxiety in response to the hierarchy items. Meyer used anxiety relief instead, applying electric shock to the client's fingers and terminating the shock when it became unbearable and the client said "Calm yourself." Treatment sessions were divided between aversion relief in the office and graduated real-life practice. Initially the results were not impressive, so the therapist administered a stimulant drug to aid conditioning; after that, clear therapeutic gains were made.

Confrontive Exposure: Implosive Therapy, Imaginal Flooding, and Exposure In Vivo

SD and graduated real-life practice involve dealing with anxiety-evoking stimuli cautiously, one step at a time. Like entering a cold swimming pool by hesitantly going down the steps at the shallow end, these protective methods take time—and the caution may be unnecessary. The procedures to be described next are the behavior therapy equivalent of diving in at the deep end.

Confrontive exposure (sometimes called *flooding*, making the swimming pool analogy quite appropriate) may involve imagined or real situations (see the right-hand boxes in Figure 2–3). As Marks (1972) described it:

> *Flooding is not a fixed technique but comprises a wide range of overlapping allied procedures. Common to all the methods is the principle of confronting [clients] with the stimuli that distress [them] until [they] get used to them and/or the evoking of intense emotion during treatment. The term flooding is best restricted to those forms of confrontation that evoke intense emotion. (p. 129)*

The first confrontive exposure technique of this kind was the *implosive therapy* of Stampfl and Levis (1967), using imagined stimuli. These authors expressed regret that

learning-oriented therapies had been developed entirely independently of the traditional psychodynamic approaches and argued that a suitable integration could be made. After a review of the laboratory evidence on fear conditioning, Stampfl and Levis speculated that not only external stimuli but also thoughts and imagery connected with painful experiences would be avoided. Any "defensive maneuvers" of the client that successfully avoid such thoughts or images could be strengthened by reinforcement principles. To Stampfl and Levis, this view admits psychoanalytic concepts of repression and the like into a learning account of psychopathology. Arguing that experimental extinction is the appropriate therapeutic principle in the treatment of neuroses, they predicted that extinction would be most effective when the subject is exposed to the original conditioning situation that elicits the greatest fear.

Boudewyns and Shipley (1983) noted that clinicians and theorists wrongly rejected confrontive exposure methods for years, uncritically accepting a series of false assumptions. These include Wolpe's (1958) concern that unprotected exposure to feared stimuli risks "resensitizing" the client. That concern arose partly from the results of studies of shock avoidance in dogs by Solomon and his colleagues (Solomon, Kamin, & Wynne, 1953; Solomon & Wynne, 1954). The dogs' behavior had failed to extinguish after many trials, leading the researchers to conclude that anxiety-motivated avoidance was extremely resistant to extinction if not entirely unmodifiable. The later work of Morrie Baum (1970) showed that the apparent irreversibility of conditioned avoidance is a myth. Abandoning the misleading assumptions of Wolpe and others led to the development of "direct therapeutic exposure," defined by Boudewyns and Shipley (1983) as "repeated or extended exposure, either in reality or in fantasy, to objectively harmless, but feared, stimuli for the purpose of reducing negative affect" (p. 3).

The implosive therapy technique of Stampfl and Levis (1967) involves prolonged confrontation by the client of relevant fantasy material. The therapist describes scenes that contain the appropriate fear cues in such an involved and dramatic way as to arouse great anxiety. When a sufficiently high level of anxiety has been provoked in the client, the therapist continues to describe the material until the anxiety decreases. The therapist repeats the procedure, introducing variations in the material described as necessary to continue to evoke anxiety. The session is not ended until there is a significant reduction of anxiety in response to the material. In presenting fantasy material the therapist is guided by an "avoidance serial cue hierarchy" derived from the client's current concerns and presented problems, together with issues prompted by a psychodynamic formulation of the client's case. Apart from including psychodynamic theme material, implosive therapy closely parallels the "forced solution" that Wolpe had used with his cats (the "blocking procedure"; Baum, 1970) in that

> *the therapist forces [clients] to be exposed to some of the anxiety-provoking cues that [they] partially avoid ... outside of the treatment session by means of [the] symptom. Therefore, with the avoidance response circumvented, greater exposure to the cues will occur, and subsequently greater extinction will be effected. (Stampfl & Levis, 1967, p. 501)*

The authors describe implosive therapy as having proven successful or at least shown promise in the treatment of neurotic, psychotic, and personality disorders. A typical course

of treatment lasts from one to 15 sessions, and it is unusual for therapy to proceed beyond 30 hours of active treatment.

Since the Stampfl and Levis (1967) report appeared, a great deal of research on confrontive exposure methods has been reported (Marks, 1972, 1981a, 1981b, 1987). In methods using fantasy material, the psychodynamic themes have been abandoned by most researchers. The term *imaginal flooding* is commonly used to describe prolonged exposure to relevant fantasy material without psychodynamic content. Implosive therapy and imaginal flooding involve confrontive, imaginal exposure, as indicated in the upper right corner of Figure 2–3.

The remaining combination of procedures, confrontive exposure in vivo (in real life), has been labeled *exposure in vivo* (see the lower right corner of Figure 2–3). Isaac Marks (1981b) has conducted a long series of studies of confrontive real-life exposure in the treatment of phobias and obsessive-compulsive disorder. Not convinced that conditioning explanations of phobias have been scientifically proven, Marks has promoted exposure in vivo as an empirical clinical method that may rest on any of several theoretical processes: extinction, habituation, or other forms of acclimatization to originally feared stimuli. Because it is not proven that anxiety disorders are caused by conditioning, Marks prefers to avoid terms such as *conditioned stimuli* and *extinction*. Instead, he describes the feared situation as an *evoking stimulus (ES)* and the behavior that it calls forth, such as phobic avoidance or compulsive rituals, as the *evoked response (ER)*. The task of the therapist is to identify the ES and present it until the ER is reduced. Experimental work addresses the important parameters of the procedure, such as imaginal versus in vivo stimulus confrontation, brief or prolonged exposure sessions, and so forth.

Not all forms of exposure to the ES will be therapeutic (or lead to response decrement). Research results to date suggest that stronger evoking stimuli require more prolonged exposure sessions before anxiety declines. Reiss (1980) has illustrated this by showing the relationship between stimulus intensity and stimulus duration in determining whether exposure will be desensitizing (helpful and therapeutic) or sensitizing (risking increasing the anxiety) (see Figure 2–4). For example, suppose that spider-phobic Susan had been treated by exposure in vivo instead of by SD and graduated real-life practice. She would have confronted large, live, threatening spiders in the very first session, and her therapist would have strongly urged her to stay in contact with them despite her high anxiety. If Susan could have held her ground for a prolonged period (say an hour or more), it is quite possible that she would have reduced her anxiety significantly and in a lasting way in that very first session. But, if she had fled in terror within the first two minutes, it is unlikely that this high level of exposure for such a brief period would have resulted in her anxiety being reduced—in fact, it could have increased.

Figure 2–4 shows the relationship of *CS duration* (how long Susan remains in contact with the spider) to *CS intensity* (how much anxiety the spiders evoke). Duration is on the upright axis, intensity on the horizontal. If the intensity is low (tiny, dead spider in a sealed jar 20 feet away; left side of the graph, at intensity 1), then even a fairly short exposure of a few minutes (low down on the graph, at duration 1) may be enough to reduce Susan's anxiety. But the same exposure time (duration 1) would *not* be sufficient to allow anxiety reduction if the stimulus intensity were high (large, live, active spiders, 2 inches away; right side of the graph, intensity 2). The graph shows this by indicating that any combination of duration and intensity that falls below the diagonal line will lead to *increased* anxiety, whereas any combination above that line will be therapeutic and lead to *decreased* anxiety. Intensely anxiety-provoking stimuli can be presented in a therapeutic way, provided that the duration of exposure exceeds a certain minimum time interval (intensity 2, duration 2, for example).

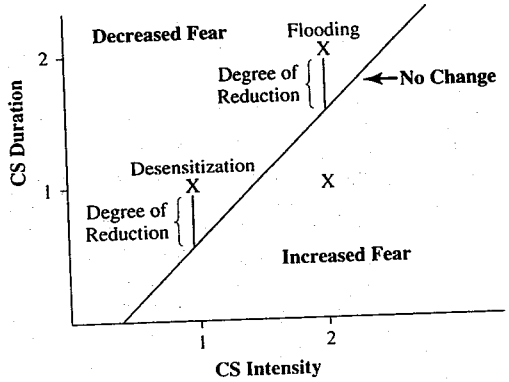

FIGURE 2–4 Theoretical Effect of Different Durations and Intensities of Conditioned Stimulus Exposure on Anxiety Expectancies

Source: From Reiss, S., Pavlovian conditioning and human fear: An expectancy model. *Behavior Therapy, 11*, 380–396. Copyright © 1980 by the Association for Advancement of Behavior Therapy. Reprinted by permission of the publisher and the author.

The protective exposure methods (SD, graduated real-life practice) lead to improvement even with brief stimulus presentations, because they evoke only weak anxiety. The confrontive exposure methods (imaginal flooding, exposure in vivo) are effective also, despite their use of stimuli that evoke intense anxiety, because exposure is prolonged.

Chapter Summary

Behavior therapy techniques used in the treatment of anxiety-related disorders were originally stimulated by principles of classical conditioning and by experimental neurosis phenomena. Research findings and theoretical developments have improved the practice of behavior therapy and modified its techniques. It was commonplace in the 1960s for behavior therapists to use systematic desensitization, aversion therapy, and anxiety relief with outpatient clients. Today, however, these methods are rarely reported and they have been supplanted by graduated real-life practice, imaginal flooding, and exposure in vivo.

Endnotes

1. "Susan," whose phobia is described more fully later in the chapter, is a composite of three clients treated by one of the authors in the last several years. Each incident described is true to life in having been drawn from the experiences of these three individuals.
2. The terms *anxiety* and *fear*, used extensively in this chapter, have been defined as follows: "*Fear* is the usually unpleasant feeling that arises as a normal response to realistic danger. *Anxiety* is an emotion similar to fear, but arising without any objective source of danger" (Marks, 1987, p. 5).
3. We consider the term *conditioned fear* to be equivalent to the term *anxiety*.
4. Agoraphobia—an anxiety disorder in which the client tends to experience panic attacks and to avoid crowds, public places, and traveling far from home—is considered in detail in Chapter 7.

Chapter 3

Operant Learning Principles and Behavior Management Procedures

Harold was a single man in his forties who had spent over 20 years as a patient in a county psychiatric hospital. At the time of his admission for treatment, Harold's problems had been labeled as *manic-depressive psychosis*, but a sad combination of lack of social support in his community and less than progressive discharge policies at the hospital left him still on the ward long after his original problems had been resolved. In common with many other patients on his ward, Harold suffered mostly from apathy, having grown accustomed to the hospital's monotonous routines. He was not entirely withdrawn, however. He often conversed with the ward staff in quite an animated manner, usually dwelling on his favorite theme—his belief that he had an undiagnosed physical illness that gave him frequent seizure-like falling spells.

Although the hospital's efforts at discharging patients left much to be desired, the medical care was excellent, because the psychiatric hospital was allied with a general hospital located on the same grounds. Extensive medical evaluations had failed to identify any sign of physical illness for Harold, yet several times a week—always with several witnesses—he would suddenly collapse gracefully to the floor, remaining supine as the staff members and other patients came running to attend to him. Although the medical staff refused to call these episodes "fainting spells" (because they were not fainting spells), the label stuck, and Harold became known as "the fainter."

His habit of collapsing to the floor so often was the chief problem keeping him in the hospital. Previous attempts to discharge him to the community had always been defeated, because—usually on the same day of his discharge—Harold